# CLEARWATER PROGRAM

## Environmental Impact Report/ Environmental Impact Statement Appendices *FINAL*

SCH# 2008101074

**November 2012**

U.S. Army Corps of Engineers

SANITATION DISTRICTS OF LOS ANGELES COUNTY

ICF INTERNATIONAL

# CLEARWATER PROGRAM

## Environmental Impact Report/ Environmental Impact Statement Appendices

## *FINAL*

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*Also Available at:*

**www.ClearwaterProgram.org**

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## Appendix 1-A
# PRELIMINARY SCREENING ANALYSIS

# PRELIMINARY SCREENING ANALYSIS FOR THE **CLEARWATER PROGRAM**

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# ABBREVIATIONS

| | |
|---|---|
| ASBS | areas of special biological significance |
| Basin Plan | Los Angeles RWQCB Basin Plan |
| BMPs | best management practices |
| Cal/OSHA | California Division of Occupational Safety and Health |
| CalARP | California Accidental Release Program |
| CalEPA | California Environmental Protection Agency |
| Caltrans | California Department of Transportation |
| CAO | Cease and Abate Order |
| CDO | Cease and Desist Order |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CNDDB | California Natural Diversity Database |
| CNPS | California Native Plant Society |
| Corps | U.S. Army Corps of Engineers |
| CWC | California Water Code |
| dBA | A-scale decibels |
| DOT | Department of Transportation |
| EFH | essential fish habitat |
| EIR | environmental impact report |
| EIR/EIS | Environmental Impact Report/Environmental Impact Statement |
| EIS | environmental impact statement |
| EPA | U.S. Environmental Protection Agency |
| FMP | Pacific Coast Groundfish Fishery Management Plan |
| FORCO | Fletcher Oil and Refining Company |
| FTA | Federal Transit Administration |
| GPM | gallons per minute |
| HCP | habitat conservation plan |
| HMI | hazardous materials inventory |
| I- | Interstate |
| IPS | inches per second |
| JO | Joint Outfall |
| JOD | Joint Outfall Districts |
| JOS | Joint Outfall System |
| JWPCP | Joint Water Pollution Control Plant |
| LAXT | Los Angeles Export Terminal |

| | |
|---|---|
| LBWRP | Long Beach Water Reclamation Plant |
| LCWRP | Los Coyotes Water Reclamation Plant |
| LUSTs | leaking underground storage tanks |
| MGD | million gallons per day |
| MRZ | Mineral Resource Zones |
| MSA | Magnuson-Stevens Fishery Conservation and Management Act |
| NCCP | natural community conservation plan |
| NFPA | National Fire Protection Association |
| NPDES | National Pollutant Discharge Elimination System |
| Ocean Plan | California Ocean Plan |
| PCBs | polychlorinated biphenyls |
| Port Master Plan | Community Plan for the Port |
| POWRP | Pomona Water Reclamation Plant |
| PPV | peak particle velocity |
| PV Shelf | Palos Verdes Shelf |
| RCRA | Resource Conservation and Recovery Act |
| RMP | Risk Management Plan |
| RWQCB | regional water quality control board |
| Sanitation Districts | Sanitation Districts of Los Angeles County |
| SCAG | Southern California Association of Governments |
| SEA | Significant Ecological Area |
| SJCWRP | San Jose Creek Water Reclamation Plant |
| SP Shelf | San Pedro Shelf |
| SR- | State Route |
| State Route 1 | Pacific Coast Highway |
| SWPPP | stormwater pollution prevention plan |
| SWRCB | State Water Resources Control Board |
| TBM | tunnel boring machine |
| TraPac | Trans Pacific Container Service Corporation |
| USGS | U.S. Geological Survey |
| WNWRP | Whittier Narrows Water Reclamation Plant |
| WRPs | water reclamation plants |

# Chapter 1
# CLEARWATER PROGRAM PRELIMINARY SCREENING ANALYSIS

## 1.1 Introduction

This Preliminary Screening Analysis has been prepared for the Sanitation Districts of Los Angeles County (Sanitation Districts) and the U.S. Army Corps of Engineers (Corps) to provide a preliminary environmental evaluation of the Clearwater Program. The Sanitation Districts and the Corps have determined that an environmental impact report (EIR) and environmental impact statement (EIS) will be prepared for the Clearwater Program, which will address the potentially significant impacts identified within this document. The Preliminary Screening Analysis was used to screen issues determined to have no impact or less than significant impact from further analysis in the EIR and the EIS and to provide public disclosure for the rationale for these determinations. The Preliminary Screening Analysis includes a project description, an evaluation of environmental impacts, and a list of references.

### 1.1.1 Regulatory Guidance

This Preliminary Screening Analysis follows the methods and format proposed in Appendix G of the State CEQA Guidelines (State of California Natural Resources Agency 2010), the City of Los Angeles CEQA Guidelines (2006), and the Sanitation Districts' thresholds, and it relies on expert opinion based on facts, technical studies, and other substantial evidence to document its findings. The Corps has generally adopted the CEQA thresholds for the purposes of the Clearwater Program NEPA analysis.

### 1.1.2 CEQA Lead Agency Contact

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# Chapter 2
# PROJECT DESCRIPTION

## 2.1 Project Description

### 2.1.1 Sanitation Districts of Los Angeles County

The Sanitation Districts serve the regional wastewater and solid waste management needs of approximately 5.4 million people in Los Angeles County. The Sanitation Districts' service area covers approximately 820 square miles and encompasses 78 cities and unincorporated territory within the county. The 23 separate districts that comprise the Sanitation Districts work cooperatively under a Joint Administration Agreement with one administrative staff headquartered near the city of Whittier. The individual districts operate and maintain their own portions of the collection system. Of the 23 districts, 17 are collectively known as the Joint Outfall Districts (JOD). The JOD has a population of 4.8 million people and is served by the Joint Outfall System (JOS).

The JOS is a regional interconnected system of wastewater conveyance, treatment, and disposal facilities that serve 73 cities and some unincorporated areas (approximately 640 square miles). The JOS provides wastewater conveyance and treatment, water reuse, and effluent disposal for residential, commercial, and industrial wastewater users within the jurisdictions of the 17 participating districts of the JOD.

### 2.1.2 Program Location and Setting

The JOS is located in the central, southern, and eastern portions of Los Angeles County extending from the San Gabriel Mountain foothills south to the Palos Verdes Peninsula and San Pedro Bay, and from San Bernardino and Orange Counties west to the cities of Glendale and Los Angeles and to Santa Monica Bay.

There are three major rivers in the JOS service area: the Rio Hondo, Los Angeles, and San Gabriel. Major creeks include San Jose and Coyote. The Rio Hondo flows southwest from its headwaters at Sawpit Dam into the Los Angeles River, which discharges into the Pacific Ocean. Upstream, the Rio Hondo receives tertiary treated effluent discharges from the Sanitation District water reclamation plants (WRPs). The San Gabriel River flows southwesterly from its headwaters in the San Gabriel Mountains and forms a tidal prism before discharging into the Pacific Ocean at Seal Beach. The tidal prism of the San Gabriel River is the area within the river where there is a mixing of freshwater from upstream rain water, tertiary treated effluent, and other freshwater sources, and salt water from the Pacific Ocean.

There are two major spreading grounds in the JOS for recharging groundwater into the Los Angeles area groundwater basins. One spreading ground is located on the Rio Hondo River at the Rio Hondo Spreading Grounds in the city of Montebello. The other is located on the San Gabriel River at the San Gabriel Coastal Spreading Grounds in the city of Pico Rivera. These spreading grounds use Sanitation Districts' tertiary treated effluent, water imported from the State Water Project, and rain water to recharge the groundwater basin through percolation. In addition to the spreading grounds beneficially reusing tertiary treated water, there are three saltwater barrier projects in the Los Angeles area that further treat

and pump the recycled water into the ground to prevent the intrusion of saltwater into the groundwater basins.

Five of the upstream WRPs are permitted to discharge tertiary treated effluent into the receiving water bodies discussed in this section. The San Jose Creek Water Reclamation Plant (SJCWRP), located in an unincorporated area of Los Angeles next to the city of Whittier, discharges into San Jose Creek and the San Gabriel River. The Pomona Water Reclamation Plant (POWRP), located in the city of Pomona, discharges into the south fork of the San Jose Creek. The Los Coyotes Water Reclamation Plant (LCWRP), located in the city of Cerritos, discharges into the San Gabriel River. The Long Beach Water Reclamation Plant (LBWRP), located in the city of Long Beach, discharges into Coyote Creek. In addition, a portion of the recycled water undergoes advanced treatment at the Water Replenishment District of Southern California's Advanced Water Treatment Facility and is injected into the ground at the Alamitos Seawater Barrier Project to prevent saltwater intrusion into the freshwater aquifer. The Whittier Narrows Water Reclamation Plant (WNWRP), located in the city of South El Monte, discharges into the Rio Hondo, the Rio Hondo Spreading Grounds, and the San Gabriel Coastal Spreading Grounds. The La Cañada Water Reclamation Plant (LACAWRP), located in the city of La Cañada Flintridge, discharges recycled water into irrigation system storage impoundments at a nearby golf course. The final destination for recycled water that is not beneficially reused is the Pacific Ocean, where the Los Angeles and San Gabriel Rivers outlet in the Port of Los Angeles and Seal Beach, respectively.

Solids generated at the six upstream WRPs, as a byproduct of the treatment processes, are returned back to the JOS conveyance system for consolidated solids processing at the Joint Water Pollution Control Plant (JWPCP) in the city of Carson. This conveyance system is a network of variously sized subterranean sewers. This network converges into nine main Joint Outfall (JO) trunk sewers that deliver wastewater to the six upstream WRPs and the JWPCP. The JWPCP is located on approximately 400 acres bordered by West Sepulveda Boulevard to the north, Main Street to the east, West Lomita Boulevard to the south, and the Interstate (I-) 110 to the west. Activities at the JWPCP include wastewater treatment, as well as solids processing and biosolids management for the entire JOS. After processing, the biosolids are transported from the JWPCP, via trucks, to various biosolids management facilities for beneficial use or for landfill co-disposal within California and Arizona.

The wastewater, after being treated to a secondary level at the JWPCP, is conveyed in two tunnels to Royal Palms Beach where the tunnels converge into a subterranean manifold structure. The manifold structure connects the tunnels to the offshore ocean outfalls. Outfalls are seafloor pipelines that extend from the shore to the diffuser area. Diffusers are also seafloor pipelines, but have holes that allow for the release of the secondary treated effluent into the ocean. There are four outfalls, but only two operate on a regular basis. These outfalls are located to the south of the terrestrial Palos Verdes Peninsula on an ocean formation known as the Palos Verdes Shelf (PV Shelf).

## 2.1.3 Clearwater Program Objectives

The Clearwater Program is necessary to ensure adequate JOS wastewater system capacity and reliability through the year 2050. Specifically, the following objectives were identified in the Master Facilities Plan (MFP) and are the California Environmental Quality Act (CEQA) objectives:

- Provide adequate system capacity to meet the needs of the growing population
- Provide overall system reliability by allowing the inspection, maintenance, repair, and replacement of aging infrastructure

- Provide support for emerging recycled water reuse and biosolids beneficial use opportunities
- Provide a long-term solution for meeting water quality requirements set forth by regulatory agencies

## 2.1.4 Program and Project Elements

### 2.1.4.1 Program Elements

As a result of the Clearwater Program planning effort, system-wide improvements were identified in the MFP and will be evaluated at either a program or project level. Seven program elements, with associated facilities, within the JOS will be analyzed at the program level. The program elements include:

- Conveyance improvements
- Plant expansion
- Process optimization
- WRP effluent management
- Solids processing
- Biosolids management
- JWPCP effluent management

The program elements were organized by facility/location for analysis. The facilities associated with the program elements and their locations and proposed modifications are shown in Table 2-1. Also refer to Table 3-2 in Chapter 3 of the Clearwater Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for a summary of program elements.

## Table 2-1. Program-Level Facilities and Proposed Actions

| Existing Facilities | Existing Location | Program Element | Proposed Action(s) for Each Program Element |
|---|---|---|---|
| Conveyance System | | | |
| JO Trunk Sewers | Located between 5 and 25 feet bgs generally in public rights-of-way of existing streets throughout the entire JOS service area. | Conveyance Improvements | Relief to approximately 33 miles of JO trunk sewers throughout JOS service area (identified in Figure 3-4 in Chapter 3 of the EIR/EIS). |
| Water Reclamation Plants | | | |
| SJCWRP | Located at 1965 Workman Mill Road. Site is 51 acres within unincorporated Los Angeles County, near the city of Whittier. The site is bounded by San Jose Creek to the north, State Route (SR-) 60 to the south, Workman Mill Road to the east, and the San Gabriel River to the west. | Plant Expansion | Expansion of SJCWRP by 25 MGD; total permitted capacity would increase from 100 MGD to 125 MGD. Expansion would be located adjacent to the San Gabriel River where existing treatment facilities are currently located. |
| | | Process Optimization | Process optimization would be located at existing parking lot and existing maintained lawn area adjacent to San Jose Creek. |
| | | WRP Effluent Management | Discharge would potentially range from a 69 MGD decrease to an 8 MGD increase. Other reuses would potentially range from a 45 to 94 MGD increase. Discharge would continue from existing discharge point(s) into unlined portions of San Jose Creek and the San Gabriel River and into the lined portion of the San Gabriel River. |
| POWRP | The POWRP is located at 295 Humane Way on a 14-acre site in the city of Pomona. The POWRP is bounded by a railroad right-of-way and industrial uses to the north, the Humane Society and Humane Way to the east, and Elephant Hill to the west. | Process Optimization | Process optimization within the existing WRP footprint on existing vacant/disturbed land. |
| | | WRP Effluent Management | Discharges for groundwater replenishment would potentially increase by 1 to 2 MGD. Other reuses would potentially increase by 5 to 7 MGD. Discharge would continue at existing discharge point(s) into unlined portions of San Jose Creek. |
| LCWRP | Located at 16515 Piuma Avenue on a 34-acre site within the city of Cerritos. The treatment facilities occupy the lower southwest corner of the site. The remaining 20 acres are occupied by the Iron-Wood Nine Golf Course. The LCWRP is bounded to the north by Southern California Edison property, to the south by SR-91, to the east by I-605, and to the west by the San Gabriel River. | Process Optimization | Process optimization within the existing WRP footprint on the Iron-Wood Nine driving range. |

**Table 2-1 (Continued)**

| Existing Facilities | Existing Location | Program Element | Proposed Action(s) for Each Program Element |
|---|---|---|---|
| | | WRP Effluent Management | Reuse would potentially increase by 3 to 22 MGD. Discharge would be similar to the current range of discharges. Discharge would continue at existing discharge point(s) into lined portions of the San Gabriel River. |
| LBWRP | Located at 7400 E. Willow Street on a 17-acre site in the city of Long Beach. The LBWRP is bounded by Willow Street to the north, Coyote Creek to the south and east, and the San Gabriel River to the west. | Process Optimization | Process optimization within the existing WRP footprint on vacant disturbed land. |
| | | WRP Effluent Management | Reuse would potentially increase by 4 to 10 MGD. Discharge would be similar to the current range of discharges. Discharge would continue at existing discharge point(s) into lined portions of Coyote Creek. |
| WNWRP | The WNWRP is located at 301 N. Rosemead Boulevard on a 27-acre site near the city of South El Monte. The WNWRP is surrounded by the Whittier Narrows Recreational Area to the north, undeveloped industrial areas to the south, Legg Lake and nurseries to the east, and largely unused utility areas to the west. | WRP Effluent Management | Discharges for groundwater replenishment would potentially increase by 4 MGD. Other reuses would potentially increase by 4 MGD. Discharge would continue at existing discharge point(s) into unlined portions of the Rio Hondo. |
| JWPCP | | | |
| JWPCP | City of Carson | Solids Processing | Would continue to process solids in accordance with existing practices. Six new anaerobic digesters would be constructed and operated within the JWPCP footprint and replacement of existing facilities may occur due to aging. |
| JWPCP and throughout California | City of Carson and throughout California | Biosolids Management | Approximately 1,850 wet tons of biosolids will be generated by 2050. This would result in an increase of 20 truck trips required for transport of biosolids to biosolids management facilities. The current practice of transporting biosolids from JWPCP to biosolids management facilities within California and Arizona would continue. |
| JWPCP and Ocean Discharge System | See Table 2-2. | JWPCP Effluent Management | To be further evaluated at the project level. |

bgs = below ground surface
MGD = million gallons per day

The program includes relief to approximately 33 miles of JO trunk sewer lines. Relief would include the replacement of current pipes with larger diameter pipes or the addition of new pipes or parallel pipes. It is assumed all 33 miles would include additional new pipes, and there would be some unknown length of existing pipes that would be maintained or fixed (i.e., rehabilitated).

The program includes expansion and process optimization to meet a treatment capacity shortfall and to ensure the WRPs will continue to meet discharge limits. This would include a 25 million gallons per day (MGD) expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP. All construction associated with the expansion at the SJCWRP and process optimization at the WRPs would be done within the footprint of the existing WRP facilities (see Figures 3-5, 3-6, 3-7, and 3-8 in Chapter 3 of the EIR/EIS). Process optimization would include the construction of large underground wastewater storage tanks at each WRP. Once constructed, the tank would store wastewater during peak flows periods and be released during low flow periods to maximize the efficiency of the wastewater treatment process.

The program would also include WRP effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP. The management of the effluent would depend on demand for recycled water, as described in Table 2-1. Therefore, the program includes some increases and decreases in recycled water discharged into the receiving water bodies at each of the aforementioned WRPs.

As there would be no program construction or operation activities at the LACWRP, this WRP is not analyzed or further discussed in this document.

Centralized solids processing would continue at the JWPCP in accordance with existing practices. Approximately six new anaerobic digesters would be added to stabilize sludge and meet future generation rates. These digesters would be constructed within the existing footprint of the JWPCP facility (see Figure 3-9 in Chapter 3 of the EIR/EIS). Some additional solids processing equipment may need to be replaced due to aging. This equipment would be located within the JWPCP, in the same general vicinity that the current solids processing equipment is located.

Biosolids management at the JWPCP would continue to use some of the locations the Sanitation Districts currently use for beneficial use. There would be an increase in the biosolids transported from the JWPCP to the beneficial use locations. Truck trips would increase by approximately 20 trips per day. There are eight potential new locations for beneficial use of biosolids management. These are located between 60 and 300 miles from the JWPCP in Kings, Kern, Yuma, San Bernardino, and Riverside Counties (refer to Figure 3-10 in Chapter 3 of the EIR/EIS for locations of the anticipated biosolids beneficial use locations and Table 3-7 in Chapter 3 for a list of the facilities and their locations and distances from the JWPCP).

### 2.1.4.2 Project Elements

A major component of the MFP will be to evaluate, at a project level, the possible construction of a new or modified ocean discharge system and the rehabilitation of the existing ocean outfalls. This project would discharge secondary treated effluent from the JWPCP to either the SP Shelf or PV Shelf, through a new offshore tunnel or the existing ocean outfalls. The project has three functional categories (1) tunnel alignment (onshore and offshore), (2) shaft site, and (3) riser and diffuser area. The project elements, organized by functional category, are described in Table 2-2.

**Table 2-2. Location of Project Elements**

| Project Element | Jurisdiction | Location |
|---|---|---|
| Tunnel Alignments | | |
| Wilmington to SP Shelf | City of Carson<br>Community of Wilmington, City of Los Angeles<br>Port of Los Angeles/State of California | Onshore approximately 100 to 200 feet bgs extending approximately 10,700 feet following Wilmington Boulevard south to Port of Los Angeles.<br>Offshore approximately 100 to 200 feet bgs or below the seafloor starting at Port of Los Angeles extending approximately 65,200 feet southeast to LAXT and to the SP Shelf. |
| Wilmington to PV Shelf | City of Carson<br>Community of Wilmington, City of Los Angeles<br>Port of Los Angeles/State of California | Onshore is same as Wilmington Boulevard to SP Shelf Alignment.<br>Offshore approximately 100 to 250 feet bgs or below the seafloor, starting at the Port of Los Angeles and extending 38,100 feet to the PV Shelf. |
| Figueroa/Gaffey to PV Shelf | City of Carson<br>Community of Wilmington, City of Los Angeles<br>Community of San Pedro, City of Los Angeles<br>State of California | Onshore approximately 70 to 370 feet bgs following Figueroa Street south, to John S. Gibson Boulevard, south to Gaffey Street extending 34,000 feet.<br>Offshore approximately 100 to 250 feet below the seafloor extending from Angels Gate 11,400 feet to the PV Shelf. |
| Figueroa/Western to Royal Palms | City of Carson<br>Community of Wilmington, City of Los Angeles<br>Community of San Pedro, City of Los Angeles | Onshore approximately 70 to 450 feet bgs following Figueroa Street, southwest under Harbor Regional Park, south on North Gaffey, West on Capitol Drive, south on Western Avenue.<br>There would be no offshore tunnel; rehabilitation would occur to the existing ocean outfalls, as under all the alternatives. |
| Shaft Sites | | |
| JWPCP West | City of Los Angeles | Southeast corner of West Lomita Boulevard and Figueroa Street |
| JWPCP East | City of Carson | Northwest corner of West Lomita Boulevard and Main Street |
| TraPac | Port of Los Angeles | Located at the TraPac container terminal approximately Wilmington Boulevard and Harry Bridges Boulevard |
| LAXT | Port of Los Angeles | Terminal Island, northeast corner of Ferry Street and Terminal Way |
| Southwest Marine | Port of Los Angeles | Terminal Island, east of Southwest Marine Warehouses |
| Angels Gate | Community of San Pedro, City of Los Angeles | Northwest of South Gaffey Street and West Paseo Del Mar, immediately north of Paseo Del Mar |
| Royal Palms | Community of San Pedro, City of Los Angeles | Mostly within Sanitation Districts' property at Royal Palms Beach near the beach access road, Kay Fiorentino Drive. |
| Riser/Diffuser Area | | |
| SP Shelf | State of California; federal past 3 nautical miles | SP Shelf in the Pacific Ocean |
| PV Shelf | State of California | PV Shelf in the Pacific Ocean |
| Existing Ocean Outfalls | State of California | Existing ocean outfalls located on the PV Shelf in the Pacific Ocean |

The program and project elements would require a number of permits and actions from various local, state, and federal agencies. The following table summarizes the types of permits that would be required for the program and project elements.

**Table 2-3. Public Agencies Whose Approval May Be Required**

| Permit/Action | Program[a] | Project |
|---|---|---|
| **Federal** | | |
| **United States Army Corps of Engineers** | | |
| Permit under Section 404 of the Clean Water Act for discharge of dredged or fill material into waters of the United States | X | X |
| Permit under Section 103 of the Marine Protection, Research, and Sanctuaries Act for the transportation of dredged material intended for ocean disposal | | X |
| Permit under Section 10 of the Rivers and Harbors Act for work or structures in or affecting Navigable waters of the United States | | X |
| **United States Fish and Wildlife Service** | | |
| Compliance with Section 7 of the federal Endangered Species Act for effects to listed species and critical habitat through coordination via the lead federal agency | X | X |
| **National Marine Fisheries Service** | | |
| Compliance with Section 7 of the federal Endangered Species Act for effects to listed species and critical habitat through coordination via the lead federal agency | | X |
| Compliance with the federal Marine Mammal Protection Act for effects (e.g., take or harassment) to marine mammals through coordination via the lead federal agency | | X |
| Compliance with the federal Magnuson-Stevens Fishery Act for effects to essential fish habitat through coordination via the lead federal agency | | X |
| **United States Environmental Protection Agency** | | |
| Confirm conformity with the Clean Air Act | | X |
| Determine suitability of dredged material for ocean disposal in accordance with Section 103 of the Marine Protection, Research, and Sanctuaries Act | | X |
| Review and submit recommendations to the Corps related to the issuance of permits under Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, and ensure compliance with Section 404(b)(1) of the Clean Water Act | | X |
| Review and submit recommendations to the California State Water Quality Control Board for the National Pollutant Discharge Elimination System permit for discharge of treated wastewater under Section 402 of the Clean Water Act | X | |
| Determine suitability of construction-related dewatering for ocean disposal or discharge into waters of the United States | | X |
| Coordinate with the Los Angeles Regional Water Quality Control Board for issuance of 401 Water Quality Certification | | X |
| **United States Coast Guard** | | |
| Permit for Private Aids to Navigation for Navigable Waters of the United States | | X |
| **State** | | |
| **Regional Water Quality Control Board**[b] | | |
| Permit under Section 402 of the Clean Water Act (National Pollutant Discharge Elimination System) | | X |
| General Permit (National Pollutant Discharge Elimination System) for dewatering and construction activities | X | X |
| Water Quality Certification under Section 401 of the Clean Water Act | X | X |
| Waste Discharge Requirements under the Porter-Cologne Act | | X |
| **California Office of Historic Preservation** | | |
| Compliance with Section 106 of the National Historic Preservation Act through coordination via the lead federal agency | | X |

**Table 2-3 (Continued)**

| Permit/Action | Program[a] | Project |
|---|---|---|
| **California Department of Fish and Game** | | |
| Streambed Alteration Agreement under Section 1602 of the California Fish and Game Code for activities that would alter a state river, stream, or other Waters of the State | X | |
| Consistency Determination under Section 2080.1 of the California Fish and Game Code for take of state-listed endangered or threatened terrestrial and aquatic species (that are also listed under the federal ESA) | X | X |
| Compliance with oil spill prevention and response planning requirements set forth in Subdivision 4 of 14 CCR Division 1 for marine vessels carrying petroleum and nontank vessels over 300 gross tons (Under the California Office of Spill Prevention and Response). | | X |
| **California Coastal Commission** | | |
| Coastal Development Permit for development within the coastal zone | | X |
| Federal Coastal Zone Management Act Consistency Determination | | X |
| **State Lands Commission** | | |
| Land Use Lease for encroachments, docks, dredging, and crossing on state tidal and submerged lands | | X |
| **California Department of Transportation** | | |
| Easement and/or rights-of-way | | X |
| **Local** | | |
| **South Coast Air Quality Management District** | | |
| Conformity with the Air Quality Management Plan | | X |
| Permit or update to existing permits for emissions | X | |
| **City of Los Angeles** | | |
| Easements and/or rights-of-way | | X |
| Building permits, fire plan approvals, land lease, and/or easements for construction of facilities at Port of Los Angeles, Royal Palms Beach, and Angels Gate Park | | X |
| **City of Carson** | | |
| Conformance to building and safety construction requirements at JWPCP | X | X |
| **County of Los Angeles** | | |
| Easements and/or rights-of-way | X | X |
| Easements through park and recreation areas | | X |
| Fire protection plan approvals | X | X |

[a] Applies to program elements other than JWPCP effluent management.
[b] Regional Water Quality Control Board-Los Angeles Region (Region 4) has jurisdiction in the project area.

## 2.1.5 Level of Analysis and General Methodology

As a result of the Clearwater Program planning effort, program and project elements have been identified and are evaluated in this Preliminary Screening Analysis at either the program or project level. A program-level analysis is prepared when the lead agency has a proposed program or series of actions over time that can be characterized as one large project and specific construction information is typically unavailable. A program-level analysis generally analyzes broad environmental effects of the program with the understanding that additional site-specific environmental review may be required for particular aspects of the program at the time those aspects are proposed for implementation and construction (CEQA Guidelines Section 15168). However, it is possible for a program-level analysis to identify and address all potential environmental impacts, which would preclude the need for additional project-level environmental documentation. Should there be project-specific impacts that are not analyzed in the program-level; a subsequent CEQA analysis would be required. Project-specific elements were identified in the MFP for a new ocean discharge system, which will be evaluated at the project level. A

project-level analysis generally has access to all the necessary construction information and is able to analyze the specific details of environmental effects of project elements. Therefore, in this document, program elements are analyzed at the program level, and project elements are analyzed at the project level. Any program or project element that is identified as having a potentially significant impact under construction or operation will be further analyzed in the EIR/EIS.

The Preliminary Screening Analysis analyzes potential impacts resulting from the construction and/or operation of individual elements. These elements form the building blocks for alternatives that are ultimately evaluated in the EIR/EIS. Therefore, some elements would not be constructed under the Clearwater Program. While the program elements are common to all program alternatives, different project elements combine to form the alternatives. For purposes of analysis in the Preliminary Screening Analysis, program elements are categorized by facility/location. The categories and associated program elements are shown in the following table.

**Table 2-4. Categories for Program Analysis**

| Category | Program Element Analyzed |
|---|---|
| Conveyance System | Conveyance improvements |
| WRPs | Expansion of the SJCWRP<br>Process optimization at the SJCWRP, POWRP, LCWRP, LBWRP<br>WRP effluent management at all WRPs (SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP) |
| JWPCP | Solids processing<br>Biosolids management |

Project elements are organized by functional category. The categories and associated project elements are shown in the following table.

**Table 2-5. Categories for Project Analysis**

| Category | Project Element Analyzed |
|---|---|
| Tunnel Alignment (onshore and offshore) | Wilmington to SP Shelf<br>Wilmington to PV Shelf<br>Figueroa/Gaffey to PV Shelf<br>Figueroa/Western to Royal Palms Beach |
| Shaft Sites | JWPCP East<br>JWPCP West<br>TraPac<br>LAXT<br>Southwest Marine<br>Angels Gate<br>Royal Palms |
| Riser/Diffuser Areas | SP Shelf<br>PV Shelf<br>Existing Ocean Outfalls |

For some environmental resources, the analysis herein is conducted at the program or project scale, rather than by individual facilities/elements. This occurs when the overall results are either all less than significant or all potentially significant. This organization applies to the following resources: agriculture, air quality, greenhouse gases, and traffic.

### 2.1.6 Document Organization

This document is organized into sections for each environmental resource topic. Each resource section includes the following:

- An impact table listing all thresholds (i.e., significance criteria) that will be analyzed for the resource. An overall significance determination for each threshold is provided based upon the analysis. The most severe impact determinations for all program elements and all project elements for each threshold are identified in the table. If no box is checked under a particular threshold in the summary impact table, that threshold does not apply to the program or project element being analyzed. Only those thresholds determined to be potentially significant will be included in the EIR/EIS.
- An analysis of the program, organized by threshold, followed by an analysis of the project, organized by threshold. At the beginning of the analysis, there is a summary of the impact determination for the threshold, followed by a list that identifies (with an X) elements that would result in potentially significant impacts during construction and operation. Only those elements considered to have a potentially significant impact will be brought forward for analysis in the EIR/EIS. Elements that have a dash (–) are considered to have no impact or less than significant impact and will not be addressed in the EIR/EIS.

# Chapter 3
# ENVIRONMENTAL CHECKLIST

## 3.1 Environmental Factors Potentially Affected

The environmental factors checked below would potentially be affected by this project (i.e., the program or project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklists on the following pages.

| | | |
|---|---|---|
| ☒ Aesthetics | ☐ Agriculture and Forestry Resources | ☒ Air Quality |
| ☒ Biological Resources | ☒ Cultural Resources | ☒ Geology/Soils/Minerals |
| ☒ Greenhouse Gas Emissions | ☒ Hazards and Hazardous Materials | ☒ Hydrology/Water Quality/Public Health |
| ☒ Land Use/Planning | ☒ Marine Environment (Marine Hydrology, Water Quality, Biological Resources, Noise and Public Health) | ☒ Noise and Vibrations (Terrestrial) |
| ☒ Employment, Housing, Socioeconomics, and Environmental Justice | ☒ Public Services | ☒ Recreation |
| ☒ Transportation and Traffic (Terrestrial) | ☒ Transportation and Traffic (Marine) | ☒ Utilities/Service Systems/Energy |
| ☒ Growth Inducing | ☒ Mandatory Findings of Significance | |

## Aesthetics Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **I.** | **AESTHETICS.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| AES-1. | Conflict with adopted goals or policies that protect visual quality of a designated scenic vista or scenic resource, resulting in an adverse aesthetic impact such as obstruction of view or degradation of visual character? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| AES-2. | Substantially damage scenic resources (including, but not limited to, trees, rock outcroppings, and historic buildings) within a state scenic highway? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |
| AES-3. | Substantially degrade the existing visual character or quality of the site or its surroundings? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| AES-4. | Result in an adverse effect due to shading on existing visual character or quality of the site or its surroundings? | ☐ | ☐ | ☒ | ☒ | ☐ | ☐ |
| AES-5. | Create a new source of substantial light or glare that would adversely affect day or nighttime views of the area? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |

## Aesthetics Program Discussion

**AES-1. Overall Determination: Less Than Significant Impact.** All of the program elements would not be located within a designated scenic vista or scenic resource area. Furthermore, construction and operation of program elements would not result in a degradation of visual character. Therefore, construction and operational impacts related to all program elements would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

X = Potentially Significant Impact and will be addressed in the EIR/EIS
– = Less Than Significant Impact or No Impact and will not be addressed in the EIR/EIS
N/A = Not Applicable

**Conveyance System.** The visual character of the JOS service area is a highly variable and diverse urban area. The conveyance system primarily exists underground in the public rights-of-way. The JOS service area has varying topography and a wide variety of building heights and shapes. These features block and prohibit clear lines of sight to public streets in many areas.

Construction of conveyance improvements would generally occur within the existing public street right-of-way. It would involve removing, replacing, or maintaining existing sewer lines. The construction would not involve tall cranes and would be limited in duration.

Once operational, the conveyance system would be located underground and would not have any large aboveground facilities. There may be some aboveground facilities located at existing pumping stations throughout the JOS service area which would be of similar size and scale as the existing pumping station facilities and which are screened from view with fencing and/or planted ornamental landscaping.

Construction and operation of conveyance improvements would not conflict with adopted goals or policies that protect the visual quality of a designated scenic vista or scenic resource due to the highly variable nature of the existing urban area, the lack of clear lines of sight in the urban area, and the temporary nature of the construction on the conveyance system. Therefore, construction and operation of conveyance improvements would result in impacts that are less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** The WRPs are not located within a designated scenic vista or scenic resource area (City of Los Angeles 1998; Garrow and Signo pers. comm.; City of Pomona 1976). The existing visual character of each WRP is generally described as industrial, comprising large wastewater treatment equipment, aboveground pipes, and machinery.

The surrounding visual character of each of the WRPs varies widely due to the differing surrounding land uses. Primarily, the WRPs are immediately surrounded by highly urbanized and channelized receiving waters including the San Gabriel River, San Jose Creek, and Coyote Creek. Also, immediately surrounding the WRPs are freeways and roads, including SR-60 and I-605. Other nearby uses add to the varying visual character including light industrial buildings, recreational/open space (El Dorado Park, Iron-Wood Nine Golf Course, and Elephant Hill), and single family and multi-family residential homes

(refer to Figures 2-4, 2-5, 2-6, 2-7 in Chapter 2 of the EIR/EIS for references to these surrounding land uses).

Under the program, all construction associated with the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would occur within the footprint of each WRP. Once operational, the WRP facilities would be either underground or would be part of existing WRP infrastructure.

WRP effluent management may result in a change in the amount of recycled water discharged into the receiving waters at each WRP. The discharges would use the same discharge points and pipes as currently used. Construction would not be required and operation would simply result in either a greater or lesser volume of recycled water discharging into the receiving waters. Therefore, the discharge of recycled water using existing discharge points would not result in an obstruction of views or degradation of visual character.

None of the WRPs are located within a designated scenic vista or scenic resource area; therefore, construction and operational impacts would not occur and the WRPs will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP is not included in a designated scenic vista or scenic resource area (City of Los Angeles 1998; Signo pers. comm.). The existing visual character of the JWPCP is heavy industrial comprising large wastewater treatment equipment, aboveground pipes, and pieces of machinery. Much of the site is highly visible from the elevated I-110, especially to northbound traffic. A portion of the southeast side of the site is visible from a residential neighborhood south of Lomita Boulevard. The structures on site vary greatly and are generally less than 50 feet high.

Construction would not occur at the JWPCP under the biosolids management element. There would be an increase in transportation of biosolids from the JWPCP for beneficial use at various locations throughout the state of California. The land application and beneficial use locations are generally located in areas dominated by agriculture or in light industrial/commercial areas. The actual land use application or beneficial use would occur on existing agricultural land or in existing buildings. Therefore, the existing aesthetic character of these areas consists of visual qualities associated with agricultural or industrial land uses. These qualities include large buildings, large equipment, high truck volumes, and relatively flat topography.

Some construction would occur within the existing footprint of the JWPCP to add several new digesters for solids processing and remove several existing ones. These activities would be located in proximity to the existing digesters on the interior of the JWPCP. Construction activities would not be visible from the exterior of the JWPCP because of interceding structures and distances from viewers outside of the JWPCP (see Figure 3-9 in Chapter 3 of the EIR/EIS for a location of solids processing construction location).

Since the JWPCP is not located within a designated scenic vista or scenic resource area, impacts associated with the construction and operation of solids processing facilities and the operation of biosolids management at the JWPCP would not occur. The increase in biosolids management at existing beneficial use areas or land application areas throughout the state of California are already part of the visual character of the existing setting (e.g., trucks traveling along roadways). The additional trucks associated with the increase in biosolids management would not alter the existing conditions; therefore, impacts would be less than significant. These issues will not be addressed in the EIR/EIS at the program level.

**AES-2. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not be located near a designated or proposed state scenic highway, and would not substantially damage scenic resources within a state scenic highway. Therefore, construction and operational impacts related to all program elements would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level. (See AES-1 [Program] for a discussion of the existing visual character and quality of program elements and additional construction and operation details.)

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The construction of the conveyance system may occur at or near the public rights-of-way of designated scenic roadways. However, construction and maintenance activities of utilities within the public rights-of-way, scenic or otherwise, are typical roadway activities that would not alter the existing scenic resources viewed from the roadway. Furthermore, since the construction would be temporary and short in duration, any change to the aesthetic value of the scenic road would be restored upon construction completion. Once operational, the conveyance system would be located underground and would not reduce the aesthetic value of a designated state scenic roadway. Construction and operation of the conveyance improvements would not reduce the aesthetic value of any scenic roadways; therefore, impacts would be less than significant. This issue will not be addressed in the EIR/EIS at the program level.

**WRPs.** The WRPs are not located near a designated or proposed state scenic roadway (Caltrans 2009). Therefore, impacts would not occur during construction or operation and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP is not located near a designated or proposed state scenic roadway (Caltrans 2009). Therefore, impacts would not occur during the construction or operation of solids processing facilities or the operation of biosolids management at the JWPCP. This issue will not be addressed in the EIR/EIS at the program level.

There would be an increase in transportation of biosolids from the JWPCP and beneficially applied to various locations throughout the state of California. The increased number of trucks may travel on or near designated scenic roadways; however, trucks are part of the visual character of roadways, scenic or otherwise. The land applications and beneficial use locations are generally located in areas dominated by agriculture or in light industrial/commercial areas, which could be located adjacent to or near designated scenic roadways. However, the actual land use application or beneficial use would occur on existing agricultural land or in existing buildings. Therefore, additional land use applications or truck trips to existing buildings would not result in an aesthetic change to any designated scenic roadways that may exist. Impacts would be less than significant. This issue will not be addressed in the EIR/EIS at the program level.

**AES-3. Overall Determination: Less Than Significant Impact**. Construction and operation of all program elements would not substantially degrade the existing visual character or quality of the site or its surroundings. Therefore, construction and operational impacts related to all program elements would be less than significant and this threshold will not be addressed in the EIR/EIS at the program level. **(**See AES-1 [Program] for a discussion of the existing visual character and quality of program elements and additional construction and operation details.)

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction and operation of conveyance improvements would not obstruct views or degrade the visual character of existing roadways or the surrounding urban character of the JOS service area because structures exist that interfere with the line of sight and because of distance and scale. Construction and operational impacts would be less than significant and this issue will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction equipment for plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would be contained within the footprint of each facility (see Figures 3-5, 3-6, 3-7, and 3-8 in Chapter 3 of the EIR/EIS for a location of the construction at each WRP). Construction would generally occur on the interior of the WRP property and not on the periphery. Therefore, construction equipment would be screened from view by existing facilities and topography, and would be distant from off-site viewers. Construction impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

Once operational, the new equipment at the WRPs would blend with the existing equipment within the footprint of these facilities. The new equipment would be of the same massing and height as the existing WRP. Furthermore, process optimization would primarily consist of equipment that would operate underground and have limited aboveground features. Therefore, operational impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

WRP effluent management may result in a change in the amount of recycled water discharged into the receiving waters at each WRP. Construction would not be required and operation would simply result in either a greater or lesser volume of recycled water discharging into the receiving waters. Therefore, the discharge of recycled water using existing discharge points would not substantially degrade the visual character of the area.

**JWPCP.** Construction equipment at the JWPCP for solids processing would be contained within the footprint of the facility. Construction would generally occur on the interior of the JWPCP property, and not on the periphery of the facility. Therefore, construction equipment would be screened from view by existing facilities and topography, and would be distant from off-site viewers. Construction impacts would be less than significant, and this issue will not be addressed at the program level in the EIR/EIS.

Once operational, the equipment at the JWPCP would blend with the existing equipment within the footprint of the existing facilities. The new equipment would be of the same massing and height as the existing JWPCP equipment. Therefore, impacts would be less than significant and this issue will not be addressed at the program level in the EIR/EIS.

Biosolids management would use existing agricultural land or existing buildings; therefore, it would not result in an obstruction of view or degradation of visual character of a designated scenic resource because the land and buildings already exist. Biosolids management would increase the number of trucks in the locations where beneficial use is performed. Operational impacts associated with the biosolids management element would be less than significant and will not be addressed in the EIR/EIS at the program level.

**AES-4. Overall Determination: No Impact.** Construction and operation of program elements would not result in an adverse effect due to shading on existing visual character or quality of the site or its surroundings. Therefore, no impacts would occur and this threshold will not be addressed in the EIR/EIS at the program level. (See AES-1 [Program] for a discussion of the existing visual character and quality of program elements and additional construction and operation details.)

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the conveyance system would not use tall cranes or other large construction equipment that would have a shading impact on surrounding land uses. Furthermore, since the construction would be temporary and short in duration, any effect due to shading would be eliminated upon construction completion. Operation of the conveyance system would be completely underground, and would not result in shading or shadow impacts. Impacts would not occur under construction or operation; therefore, this issue will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction of the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would be located internal to each WRP footprint and not on the periphery. Any shading generated by the construction equipment such as cranes would not have an impact on surrounding land uses. Impacts would not occur under construction; therefore, this issue will not be addressed in the EIR/EIS at the program level.

Under operation, most of the process optimization equipment at the WRPs would be below ground. Any new aboveground equipment would be low profile and would blend with the existing equipment and facilities at the WRPs. Plant expansion at the SJCWRP would take place immediately adjacent to the existing treatment facilities on the western/northwest side of the plant. Therefore, the expansion would blend in with the existing facilities and not result in shading or shadowing effects. Furthermore, there are no sensitive receptors to shading or shadowing in the affected area of SJCWRP. Operational impacts would not occur; therefore, this issue will not be addressed in the EIR/EIS at the program level.

WRP effluent management would not result in any new construction at any of the WRPs. Furthermore, the increase or decrease in recycled water discharging into receiving waters would not result in any type of shading. Therefore, WRP effluent management would result in no shading or shadowing impacts and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction of the solids processing element at the JWPCP would be located internal to the JWPCP facilities, and not on the periphery. Therefore, any shading generated by the construction equipment for the new digesters would not have an impact on surrounding land uses. All new aboveground digesters would blend with the existing equipment and facilities at the JWPCP. Therefore, construction and operation of the solids processing facilities would not result in shading or shadowing

impacts on surrounding land uses. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Construction would not occur under the program biosolids management element. Therefore, construction impacts on shading and shadowing would not occur. Operation of the biosolids management element would result in an increased number of truck trips to transport the increased quantity of biosolids from the JWPCP to beneficial use locations and/or land fill locations. The transportation of biosolids via semi-truck would not result in shading/shadow impacts. Therefore, impacts under the operation of biosolids management would not occur and will not be addressed in the EIR/EIS at the program level.

**AES-5. Overall Determination: Less Than Significant Impact.** Construction and operation of program elements would not create a new source of substantial light or glare that would adversely affect nighttime views of the area. Construction and operational impacts related to all program elements would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level. (See AES-1 [Program] for a discussion of the existing visual character and quality of program elements and additional construction and operation details.)

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the conveyance system would not occur at nighttime unless it is required by the jurisdiction where the construction were to occur. There would likely be no nighttime lighting associated with the conveyance systems. Construction of the conveyance system would primarily occur within the public rights-of-way. Lighting would be hooded and directed on the construction site. Spill would be minimized due to the need of construction workers to see into the conveyance system trench to perform construction activities. Therefore, impacts would be less than significant and will not be addressed in the EIR/EIS at the program level. Once operational, the conveyance system would be located underground and would not require lighting. Periodically, emergency maintenance of the conveyance system would be needed at night if a portion of the conveyance system needs repair. However, this is temporary, periodic, and currently occurs within the JOS. Therefore, operation of the conveyance improvements would not require nighttime lighting and would not produce substantial light or glare. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Each WRP has nighttime lighting for safety and operation purposes. Furthermore, the Sanitation Districts perform regular and periodic shut downs at night during low flow periods as part of their regular operation and maintenance of the WRPs. These shutdowns require nighttime lighting. There may be some nighttime construction for plant expansion of the SJCWRP and process optimization at the WRPs. Since the Sanitation Districts currently perform regular nighttime maintenance at the WRPs, which uses lighting, the temporary and periodic construction of the expansion and process optimization would not result in a significant change in periodic nighttime lighting. Furthermore, periodic lighting at the WRPs from nighttime maintenance as well as construction activities from unassociated projects, such as roadway construction and maintenance, is the existing condition. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Once operational, plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not result in additional nighttime lighting. Some ancillary lighting may be

added immediately around the SJCWRP expansion area; however, existing lighting would be sufficient for safety purposes. Process optimization would be buried below ground, and the existing use above ground would be returned to current conditions. Therefore, under operating conditions, process optimization would result in the same lighting as existing conditions. Glare and lighting impacts associated with plant expansion and process optimization would be less than significant and will not be addressed in the EIR/EIS at the program level.

Currently, wastewater effluent management at the WRPs does not include nighttime lighting. Under the program, it would also not include nighttime lighting. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP currently has nighttime lighting for safety and operation purposes. It is surrounded by a variety of nighttime light-producing uses including the I-110, athletic fields, and retail centers along Main Street. Figueroa Street is bound on both sides by the JWPCP between Lomita Boulevard and Sepulveda Boulevard and does not have any sensitive light land uses (i.e., residential homes). Currently, biosolids trucks travel north on Figueroa Street and access I-110 using Figueroa Street and Sepulveda Boulevard.

Construction and operation of solids processing facilities at the JWPCP would result in some additional nighttime lighting to the JWPCP. Nighttime construction may be required during low flow periods of the JWPCP. Under operating conditions, lights would be located on top of each of the solids processing digesters for safety purposes. This additional lighting at the JWPCP during construction and operation would not result in a substantial increase in light or glare at the JWPCP. The additional lighting on the six digesters would not produce enough light to increase the overall effect of the existing nighttime lighting at the JWPCP. Construction and operation of the solids processing digesters would result in impacts that are less than significant and will not be addressed in the EIR/EIS at the program level.

The increased number of trucks transporting biosolids would use Figueroa Street to reach I-110. Lighting would come from trucks transporting biosolids at night. However, the area north of the JWPCP is industrial, and currently there are numerous sources of nighttime lighting including I-110. Therefore, the additional trucks from biosolids management would not produce enough light to increase the overall effect of the existing nighttime lighting in the area. Biosolids would be either applied to existing agricultural lands or beneficially used at existing buildings. Neither of these actions would require additional lighting nor cause additional glare. Therefore, operational impacts associated with biosolids management would not occur and will not be addressed in the EIR/EIS at the program level.

## Aesthetics Project Discussion

**AES-1. Overall Determination: Potentially Significant Impact.** Construction of several project elements have the potential to conflict with adopted goals or polices that protect visual quality of a designated scenic vista or scenic resource. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Once operational, the project elements would be located primarily underground or under the ocean with a few aboveground facilities located at the shaft sites. Therefore, operation of all project elements would not result in adverse aesthetic impacts on designated visual resources or a degradation of visual character. (Refer to Figures 3-13 to 3-23 for locations and surrounding land uses of shaft sites in Chapter 3 of the EIR/EIS).

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**Tunnel Alignments – Onshore and Offshore.** Construction and operation of the onshore and offshore tunnels would occur at depths well below ground surface. There are no designated scenic vistas or resources below ground surface. Therefore, construction and operation of the tunnels would not conflict with adopted goals or policies that protect visual quality of a designated scenic vista or scenic resource. Impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East and JWPCP West.** See AES-1 (Program) for a description of the existing visual character of the JWPCP. The JWPCP is not included in a designated scenic vista or scenic resource area (City of Los Angeles 1998; Signo pers. comm.). Since there are no designated scenic vistas or resources within the general vicinity of the JWPCP, construction and operation at the JWPCP East or JWPCP West shaft site would not result in impacts on designated scenic vistas or resources. This issue will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – TraPac, LAXT, and Southwest Marine.** The Trans Pacific Container Service Corporation (TraPac) shaft site is located in the Port of Los Angeles, generally at the intersection of Harry Bridges Boulevard and vacated King Boulevard/Wilmington Boulevard. The shaft site would be approximately 1 acre during construction of the project and approximately 0.3 acre during operation. The Port of Los Angeles is a highly industrialized area with many active heavy industry facilities. TraPac is a container terminal that stores hundreds of stacked containers from cargo ships. These containers can be stacked as high as several stories (each container is assumed to be approximately 10 feet in height). Directly across from the TraPac terminal is the Harry Bridges Boulevard Buffer, which is a park area for the residents of Wilmington. The buffer includes a 30 to 40 foot tall earthen berm along Harry Bridges Boulevard to protect Wilmington residents and park users from the noise from activities at the TraPac container terminal and from trucks traveling on Harry Bridges Boulevard. The Harry Bridges Boulevard buffer is not considered a designated scenic vista or scenic resource. There are several designated scenic vistas along Harbor Boulevard in San Pedro and the Port of Los Angeles. However, these vistas are over 2 miles away and topography, as well as existing buildings and port activities, would prevent clear and direct views to construction activities and equipment at the TraPac shaft site. Furthermore, the existing stacked containers at TraPac would continue to exist during construction and operation at the shaft site and would block direct views of construction activities and equipment at the shaft site from these vistas. Once the shaft site is operational, it would have limited (e.g., access hatch) or no aboveground facilities.

Therefore, construction and operation at the TraPac shaft site would not result in any impacts on designated scenic vistas or scenic resources and will not be addressed in the EIR/EIS at the project level.

The Los Angeles Export Terminal (LAXT) shaft site is located on Ferry Street across from the City of Los Angeles Terminal Island Water Reclamation Plant in the Port of Los Angeles. See the TraPac discussion for a general description of the visual character of the Port of Los Angeles. There are no sensitive receptors from an aesthetic standpoint (e.g., single-family residential or recreational) near or within the general proximity of the LAXT shaft site. Construction and operation at the LAXT shaft site would result in no impact and will not be addressed in the EIR/EIS at the project level.

The Southwest Marine shaft site is located west of South Seaside Avenue on Southwest Marine in the Port of Los Angeles. There are no sensitive receptors from an aesthetic standpoint (e.g., single-family residential or recreational) near or within the general proximity of the Southwest Marine shaft site. Construction and operation at the Southwest Marine shaft site would result in no impacts on scenic views and will not be addressed in the EIR/EIS at the project level.

**Shaft Site – Angels Gate and Royal Palms.** The Angels Gate shaft site is located in the community of San Pedro near the intersection of Gaffey Street and Paseo Del Mar. The City of Los Angeles Transportation Element (City of Los Angeles 1999a) designates Paseo Del Mar, Harbor Boulevard, and South Pacific Avenue as Future Alignments Designated as Scenic. However, these routes are not officially designated scenic highways by the federal government, state, or county. The Pacific Ocean, a scenic resource of California, can be seen from within Angels Gate Park. In addition, the Korean Bell, which is a landmark in the city of Los Angeles, is immediately north of the shaft site. Therefore, construction at the Angels Gate shaft site would result in potentially significant impacts and will be addressed in the EIR/EIS at the project level. Once operational, there would be limited, low-profile, facilities at the Angels Gate shaft site (e.g., access hatch). This low-profile facility would not block or intercede with views from the various locations discussed above because of its low profile. Therefore, operational impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

The Royal Palms shaft site would be located at the existing manifold facilities owned by the Sanitation Districts at the beach. The beach is located off of Paseo Del Mar, which is a designated scenic road in the San Pedro Community Plan. Construction at the Royal Palms shaft site would result in potentially significant impacts and will be addressed in the EIR/EIS at the project level. Once operational, there would be the same existing Sanitation District aboveground facilities at the beach that are currently there. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – San Pedro Shelf.** The Pacific Ocean is generally considered a scenic resource. There are some oil platforms currently located several miles off shore from the Palos Verdes Peninsula. The SP Shelf riser and diffuser would be located approximately 7 miles off the coast of the Port of Los Angeles. During construction, offshore barges and a construction platform would be present. These vessels and platform would be illuminated for safety and due to construction occurring 24 hours a day. At sea level, the curvature of the earth and atmospheric conditions limit a person's range of vision to approximately 3 miles. The SP Shelf construction site would be located beyond this distance and would blend into the horizon. At night, the lights projected by the construction site would be difficult to see from land and would not be distinguishable from existing oil platforms offshore, which currently use nighttime lighting. Therefore, construction of the SP Shelf riser and diffuser would result in a less than significant impact on designated scenic resources or vistas and will not be addressed in the EIR/EIS at the project level.

Once operational, the riser and diffuser would exist on the ocean floor of the SP Shelf. Maintenance may be required periodically, but would typically be done during the day, using boats and barges. Barges, boats, and ships are typically seen on the Pacific Ocean in this area due to its proximity to the Ports of Los Angeles and Long Beach; therefore, the few additional barges on the ocean required for periodic maintenance of the SP Shelf riser and diffuser would not result in a significant impact on a designated scenic vista or resource. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – Palos Verdes Shelf.** The offshore construction equipment associated with the PV Shelf riser and diffuser would have the potential to conflict with goals and policies that protect the visual quality of scenic resources or vistas (e.g., the Pacific Ocean). Although the offshore construction would be considered temporary, it would introduce large equipment and lights not normally located within the general vicinity of scenic vistas and resources. The equipment and lights would be visible from land due to the proximity of the riser and diffuser area to the shore (approximately 2 miles). Therefore, construction of the PV Shelf riser and diffuser would result in a potentially significant impact on a designated scenic resource or vista and will be addressed in the EIR/EIS at the project level.

The PV Shelf operations would be the same as the SP Shelf operations described previously. Operation of the riser and diffuser on the PV Shelf would result in no impacts under operating conditions and will not be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – Existing Ocean Outfalls.** The rehabilitation of the existing ocean outfalls would have the potential to conflict with goals and policies that protect the visual quality of scenic resources or vistas (e.g., the Pacific Ocean). Although the offshore construction would be considered temporary, it would introduce equipment and lights not normally located within the general vicinity of scenic vistas and resources. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS.

**AES-2. Overall Determination: No Impact.** There are no scenic roadways that would be affected by project elements. Construction impacts would not damage scenic resources along a scenic route. Therefore, no impacts would occur and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** See AES-1 (Program) for a description of the existing visual character of the JWPCP and AES-1 (Project) for a discussion of operational impacts associated with these project elements. There are no designated scenic roadways within the vicinity of the JWPCP; therefore, construction and operation at the JWPCP East and JWPCP West shaft sites would not result in an impact. A segment of the onshore tunnel alignment is within the vicinity of the locally designated city of Los Angeles scenic roadway, Gaffey Street (City of Los Angeles 1999a). This segment of the onshore tunnel would be located below ground surface and below Gaffey Street. Therefore, construction and operation of the onshore tunnel would not impact any scenic resources within the viewshed of Gaffey Street. Furthermore, construction and operation of the offshore tunnel would not result in an impact on

designated scenic roadways as there are no roadways off shore or under the ocean floor. There are no scenic roadways located within the vicinity of the TraPac, LAXT, and Southwest Marine shaft sites (Caltrans 2010; City of Los Angeles 1999a). The County of Los Angeles Transportation Element (City of Los Angeles 1999a) designates Paseo Del Mar, Harbor Boulevard, and South Pacific Avenue as Future Alignments Designated as Scenic. However, these routes are not officially designated scenic highways by federal, state, or County. Thus, for the purposes of this threshold, these roadways are not considered to be designed state scenic roadways. Furthermore, impacts to views from the shaft sites adjacent to these roads and surrounding areas are discussed in AES-1, AES-3, and AES-4. Therefore, construction and operational impacts of the project would not occur and will not be addressed in the EIR/EIS at the project level.

**AES-3. Overall Determination: Potentially Significant Impact**. Construction and operation of several of the project elements could substantially degrade the existing visual character or quality of the site or its surroundings. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnel would be located below ground surface and below the ocean floor. There is no visual character or quality at the depths of construction or operation. Therefore, construction and operation of the onshore and offshore tunnels would not degrade existing visual character or quality and impacts would not occur. This issue will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East and JWPCP West.** Construction at either the JWPCP East or JWPCP West shaft sites would occur over a number of years. Although a noise barrier would be located around either of these sites, construction equipment such as cranes would be visible to adjacent sensitive receptors (residential receptors, recreation receptors at the Wilmington Athletic Complex). Under operating conditions, a surge tower would be located on either site, along with other ancillary equipment. The surge tower could change the existing visual character and quality of either location. Therefore, construction and operation of either the JWPCP East or JWPCP West shaft sites would result in potentially significant impacts. This issue will be addressed at the project level in the EIR/EIS.

**Shaft Sites – TraPac, LAXT, and Southwest Marine.** The TraPac, LAXT, and Southwest Marine shaft sites are all located within the Port of Los Angeles. The visual character and quality of these areas are highly industrial. There are no aesthetically sensitive receptors with views of TraPac, LAXT, and Southwest Marine. Therefore, construction and operation would not substantially degrade the existing visual character or quality of the site or its surroundings. Impacts would not occur and this issue will not be addressed at the project level in the EIR/EIS.

**Shaft Sites – Angels Gate and Royal Palms.** The Angels Gate and Royal Palms shaft sites are adjacent to the Pacific Ocean. Furthermore, they are located within designated recreational areas and have the unique visual character of a coastal park. Therefore, construction and operation at either the Angels Gate shaft site or Royal Palms shaft site could potentially degrade the existing visual character or quality of the

site or its surroundings. Construction and operational impacts would be potentially significant and will be addressed at the project level in the EIR/EIS.

**Riser/Diffuser Areas – San Pedro Shelf, Palos Verdes Shelf, and Existing Ocean Outfalls.** The construction at the riser and diffuser areas could result in a change in the visual character or quality of views of the Pacific Ocean, which is considered a scenic resource. Therefore, construction impacts would be potentially significant and will be addressed at the project level in the EIR/EIS. Once operational, the riser and diffuser on the PV Shelf or the SP Shelf would be located on the sea floor, as are the existing ocean outfalls. Maintenance trips would be required by boats a few times a year, which already occur to the existing ocean outfalls. Furthermore, due to the proximity of the Ports of Los Angeles and Long Beach, barges and ships are common off the coast of Southern California and comprise the existing visual character of views to the Pacific Ocean. Therefore, operational impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

**AES-4. Overall Determination: Potentially Significant Impact.** Construction and operation of several project elements could result in an adverse effect due to shading on existing visual character or quality of the site or its surroundings. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnel alignments would be located underground where there would be no possibility of shadows or shading. Therefore, construction and operation of the tunnels would not result in shading impacts. Impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East and JWPCP West.** During construction at either the JWPCP East or JWPCP West shaft sites, there would be a number of large pieces of equipment, including approximately 100-foot tall cranes and 20-foot tall noise barriers. These pieces of equipment could cast shadows on surrounding sensitive receptors including residences and the Wilmington Athletic Complex. Furthermore, under operating conditions, there would be a surge tower located at either one of these shaft sites, which could also cast shadows on sensitive receptors. Therefore, impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**Shaft Sites – TraPac, LAXT, and Southwest Marine.** There are no sensitive receptors that would be affected by shadows in the Port of Los Angeles. The shaft sites at TraPac, LAXT, and Southwest Marine would be located in highly industrialized areas with no aesthetically sensitive surrounding land uses; therefore, construction at these locations would not result in adverse shading to sensitive receptors. Once operational, the only visible element remaining would be an access hatch to a belowground access structure. Since these facilities are low profile, they would not result in shade and shadow impacts. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – Angels Gate and Royal Palms.** During construction at either the Angels Gate or Royal Palms shaft sites, there would be a 20-foot-tall noise barrier. This noise barrier could cast shadows on surrounding sensitive receptors including residences. Therefore, shading impacts during construction would be potentially significant and will be addressed in the EIR/EIS at the project level. Once operational, either shaft site would consist of a belowground access structure. Since these facilities are low profile, they would not result in shade and shadow impacts. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level

**Riser/Diffuser Areas – San Pedro Shelf, Palos Verdes Shelf, and Existing Ocean Outfalls.** These locations would be off the coast of Southern California. A barge would be stationed over the riser and diffuser area for long periods of time during construction, and some equipment could cast shadows. However, the only potentially sensitive receptor off the coast are marine biological species, and the small area at which the barge and equipment would cover compared to the entire coast of Southern California at varying depths is negligible. Furthermore, once the riser and diffuser are constructed on either the PV Shelf or the SP Shelf, they would sit on the sea floor and not cast shadows. The existing ocean outfalls would remain in their current location and do not cast shadows. Therefore, impacts would be less than significant during construction and operation and will not be addressed in the EIR/EIS at the project level.

**AES-5. Overall Determination: Potentially Significant Impact.** Construction of several project elements have the potential to create a new source of substantial light or glare that would adversely affect nighttime views of the area. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Once operational, the project elements would not create any nighttime lighting, since all project elements would be located below ground surface and, therefore, would not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnel alignments would be located underground. There are no sensitive receptors to light or glare underground. Therefore, construction and operation of the tunnels would not result in light or glare impacts. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East and JWPCP West.** Construction at either the JWPCP East or JWPCP West shaft site would involve working swing shifts, which would also include lights and glare at night for several years. The nighttime lighting used during construction could produce substantial light or glare, adversely affecting sensitive receptors, such as residences. Therefore, construction at the JWPCP East or JWPCP West shaft sites would result in potentially significant impacts and will be addressed in the EIR/EIS at the project level.

Once operational, the JWPCP East or JWPCP West shaft sites could have surge towers approximately two to three stories in height. The surge towers would resemble existing towers at the JWPCP and would have safety lighting associated with them. These lights would be hooded and would be similar to the existing safety lighting at the JWPCP. Therefore, operational impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – TraPac, LAXT, and Southwest Marine.** The shaft sites are located within the highly industrialized area of the Port of Los Angeles. The Port of Los Angeles has an existing nighttime visual setting with numerous lights. Although TraPac and Southwest Marine would be access shaft sites, and not generally used during the nighttime, they would have some safety lighting. LAXT would be a working shaft site and would have nighttime lighting. There are no light-sensitive receptors within proximity to these shaft sites. Furthermore, since the port already has significant amounts of nighttime lighting, the lighting used at each of these shaft sites for a temporary construction period would not result in significant impacts. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

Once these shaft sites are operational, they would have low-profile access hatches. These hatches may have some security lighting. However, as discussed previously, there is a significant amount of lighting generated by the port that makes up the existing nighttime setting, and the access hatch lighting would not significantly add to or alter the existing nighttime setting of the port. Therefore, operational impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – Angels Gate and Royal Palms.** See the JWPCP East and JWPCP West shaft sites discussion. Construction at either the Angels Gate or Royal Palms shaft site would introduce light and glare to existing sensitive receptors during nighttime construction activities. Impacts would be potentially significant during construction and will be addressed in the EIR/EIS at the project level.

Once operational, there may be some low-profile aboveground facilities at either shaft site. These facilities may have safety lighting. The safety lighting would be low profile and hooded so as not to cast glare or light. There are currently light poles and nighttime street lighting in both locations; therefore, operational impacts at Angels Gate and Royal Palms would be less than significant and will not be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Areas – San Pedro Shelf, Palos Verdes Shelf, and Existing Ocean Outfalls.** The offshore construction would involve swing shifts, which would also include lights. The nighttime lighting used during construction could produce substantial light or glare adversely affecting views. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the new riser and diffuser would be located on the bottom of the ocean. No lighting would be associated with the operation of these. In addition, the existing ocean outfalls would remain in their existing location and would not require lighting. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Agriculture and Forestry Resources Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| | | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| **II.** | **AGRICULTURE AND FOREST RESOURCES.** In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the program/project: | | | | | | |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| | | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| AG-1. | Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| AG-2. | Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |
| AG-3. | Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), or timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| AG-4. | Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| AG-5. | Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |

## Agriculture and Forestry Resources Program Discussion

**AG-1. Overall Determination: Less Than Significant.** Construction and operation of the program elements would result in less than significant impacts on agricultural and forest lands. Therefore, Threshold AG-1 will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | – | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | – | – |

**AG-1. All Program Elements.** The program elements are primarily located in the county of Los Angeles, which is urbanized. Biosolids management would truck treated biosolids to other areas of California for beneficial use, including land use application at farms. The U.S. Environmental Protection Agency (EPA) regulates biosolids through 40 Code of Federal Regulations (CFR) Part 503. The standards are applicable to land application, surface disposal, and incineration. For disposal in a municipal solid waste landfill, the biosolids must meet standards from 40 CFR Part 258. Biosolids generated at the JWPCP meet EPA Class B pathogen reduction requirements provided in Alternative 2, Use of Processes to Significantly Reduce Pathogens, through time and temperature requirements for anaerobic digestion. Vector attraction reduction requirements are met by reducing the mass of volatile solids during anaerobic digestion. JWPCP biosolids are sampled monthly and analyzed for total metals concentrations. Since the 1993 promulgation of the federal rules governing biosolids management, the JWPCP biosolids have consistently complied with the most stringent requirements related to metals concentrations. Since the biosolids generated at the JWPCP meet all federal requirements, they can generally be utilized at any location. The biosolids management program element would not convert farmland to another use since it would apply biosolids on existing farmland for beneficial use.

The proposed locations for the program are identified by the California Department of Conservation's Farmland Mapping and Monitoring Program as "area not mapped" and thus, would not convert prime farmland, unique farmland, or farmland of statewide importance (farmland), to non-agricultural use (California Department of Conservation 2008).

Therefore, the program elements would not convert any farmland to a non-agricultural use. Impacts would not occur; therefore, this issue will not be addressed in the EIR/EIS at the program level.

**AG-2. Overall Determination: Less Than Significant.** Construction and operation of the program elements would result in less than significant impacts on agricultural and forest lands. Therefore, Threshold AG-2 will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | – | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | – | – |

**AG-2. All Program Elements.** The program elements would be located primarily in the urbanized Los Angeles area. The Los Angeles area is not a part of the Williamson Act (Department of Conservation Division of Land Resource Protection 2006) and is generally not zoned for agricultural uses. The SJCWRP is located adjacent to land zoned A-1 (light agriculture) and the WRP site is zoned residential/agriculture (County of Los Angeles Department of Regional Planning 2010). However, the expansions and upgrades would be located within the footprint of the existing SJCWRP, which currently is not agricultural land, and no land zoned for agriculture would be taken out of use by the proposed expansions and upgrades at this WRP. All of the other program and project elements would be located on lands that are not zoned for agriculture or identified by the Williamson Act.

The biosolids management program element would not conflict with existing zoning; rather, it would apply biosolids on existing farmland, currently zoned as farmland or currently within the Williamson Act, to be beneficially used. The program elements would not conflict with existing zoning for agricultural use or conflict with a Williamson Act contract. Therefore, impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

**AG-3. Overall Determination: Less Than Significant.** Construction and operation of the program elements would result in less than significant impacts on agricultural and forest lands. Therefore, Threshold AG-3 will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | – | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | – | – |

**AG-3. All Program Elements.** The program would not be located on forest land. The biosolids management element would not involve the beneficial use of biosolids on any forest land. Therefore, the construction and operation of the program elements would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), or timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)). Therefore, no impact would occur, and this issue will not be addressed in the EIR/EIS at the program level.

**AG-4. Overall Determination: Less Than Significant.** Construction and operation of the program elements would result in less than significant impacts on agricultural and forest lands. Therefore, Threshold AG-4 will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | – | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | – | – |

**AG-4. All Program Elements**. The program elements would not be located on forest land. The biosolids management element would not involve the beneficial use of biosolids on any forest land. Therefore, the construction and operation of the program elements would not result in the loss of forest

land or conversion of forest land to non-forest use. No impact would occur, and this issue will not be addressed in the EIR/EIS at the program level.

**AG-5. Overall Determination: Less Than Significant.** Construction and operation of the program elements would result in less than significant impacts on agricultural and forest lands. Therefore, Threshold AG-5 will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | – | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | – | – |

**AG-5. All Program Elements**. See discussion under AG-1 (Program) and AG-2 (Program). There is no existing farmland within or around the program element sites. The construction and operation of the program elements would not involve other changes in the existing environment that would result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. Biosolids management would not conflict with existing zoning; rather, it would apply biosolids on existing farmland to be beneficially used. Impacts would not occur, and this issue will not be addressed in the EIR/EIS at the program level.

## Agriculture and Forestry Resources Project Discussion

**AG-1. Overall Determination: No Impact.** Construction and operation of all project elements would result in no impacts on agriculture or forest lands. Therefore, Threshold AG-1 will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**AG-1. All Project Elements**. The project element locations are identified as "Urban and Build-Up Land" on the Important Farmland of California 2006 map (California Department of Conservation 2009). Furthermore, the project elements are located in a predominately developed urban setting with no agricultural uses on or surrounding the project area. Offshore project elements would be located in the ocean, which is not used as farmland. Therefore, the project elements would not convert any farmland to a non-agricultural use. Impacts would not occur, and this issue will not be addressed in the EIR/EIS at the project level.

**AG-2. Overall Determination: No Impact.** Construction and operation of all project elements would result in no impacts on agriculture or forest lands. Therefore, Threshold AG-2 will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**AG-2. All Project Elements.** The project elements would be located primarily in the urbanized Los Angeles area. The Los Angeles area is not a part of the Williamson Act (Department of Conservation Division of Land Resource Protection 2006) and is generally not zoned for agricultural uses. The offshore project elements would be located in the ocean, which is not used as farmland. The project elements would not conflict with existing zoning for agricultural use or conflict with a Williamson Act contract. Therefore, no impact would occur, and this issue will not be addressed in the EIR/EIS at the project level.

**AG-3. Overall Determination: No Impact.** Construction and operation of all project elements would result in no impacts on agriculture or forest lands. Therefore, Threshold AG-3 will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**AG-3. All Project Elements.** The project elements would be located on urbanized land or in the ocean. Therefore, no impact would occur on forestland, and this issue will not be addressed in the EIR/EIS at the project level.

**AG-4. Overall Determination: No Impact.** Construction and operation of all project elements would result in no impacts on agriculture or forest lands. Therefore, Threshold AG-4 will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**AG-4. All Project Elements.** See AG-3 (Project). Therefore, the construction and operation of the project elements would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur, and this issue will not be addressed in the EIR/EIS at the project level.

**AG-5. Overall Determination: No Impact.** Construction and operation of all project elements would result in no impacts on agriculture or forest lands. Therefore, Threshold AG-5 will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**AG-5. All Project Elements**. See discussion under AG-1 (Project) and AG-2 (Project). Impacts would not occur, and this issue will not be addressed in the EIR/EIS at project level.

## Air Quality Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **III.** | **AIR QUALITY.** When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| AQ-1. | Conflict with or obstruct implementation of the applicable air quality management plan? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| AQ-2. | Exceed the SCAQMD significance thresholds for construction- and/or operation-related emissions? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| AQ-3. | Exceed SCAQMD's Localized Significance Thresholds? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| AQ-4. | Create an objectionable odor at the nearest sensitive receptor? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| AQ-5. | Does not conform to the EPA-approved State Implementation Plan and exceed de minimis thresholds? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| AQ-6. | Expose the public to significant levels of toxic air contaminant? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Air Quality Program Discussion

**AQ-1 to AQ-6. Overall Determination: Potentially Significant Impact.** All program elements, except conveyance improvements and WRP effluent management, would emit emissions during construction and operation that could exceed thresholds. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | X |
| JWPCP – Biosolids Management | N/A | X |

**All Program Elements (Except Conveyance Improvements and WRP Effluent Management).** Construction of all program elements except conveyance improvements and WRP effluent management (which are discussed below) has the potential to emit air quality emissions that could exceed thresholds. Therefore, construction activities for all the thresholds have the potential to result in significant impacts and will be evaluated for all program elements in the EIR/EIS at a program level. Operation of WRP process optimization and solids processing would unlikely emit air quality emissions that could exceed thresholds due to the nature of the program (e.g., wastewater operation). However, the air quality analysis will evaluate operational activities for all program elements (except the conveyance system improvements and WRP effluent management as discussed below) for all thresholds in the EIR/EIS at a program level.

**Conveyance System.** Conveyance improvements and associated construction could occur at any point, on an as-needed basis, between 2018 and the buildout year of 2050. The scope and exact location of these improvements have yet to be defined; therefore, it is too speculative to quantify construction-related emissions for activities that would occur over the next 40 years. Construction equipment used at that time would comply with applicable air quality standards and requirements. Therefore, construction impacts are considered less than significant, and this issue will not be addressed in the EIR/EIS at the program level. There would be no operational emissions or impacts associated with conveyance system improvements because operation of the conveyance system is passive in nature and would not generate air pollution. Therefore, impacts would not occur, and this issue will not be addressed in the EIR/EIS at the program level.

Potential sources of odors during construction activities would arise from equipment exhaust. Odors from these sources would be localized and generally confined to the construction site. The conveyance system construction would utilize typical construction techniques, and the odors would be typical of most construction sites. Additionally, the odors would be temporary, occurring when equipment is operating. Construction activities associated with the conveyance system would be required to comply with the South Coast Air Quality Management District's Nuisance Rule 402 and, as such, would not create a significant level of objectionable odors. Potential impacts during construction would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level. The Sanitation Districts has an extensive odor control program to strategically control odors from the conveyance system throughout the JOS. The existing odor control program would continue to be in place during the future conveyance system improvements identified under the program, minimizing any odor impacts. Potential impacts during operation of conveyance system improvements would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

**WRP Effluent Management.** There is no construction associated with WRP effluent management. During operations, there may be an increase or decrease in treated effluent discharged into the receiving waters at each WRP under effluent management. The effluent would be discharged through existing discharge points and pipes. WRP effluent management would not have the potential to create objectionable odors because wastewater is treated to a tertiary level at the WRPs, at which point all odors are removed. The effluent is then beneficially reused or discharged into receiving waters. Therefore, WRP effluent management would not result in construction or operation emissions, and impacts would not occur under any of the thresholds. This issue will not be addressed in the EIR/EIS at the program level.

## Air Quality Project Discussion

**AQ-1 to AQ-6. Overall Determination: Potentially Significant Impact.** All project elements would emit emissions during construction and operation that could exceed thresholds. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** Construction of all project elements has the potential to emit air quality emissions that could exceed thresholds. Emissions will be calculated in the EIR/EIS for individual construction activities (e.g., shaft construction, offshore and onshore tunneling, riser and diffuser area construction, etc.). Peak daily emissions will then be determined by summing emissions from overlapping construction activities. Therefore, construction activities for all project elements and thresholds have the potential to result in significant impacts and will be evaluated in the EIR/EIS at a project level. Operation of the project is unlikely to emit air quality emissions that could exceed thresholds because once operational, wastewater would be conveyed via gravity and discharged to the Pacific Ocean. However, operational activities for all thresholds for all project elements will be evaluated in the EIR/EIS at a project level.

## Biological Resources Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **IV.** | **BIOLOGICAL RESOURCES (TERRESTRIAL).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| BIO-1. | Result in direct or indirect impacts to riparian habitats or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or U.S. Fish and Wildlife Service (USFWS)? | ☒ | ☐ | ☐ | ☐ | ☐ | ☒ |
| BIO-2. | Result in direct or indirect take of a federally listed, threatened, or endangered plant or wildlife species? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| BIO-3. | Result in direct or indirect take of a state listed, threatened, or endangered plant or wildlife species? | ☒ | ☐ | ☐ | ☐ | ☒ | ☐ |
| BIO-4. | Result in direct or indirect impacts to designated critical habitat for any state or federally listed threatened or endangered plant or wildlife species? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| BIO-5. | Result in direct or indirect impacts to any CDFG wildlife species of special concern? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| BIO-6. | Result in direct or indirect impacts to any rare, endemic, or regionally sensitive plants on California Native Plant Society (CNPS) Lists 1 or 2? | ☐ | ☒ | ☐ | ☐ | ☒ | ☐ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **IV.** | **BIOLOGICAL RESOURCES (TERRESTRIAL).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| BIO-7. | Result in direct or indirect impacts to any habitat conservation plans (HCPs), natural community conservation plan (NCCP), or other approved local, regional, or state HCPs? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| BIO-8. | Result in direct or indirect impacts on wetlands, waters, or special aquatic habitats regulated by the Corps, CDFG, CCC, RWQCB, or the County of Los Angeles? | ☒ | ☐ | ☐ | ☐ | ☐ | ☒ |
| BIO-9. | Directly or indirectly interfere with the movement of any freshwater fish or terrestrial wildlife species through impacts to or reduction in quality of a documented wildlife corridor or habitat linkage? | ☒ | ☐ | ☐ | ☐ | ☒ | ☐ |
| BIO-10. | Conflict with any other federal, state, or local policies or ordinances protecting biological resources? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Biological Resources Program

### Methodology and Screening Results

A literature review was conducted to identify special-status biological resources known to occur within and in the vicinity of the program (and project) area. Special-status resources include federally and state-listed threatened and endangered species identified as candidates for federal or state listing, state sensitive species, state fully protected species, plant species with a California Native Plant Society (CNPS) ranking, and depleted natural communities. Literature reviewed included the California Natural Diversity Database (CNDDB) Rarefind 4 application (CDFG 2011a), and the CNPS Rare and Endangered Vascular Plants of California (CDFG 2011a). A query of the CNDDB and CNPS was performed for the U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles associated with the program locations. The specific quadrangles queried included El Monte, Baldwin Park, San Dimas, Whittier, Los Alamitos, Seal Beach, and Long Beach. A summary of the query results is provided in Table 3-1. It should be noted that additional special-status species are included in Table 3-1 if judged to have a potential to occur based on reports of occurrence on other adjacent quadrangles, personal knowledge, and experience with prior projects in the region.

On February 4, 2010, ICF biologist Mikael Romich conducted a field visit to the SJCWRP, WNWRP, LBWRP, POWRP, and the JWPCP East and West shaft sites. In addition, discharge locations and the surrounding area were visited for the SJCWRP and WNWRP, and areas downstream of the POWRP.

**Table 3-1. Program Analysis Special-Status Plants and Animals Screening Table**

| Program Facility | Species | Classification | Location of Identification Relative to the Program Facility | Level of Impact Relative to Program Components |
|---|---|---|---|---|
| JWPCP | Palos Verdes Blue Butterfly | Federally Endangered<br>State Endangered | The specific location is not identified within the 0.25-mile buffer, but the facility is within the range identified. However, the range of this species is on the other side of I-110, and the site does not support host plants. | Construction disturbance is separated from species range by the I-110. Impacts would be less than significant |
| | Pocketed Free-Tailed Bat (*Nyctinomops femorosaccus*) | California Species of Special Concern | Not known in the vicinity. However, buildings to be demolished offer potential roost habitat. | The building demolition would result in potentially significant impacts. |
| | Mud Nama (*Nama stenocarpum*) | CNPS List 2.2 | The JWPCP is within the range of this species. However, there are no wetlands in the vicinity of the facility that would support this species. | There are no suitable conditions for this plant. No impacts would occur. |
| | Coulter's Goldfields (*Lasthenia glabata*) | CNPS List 1B.1 | The JWPCP is within the range of this species. However, there are no wetlands in the vicinity of the facility that would support this species. | There are no suitable conditions for this plant. No impacts would occur. |

**Table 3-1 (Continued)**

| Program Facility | Species | Classification | Location of Identification Relative to the Program Facility | Level of Impact Relative to Program Components |
|---|---|---|---|---|
| SJCWRP | Western Yellow Billed Cuckoo | Federal Candidate<br>State Threatened | The range is located within the 0.25-mile buffer, upstream of the project along the San Gabriel River. | Changes in flow in San Gabriel River would not affect the habitat upstream. Impacts would be less than significant. |
| | Least Bell's Vireo | Federal Endangered<br>State Endangered | Riparian vegetation occurs in unlined channel segments. | If effluent reduction were to alter the riparian habitat, impacts on this species would be potentially significant. |
| POWRP | Intermediate Mariposa-Lily | Special Vascular Plants, Bryophytes, and Lichens List. CNPS List 1 B.2 | The range is located in the 0.25-buffer and extends east outside the buffer. | Program components (construction and effluent management) would not impact this species. No impacts would occur. |
| | Many-Stemmed Dudleya (*Dudleya multicaulis*) | CNPS List 1 B.2 | The range is located in the 0.25-mile buffer and extends east outside the buffer. | Program components (construction and effluent management) would not impact this species. No impacts would occur. |
| LBWRP | Tricolored Blackbird | CDFG Species of Special Concern | Located within the 0.25-mile buffer. The range is limited to an area outside the facility (on the golf course located on other side of I-605). | Construction on the facility site would not impact this species. Impacts would be less than significant. |
| | Western Pond Turtle | CDFG Species of Special Concern | The specific location is not identified within the 0.25-mile buffer. However, Coyote Creek and San Gabriel River are within the range for this species. | Changes in the amount of discharge would result in potentially significant impacts. |
| | Coast Horned Lizard | CDFG Species of Special Concern | The specific location is located outside the facility but within the 0.25-mile buffer. However, the range of this species at this location is on the other side of I-605. | Construction of storage tank for process optimization would not significantly disturb this species. Impacts would be less than significant. |
| | Southern Tarplant | CNPS List 1B.1 | The range is located within the 0.25-mile buffer, but the range extends away from the facility. It is unlikely that the southern tarplant will be located on the facility property. | Program components would not impact the species. Impacts would be less than significant. |
| WNWRP | Coast California Gnatcatcher | Federally Threatened | The range is located within the 0.25-mile buffer. | The program components only include changes to effluent management. No impacts would occur. |
| | Least Bell's Vireo | Federal Endangered<br>State Endangered | Riparian vegetation occurs in unlined channel segments. | If effluent reduction were to alter the riparian habitat, impacts on this species would be potentially significant. |

The general biological setting for each program facility location is described under Impact BIO-1. Because habitats and inhabiting species are interconnected, the biological setting under BIO-1 provides a discussion of listed species in addition to the threshold-specific riparian plant community. Subsequent thresholds refer back to the biological setting discussed in Impact BIO-1 if relevant or if it highlights additional information specific to the threshold. The terminology in the analysis refers to short-term

direct and indirect impacts, which typically refer to construction impacts, and long-term direct and indirect impacts, which typically refer to operational impacts. Generally, short-term direct and indirect impacts are discussed first for each program element followed by long-term direct and indirect impacts.

## Biological Resources Program Discussion

**BIO-1. Overall Determination: Potentially Significant Impact.** Construction of all program elements would not significantly impact the riparian plant community and will not be addressed in the EIR/EIS at the program level. Operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could significantly impact the riparian plant community. Therefore, operational impacts related to these specific program elements will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Improvements to the conveyance system were not analyzed at a project-specific level because they have not been identified adequately to evaluate potential impacts. The improvements would be underground, in the public rights-of-way in existing streets, and are not expected to disturb habitat above ground. However, the conveyance system improvements may impact overlapping riparian habitat or jurisdictional aquatic features. Therefore, improvements to the conveyance system should evaluate the potential for direct impacts on jurisdictional waters on a case-by-case basis as specific conveyance improvements are designed in subsequent CEQA documents. No other direct impacts as a result of improvements to the conveyance system are anticipated. Improvements to the conveyance system have the potential to indirectly impact adjacent special-status wildlife species. Therefore, improvements to the conveyance system should also evaluate the potential for indirect impacts on special-status wildlife species on a case by case basis when specific locations and improvements have been identified in subsequent CEQA documents.

Under operation, the conveyance system would be underground and would convey, via gravity, wastewater from points of origin (i.e., businesses and homes) to the WRPs or JWPCP for treatment. Therefore, direct and indirect impacts on special-status wildlife species, riparian habitat, or other sensitive biological communities would not occur during operation of the conveyance system and will not be addressed in the EIR/EIS at the program level.

**WRPs - Plant Expansion and Process Optimization.** The proposed construction footprint for the SJCWRP plant expansion and process optimization would be located in an existing turfed lawn area and an existing developed area. There are no riparian plant communities or special-status biological resources within the lawn or developed areas. Therefore, direct construction impacts on riparian plant communities or special-status biological resources would not occur and will not be addressed in the EIR/EIS at the program level. However, the construction footprint would be close enough to riparian habitat that indirect impacts from construction noise and activity could result in a significant impact on the least Bell's vireo and various other species. Therefore, indirect impacts will be addressed in the EIR/EIS at the program level as identified in BIO-2 and BIO-3. The indirect impacts associated with the operation and maintenance of the expanded plant and process optimization at the SJCWRP would contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition. Therefore, long-term indirect impacts of operation on riparian plant communities and special-status

biological resources are considered less than significant and will not need to be addressed in the EIR/EIS at the program level.

The proposed construction footprint for process optimization at the POWRP would occur within an area that is currently developed. This currently developed area does not support any riparian plant communities or special-status biological resources. Therefore, direct construction and operational impacts on special-status biological resources or riparian plant communities would not occur and will not be addressed in the EIR/EIS at the program level. Construction of process optimization at the POWRP would occur within 10 feet of vegetation associated with Elephant Hill. The habitat adjacent to the process optimization is predominantly non-native grassland with occasional shrubs typical of a chaparral community and scattered walnut trees. One of the special-status wildlife species that could potentially occupy habitat in the area is the federally listed (threatened) coastal California gnatcatcher; however, it has a low likelihood of occupying this habitat due to the predominance of non-native grass. Therefore, indirect impacts of construction on California gnatcatcher are considered less than significant. A potentially jurisdictional channel that supports walnuts occurs immediately adjacent to and west of the process optimization footprint. Indirect impacts of construction on this jurisdictional feature is considered less than significant since all direct disturbance is limited to the construction footprint area. Therefore, indirect impacts on special-status biological resources or riparian plant communities as a result of construction would be considered less than significant and will not be addressed in the EIR/EIS at the program level.

The indirect impacts associated with the operation and maintenance of process optimization would contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition. Therefore, long-term indirect impacts of operation and maintenance of process optimization at the POWRP are considered less than significant and will not be addressed in the EIR/EIS at the program level. Two rare plants, the intermediate Mariposa lily and the many-stemmed dudleya (CNPS List 1B.2 species), occur approximately 0.2 mile from the POWRP facility. Since construction would be limited to a developed area within the POWRP facilities, neither of these plant species would be affected; therefore, they will not be addressed in the EIR/EIS at the program level.

The proposed footprint for process optimization at the LCWRP would occur within an area that is currently vegetated with turf grass as part of an existing driving range. A golf course is located to the north and west. Riparian plant communities or special-status biological resources are not located within the process optimization footprint and do not occur adjacent to the footprint. Therefore, no potential indirect construction impacts would occur on special-status biological resources or riparian plant communities and will not be addressed in the EIR/EIS at the program level. The increase in indirect impacts associated with the operation and maintenance of process optimization at the LCWRP would contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition. Therefore, potential long-term indirect impacts of operation and maintenance of process optimization on special-status biological resources or riparian plant communities would not occur and will not be addressed in the EIR/EIS at the program level.

The proposed footprint for process optimization at the LBWRP would occur within an area that is currently a ruderal field with some ornamental landscaping. There are no riparian plant communities within this area or adjacent to it. The existing degraded ruderal plant community has a low potential for the southern tarplant to occur. Therefore, impacts on this species and other special-status plant species would be considered less than significant and will not be addressed in the EIR/EIS at the program level. Developed areas associated with the LBWRP occur to the north, south, and east of the process optimization footprint. To the west is a city of Long Beach debris catch basin that appears to be heavily managed. During a field investigation on February 2010, the site appeared to be recently disturbed and

was comprised of mostly bare ground. No special-status biological resources are expected to occur within the debris catch basin or construction footprint. Therefore, potential indirect impacts of construction on special-status biological resources or riparian plant communities are considered less than significant and will not be addressed in the EIR/EIS at the program level. The indirect impacts associated with the operation and maintenance of process optimization would contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition. Therefore, long-term indirect impacts of operation and maintenance of process optimization at the LBWRP on special-status biological resources or riparian plant communities are considered less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs – Effluent Management.** There is no construction proposed as part of WRP effluent management; therefore, construction impacts would not occur. Changes in the amount and timing of effluent being discharged to San Jose Creek and the San Gabriel River from the POWRP and SJCWRP have the potential to have a significant indirect impact on riparian plant communities and several special-status biological resources through potential changes in the structure and extent of riparian habitat. Potentially impacted species include: least Bell's vireo, yellow warbler, yellow-breasted chat, and western pond turtle. Therefore, potential indirect impacts on riparian habitat and these dependent special-status biological resources will be addressed in the EIR/EIS at the program level. Changes in the amount and timing of effluent being discharged from the WNWRP to the San Gabriel River, Zone 1 Ditch, and Rio Hondo have the potential to have a significant impact on riparian plant communities and several special-status species, including least Bell's vireo, yellow warbler, yellow-breasted chat, and western pond turtle. Potential indirect impacts on riparian plant communities and dependent, special-status species will be addressed in the EIR/EIS at the program level.

Changes in the amount and timing of effluent being discharged from the LCWRP into the San Gabriel River do not have the potential to have a significant impact on riparian plant communities or other special-status biological resources because this segment of the receiving water is a concrete-lined channel. Likewise, changes in the amount and timing of effluent being discharged from the LBWRP into Coyote Creek and through to the San Gabriel River do not have the potential to have an impact on riparian plant communities or other special-status biological resources because the receiving waters are in a concrete-lined channel.

It is unlikely there would be changes in the distribution and abundance of non-native fish species (such as tilapia) that occur within the channel as a result of effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP because the Sanitation Districts manage the release of treated effluent from their WRPs in such a way that fish are not stranded. Furthermore, under CEQA, impacts on non-native fish would be considered less than significant because they are invasive and not considered a part of the natural habitat. However, these impacts will be addressed in the EIR/EIS at the program level since alterations in flow have the potential to significantly impact native fish species.

For piscivorous birds that may feed on non-native fish, changes in the availability of food could lead to changes in their feeding behavior. However, an overall reduction in the distribution of non-native fish is not expected to a have a measurable negative impact on piscivorous birds. Therefore, potential indirect impacts on piscivorous birds are considered less than significant and will not be addressed in the EIR/EIS at the program level. No potential indirect impacts on terrestrial wildlife species movement as a result of effluent management at the LCWRP and LBWRP are expected as releases would occur in a concrete channel. No other potentially significant indirect impacts on special-status biological resources as a result of effluent management have been identified.

**JWPCP.** The proposed footprint for the digesters, which would be constructed for solids processing, would be located within the JWPCP, an area that is currently developed. This developed area does not support any riparian plant communities or special-status biological resources. The JWPCP is located within 0.25 mile of the known range of the Palos Verdes blue butterfly, a federally and state-listed endangered species. However, the range of this species is separated from the JWPCP facilities by a major highway (I-110). Therefore, the potential for impacts on this species is less than significant and will not be addressed in the EIR/EIS. West of the digesters are natural areas associated with the Wilmington Drain. However, no indirect impacts are expected, as this area is over 600 feet away and is separated from the solids processing digester construction area by the I-110. The Bixby Marsh is located north of the JWPCP. However, no indirect impacts are expected because this area is over 1,000 feet away and is separated from the solids processing digester construction area by existing JWPCP infrastructure. One species of special concern, the pocketed free-tailed bat, occurs in a range within 0.25 mile of the JWPCP site, and could potentially roost on existing JWPCP structures. Potential impacts on this species will be evaluated in the EIR/EIS at the program level as identified in BIO-5. No other special-status biological resources are expected to occur within the solids processing digester construction footprint. The indirect impacts associated with the operation and maintenance of the proposed solids processing digesters are expected to contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition. Therefore, operation and maintenance impacts associated with solids processing are not expected to occur, and this issue will not be addressed in the EIR/EIS at the program level.

Implementation of biosolids management would increase the quantity of biosolids at the JWPCP. This would also increase composting, land application, and activities at landfills within the JOS service area and areas outside the JOS service area. The land applications and beneficial use locations generally would be in areas dominated by agriculture or in light industrial/commercial areas. The actual land use application or beneficial use would occur on existing agricultural land or in existing buildings. The Sanitation Districts would only use sites that are properly permitted and for which all site-specific impacts, including the potential to affect special-status biological resources, have been mitigated through either preparation of site-specific environmental documents or compliance with other federal, state, and local regulations. Therefore, operation of biosolids management at the JWPCP and at beneficial use locations would not have an impact on riparian plant communities or special-status biological resources and will not be addressed in the EIR/EIS at the program level.

**BIO-2. Overall Determination: Potentially Significant Impact.** Construction of plant expansion and process optimization at the SJCWRP and operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could significantly impact federally endangered species. Therefore, impacts related to these specific program elements will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** As described under BIO-1 (Program), improvements to the conveyance system would be evaluated on a case-by-case basis, once specific improvements have been designed. This would include an analysis of potential impacts from construction on federally listed threatened or endangered species. The conveyance system would be underground and during operations would convey, via gravity, wastewater from points of origin to the WRPs or JWPCP for treatment. Therefore, direct and indirect

impacts on special-status wildlife species would not occur during operation of the conveyance improvements and will not be addressed in the EIR/EIS at the program level.

**WRPs.** As described under BIO-1 (Program), there is a probability of coastal California gnatcatcher presence in the undeveloped habitat adjacent to the POWRP. However, the probability of occurrence is sufficiently low, based on predominance of non-native grass, and indirect construction and operational impacts on this species would be less than significant. Therefore, construction and operation of process optimization at the POWRP would not have a significant impact on this federally listed endangered species and will not be addressed in the EIR/EIS at the program level.

As described under BIO-1 (Program), the federally listed least Bell's vireo may nest in riparian areas adjacent to the SJCWRP and could potentially be significantly impacted by noise and activity associated with construction of plant expansion or process optimization at the SJCWRP; this issue will be addressed in the EIR/EIS at the program level. None of the other WRPs have federally listed endangered species located within the WRP or adjacent to the construction areas and, therefore, direct or indirect impacts associated with construction or operation of process optimization at the POWRP, LCWRP, or LBWRP would not occur and will not be addressed in the EIS/EIS at the program level.

WRP effluent management would have potentially significant impacts on federally endangered species as identified in BIO-1 and this will be addressed in the EIR/EIS at the program level.

**JWPCP.** As described under BIO-1, construction at the JWPCP would be located distant from, and on the opposite side of I-110, the known range of the Palos Verdes blue butterfly. Therefore, the construction and operation of solids processing facilities would have no impact on this federally listed endangered species.

**BIO-3. Overall Determination: Potentially Significant Impact.** Construction of plant expansion and process optimization at the SJCWRP and operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could significantly impact state-listed species. Therefore, impacts related to these specific program elements will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See analysis under BIO-1 (Program) and BIO-2 (Program), which is applicable to this threshold. Impacts on state-listed species would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See analysis under BIO-1 (Program) and BIO-2 (Program) for plant expansion and process optimization at the SJCWRP; process optimization at the POWRP, LCWRP, and LBWRP; and WRP effluent management at all WRPs, which is applicable to this threshold. In addition to what is disclosed in BIO-1 and BIO-2 regarding WRP effluent management from the SJCWRP and POWRP, the range of the western yellow billed cuckoo, a state-listed threatened species, includes a portion of the San Gabriel River upstream of the mouth of San Jose Creek within 0.25 mile upstream of the SJCWRP and about 12 miles downstream of the POWRP. Since WRP effluent management would not affect flows upstream of existing outfalls, and the channel downstream of the POWRP is primarily concrete-lined, the potential

for impacts on this species as part of WRP effluent management from POWRP or SJCWRP would be less than significant and will not be addressed in the EIR/EIS at the program level. However, plant expansion and process optimization at the SJCWRP, and effluent management at the SJCWRP, POWRP, and WNWRP would have the potential to have a significant impact on least Bell's vireo and will be addressed in the EIR/EIS at the program level.

**JWPCP.** As described under BIO-1 (Program) and BIO-2 (Program), the potential for construction of the solids processing digesters at the JWPCP to impact the federally and state-listed endangered Palos Verdes blue butterfly is less than significant and will not be addressed in the EIR/EIS at the program level. No other state-listed endangered, threatened plant or wildlife species are known to occur within range of the JWPCP digester construction footprint. Therefore, impacts on state-listed species would be less than significant and will not be addressed in the EIR/EIS at the program level.

**BIO-4. Overall Determination: No Impact.** No impacts would occur during construction or operation on critical habitat as a result of the program elements. Therefore, this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See analysis under BIO-1 (Program) and BIO-2 (Program), which is applicable to this threshold. Impacts would not occur on critical habitat and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See analysis under BIO-1 (Program) and BIO-2 (Program) for plant expansion and process optimization at the SJCWRP; process optimization at the POWRP, LCWRP, and LBWRP; and WRP effluent management at all WRPs, which is applicable to this threshold. In addition to what is disclosed in BIO-1 and BIO-2, designated critical habitat for the coastal California gnatcatcher currently occurs south of the WNWRP. However, the designated critical habitat area is on the opposite side of San Gabriel Boulevard, a major arterial, from the WNWRP and would be unaffected by program-related construction and effluent management. Therefore, this issue will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See analysis under BIO-1 (Program) and BIO-2 (Program), which is applicable to this threshold. Impacts would not occur on critical habitat because there is no designated critical habitat at the JWPCP and, therefore, this issue will not be addressed in the EIR/EIS at the program level.

**BIO-5. Overall Determination: Potentially Significant Impact.** Construction and operation of several program elements could significantly impact California Department of Fish and Game (CDFG) wildlife species of special concern. Therefore, impacts related to these specific program elements will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See analysis under BIO-1 (Program) and BIO-2 (Program), which is applicable to this threshold. Impacts would not occur on critical habitat and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See analysis under BIO-1 (Program) and BIO-2 (Program) for plant expansion and process optimization at the SJCWRP; process optimization at the POWRP, LCWRP, and LBWRP; and WRP effluent management at all WRPs, which is applicable to this threshold. Impacts associated with WRP effluent management at all WRPs on the following special-status species of concern would be potentially significant and will be addressed in the EIR/EIS at the program level: western pond turtle, yellow warbler, and yellow-breasted chat.

**JWPCP.** As described under BIO-1 (Program), the pocketed free-tailed bat (California special-status species of concern) could exist on structures at the JWPCP; potentially significant impacts on this special-status species of concern will be addressed in the EIR/EIS at the program level.

**BIO-6. Overall Determination: Less Than Significant Impact.** Impacts would not occur on any sensitive plant species during construction or operation. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See analysis under BIO-1 (Program) and BIO-2 (Program), which is applicable to this threshold. Impacts would not occur to critical habitat and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See analysis under BIO-1 (Program) and BIO-2 (Program) for plant expansion and process optimization at the SJCWRP; process optimization at the POWRP, LCWRP, and LBWRP; and WRP effluent management at all WRPs, which is applicable to this threshold. In addition to the information disclosed in BIO-1 and BIO-2, rare plant species mapped as occurring in the vicinity of the POWRP include the many-stemmed dudleya and intermediate Mariposa lily. Both plant species have been mapped as occurring approximately 0.2 mile from the POWRP facilities. However, these species would

not be found in the developed, landscaped, or ruderal areas within the construction footprint. Therefore, there would be no impact, and these species will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The mud nama and Coulter's goldfields have been mapped as occurring within 0.8 mile of the JWPCP facilities. However, these species would not be found in the developed areas within the JWPCP facilities; therefore, there would be no impact, and these species will not be addressed in the EIR/EIS at the program level.

**BIO-7. Overall Determination: No Impact.** Construction and operation of all program elements would not impact a natural community conservation plan (NCCP) or habitat conservation plan (HCP). Therefore, this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Currently, there is one NCCP in Los Angeles County (CDFG 2012), the Palos Verdes Peninsula NCCP. The Palos Verdes NCCP area (City of Rancho Palos Verdes 2006) does not overlap any of the program elements. No other HCPs or NCCPs are located in Los Angeles County (USFWS 2011a) that would overlap any areas affected by the program elements. Therefore, construction and operation of all program elements would not impact existing NCCPs or HCPs and will not be addressed in the EIR/EIS at the program level.

**BIO-8. Overall Determination: Potentially Significant Impact.** Construction of all program elements would not result in significant impacts and will not be addressed in the EIR/EIS at the program level. Operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could significantly impact wetlands, waters of the U.S., or aquatic habitat. Therefore, operational impacts related to these specific program elements will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See analysis under BIO-1 (Program) and BIO-2 (Program), which is applicable to this threshold. Construction and operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See analysis under BIO-1 (Program) for plant expansion and process optimization at the SJCWRP; process optimization at the POWRP, LCWRP, and LBWRP; and WRP effluent management at all WRPs, which is applicable to this threshold. Construction and operational impacts for plant expansion and process optimization at the SJCWRP, and process optimization at the POWRP, LCWRP, and LBWRP would be less than significant and will not be addressed in the EIR/EIS at the program level. Operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could be potentially significant and will be addressed in the EIR/EIS at the program level.

**JWPCP.** See analysis under BIO-1 (Program), which is applicable to this threshold. Impacts would not occur because there is no aquatic habitat within the proposed construction or operation footprint of solids processing at the JWPCP, or adjacent to the footprint of solids processing and, therefore, will not be addressed in the EIR/EIS at the program level.

**BIO-9. Overall Determination: Potentially Significant Impact.** As discussed in BIO-1, impacts on movement of freshwater non-native fish species and terrestrial wildlife species could occur as a result of WRP effluent management at the SJCWRP, POWRP, and WNWRP. Impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See analysis under BIO-1 and BIO-2 (Program), which is applicable to this threshold. Construction and operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See analysis under BIO-1 (Program) for plant expansion and process optimization at the SJCWRP; process optimization at the POWRP, LCWRP, and LBWRP; and WRP effluent management at all WRPs, which is applicable to this threshold. Construction and operational impacts for plant expansion and process optimization at the SJCWRP, and process optimization at the POWRP, LCWRP, and LBWRP would be less than significant and will not be addressed in the EIR/EIS at the program level. Operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could result in potentially significant impacts on movement of freshwater non-native fish species and terrestrial wildlife species within San Jose Creek, the San Gabriel River, the Rio Hondo, and the San Gabriel Tidal Prism and will be addressed in the EIR/EIS at the program level.

**JWPCP.** See analysis under BIO-1 (Program), which is applicable to this threshold. Impacts would not occur because there is no aquatic habitat within the proposed construction or operation footprint of solids processing at the JWPCP, or adjacent to the footprint of solids processing, and, therefore, will not be addressed in the EIR/EIS at the program level.

**BIO-10. Overall Determination: Potentially Significant Impact.** Construction of the conveyance improvements, plant expansion and process optimization at the WRPs and solid processing at the JWPCP would be potentially significant. Therefore, impacts related to these specific program elements will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The federal Migratory Bird Treaty Act and Fish and Game Code protect nests of native birds during nesting season. Generally, if trees or other suitable nesting habitat are within proximity of the construction sites, native birds during nesting season can be disturbed due to noise, dust, and emissions, and this disturbance can be a violation of the federal Migratory Bird Treaty Act and Fish and Game Code. Therefore, construction of the conveyance system will be addressed in the EIR/EIS at the program level. The indirect impacts associated with the operation and maintenance of the conveyance system would contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction for plant expansion and process optimization at the SJCWRP, and process optimization at the POWRP and LBWRP could result in potentially significant impacts on nesting birds. Therefore, potentially significant impacts will be addressed in the EIR/EIS at the program level. The indirect impacts associated with the operation and maintenance of process optimization and the plant expansion would contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition. Likewise, construction at the LCWRP would take place in an area that is either developed or in use as part of a golf driving range. The current recreational use involves frequent motion due to golfing activity and turf maintenance. As a result, the construction area associated with the LCWRP provides negligible biological value. Therefore, long-term indirect impacts of operation and maintenance at the WRPs are considered less than significant and will not be addressed in the EIR/EIS at the program level. Construction would not occur as part of WRP effluent management; therefore, construction impacts would not occur. The WNWRP is located adjacent to a designated Significant Ecological Area (SEA). Due to the close proximity to a designated SEA, effluent management at the WNWRP could result in potentially significant impacts on the biological resources available at the SEA and, therefore, will be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction of solids processing facilities would not result in impacts because the entire construction footprint and surrounding area is completely developed with no pervious surfaces, vegetation, or wildlife habitat. There would be no construction associated with biosolids management and, therefore, impacts would not occur. The indirect impacts associated with the operation and maintenance of the solids processing digesters and biosolids management would contribute a negligible amount of additional noise, dust, and motion when compared to the existing condition.

## Biological Resources Project

### Methodology and Screening Results

A CNDDB search was conducted for each of the onshore project element locations as a preliminary search to identify the potential for biological resources. Searches were initially conducted on November 16, 2009, and verified on April 15, 2011; identified species are listed in Table 3-2. The search area included a 0.25-mile radius around each shaft site. Plant populations within 0.5 mile of each other are considered as one occurrence. As described in the program discussion for biological resources, because the variation in a species' range is determined by the accuracy of the data submitted to the CNDDB, the location of a project element within a species' range does not mean that the species necessarily occurs within that location, nor does it guarantee a species is not present at the location. Therefore, the CNDDB search was also conducted for the USGS San Pedro and Torrance quadrangles (USGS 2009a, 2009b) to determine species occurrences near the shaft sites.

An additional database search was conducted to determine if the species identified in the CNDDB are rare, endemic, or regionally sensitive plants on CNPS Lists 1 or 2. The information from the CNDDB and the CNPS database searches is presented in Table 3-2. In February 2010, ICF biologist James

Hickman visited the TracPac, LAXT, Southwest Marine, Angels Gate, and Royal Palms shaft sites and ICF biologist Mike Romich visited the JWPCP East and JWPCP West shaft sites.

**Table 3-2. Project Analysis Special-Status Plants and Animals Screening Table**

| Project Facility | Species | Classification | Location of Identification Relative to the Project Facility | Level of Impact Relative to Project Components |
|---|---|---|---|---|
| JWPCP East | Palos Verdes Blue Butterfly | Federally Endangered<br>State Endangered | The specific location is not identified within the 0.25-mile buffer, but the facility is within the range identified. However, potential impacts for host plants at this site very low. | Impacts due to construction disturbance would be less than significant. |
| | Mud Nama (*Nama stenocarpum*) | CNPS List 2.2 | The JWPCP is within the range of this species. However, there are no wetlands in the vicinity of the facility that would support this species. | There are no suitable conditions for this plant. No impacts would occur. |
| | Coulter's Goldfields (*Lasthenia glabata*) | CNPS List 1B.1 | The JWPCP is within the range of this species. However, there are no wetlands in the vicinity of the facility that would support this species. | There are no suitable conditions for this plant. No impacts would occur. |
| JWPCP West | Palos Verdes Blue Butterfly | Federally Endangered<br>State Endangered | The specific location is not identified within the 0.25-mile buffer, but the facility is within the range identified. However, potential for host plants at this site very low. | Impacts due to construction disturbance would be less than significant. |
| | Mud Nama | CNPS List 2.2 | The JWPCP is within the range of this species. However, there are no wetlands in the vicinity of the facility that would support this species. | There are no suitable conditions for this plant. No impacts would occur. |
| | Coulter's Goldfields | CNPS List 1B.1 | The JWPCP is within the range of this species. However, there are no wetlands in the vicinity of the facility that would support this species. | There are no suitable conditions for this plant. No impacts would occur. |
| | Pocketed Free-Tailed Bat (*Nyctinomops femorosaccus*) | California Species of Special Concern | The presumed extant occurs west of I-110. The species is not known to occur within the project vicinity. | The shaft construction would not involve potential roosts or other habitat. No impacts would occur. |
| TraPac | Palos Verdes Blue Butterfly | Federally Endangered<br>State Endangered | The specific location is not identified within the 0.25-mile buffer, but the facility is within the range identified. However, there is no vegetation on the site. Therefore, there is no potential habitat for Palos Verde blue butterfly. | There is no vegetation at the site. No impacts would occur. |
| LAXT | Coast Woolly-heads | CNPS 1B.2 species | The specific location is not identified within the 0.6-mile buffer, but the facility is within the range identified. There is a low probability of occurrence at this site due to ground disturbance and landscaping. | Impacts due to construction disturbance would be less than significant. |

**Table 3-2 (Continued)**

| Project Facility | Species | Classification | Location of Identification Relative to the Project Facility | Level of Impact Relative to Project Components |
|---|---|---|---|---|
| Southwest Marine | South Coast Saltscale | CNPS 1B.2 species | The specific location is not identified within the 1-mile buffer, but the facility is within the range identified. However, the site is entirely paved with no vegetation. | There is no vegetation at the site. No impacts would occur. |
| | Davidson's Saltscale | CNPS 1B.2 species | The specific location is not identified within the 1-mile buffer, but the facility is within the range identified. However, the site is entirely paved with no vegetation. | There is no vegetation at the site. No impacts would occur. |
| | Estuary Seablite | CNPS 1B.2 species | The specific location is not identified within the 1-mile buffer, but the facility is within the range identified. However, the site is entirely paved with no vegetation. | There is no vegetation at the site. No impacts would occur. |
| Angels Gate | Lyon's Pentacheata | CNPS 1B.1 species | The specific location is not identified within the 0.20-mile buffer, but the facility is within the range identified. However, the site is either paved or turf. Therefore, the probability of occurrence is very low. | Impacts due to construction disturbance would be less than significant. |
| | Island Green Dudleya | CNPS 1B.2 species | The specific location is not identified within the 0.20-mile buffer, but the facility is within the range identified. However, the site is either paved or turf. Therefore, the probability of occurrence is very low. | Impacts due to construction disturbance would be less than significant. |
| | Peregrine Falcon | Federally Delisted<br>State Fully Protected Species | Peregrine falcon was observed over sea bluffs approximately 500 feet southwest of the project site during site visit. | Impacts due to construction disturbance would be potentially significant. |
| | Burrowing Owl | State Species of Special Concern | There is a potential for occurrence of the species within ground squirrel burrows on site. | Impacts due to construction disturbance would be potentially significant. |
| Royal Palms | Coastal Bluff Scrub Habitat | | This area is mapped as coastal scrub habitat. However, the construction footprint is developed or composed ruderal vegetation. | Impacts due to construction disturbance would be potentially significant. |
| | Island Green Dudleya | CNPS Listed species | Specific range of this species occurs within 0.25-mile of the project site. The coastal bluff scrub community in the vicinity of the project footprint could support this species. | Impacts due to construction disturbance would be potentially significant. |
| | Palos Verdes Blue Butterfly | Federally Endangered<br>State Endangered | The specific location occurs within 0.25-mile of the range of this species. However, the potential for host plants at this site very low. | Impacts due to construction disturbance would be less than significant. |
| | California Coastal Gnatcatcher | Federally Threatened | The coastal bluff scrub habitat could support this species. | Impacts due to construction disturbance would be potentially significant. |

## Biological Resources Project Discussion

**Onshore Tunnel and Offshore Tunnel Alignments.** The onshore tunnels would be constructed more than 70 feet bgs, sometimes as deep as 450 feet. Biological resources would not be affected by the construction and operation of the onshore and offshore tunnels; therefore, they will not be addressed in the EIR/EIS at the project level. Furthermore, offshore tunnel alignment impacts on marine biological resources are discussed in Section XI (Marine Environment).

The general biological setting and presence of sensitive species for each project facility location is described in Impact BIO-1. Because habitat and species are interconnected, the biological setting under BIO-1 provides a discussion of listed species in addition to the threshold-specific riparian plant community. Subsequent thresholds refer back to the biological setting discussed in Impact BIO-1, if relevant or if it highlights additional information specific to the threshold. This analysis includes short-term direct and indirect impacts, typically from construction, and long-term direct and indirect impacts, typically from operation. Generally, construction impacts are discussed first for each project element and then operational impacts are discussed.

**BIO-1. Overall Determination: No Impact.** No riparian habitat or sensitive natural communities occur at any of the shaft site locations. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**Shaft Site – JWPCP East.** The proposed footprint for the JWPCP East shaft site occurs within an area that has been subject to regular and frequent disturbances. Based on aerial imagery, the site was completely developed in 1999. Between 1999 and 2002, structures on the site were demolished. By 2003, it appears that ruderal vegetation was beginning to colonize the site. Currently, the site is generally vacant with some remediation equipment in the general proximity. During the field visit, only early colonizing non-native grasses and other non-native annuals and forbs were observed on the project site. No riparian habitat or sensitive natural communities were observed on the site. Therefore, no short-term or long-term direct or indirect impacts on riparian habitat or sensitive natural communities from the JWPCP East would occur, and this issue will not be addressed in the EIR/EIS at the project level.

The ruderal vegetation and developed areas that currently exist on the project site are not expected to support any special-status biological resources. The JWPCP East shaft site is located in the range of the Palos Verdes blue butterfly, although the site is not within the identified buffer area of recorded observations of this species. Because the project site is dominated by ruderal vegetation and does not support coastal sage scrub vegetation community, the probability of the site supporting food plants for Palos Verdes blue butterflies is very low. Therefore, short-term or long-term direct or indirect impacts on sensitive natural communities or special-status biological resources that support them would not occur and will not be addressed in the EIR/EIS at the project level.

Residential and commercial development occurs to the south and east, and ruderal and developed areas occur to the north and west of the JWPCP East shaft site. Overall, no special-status biological resources are expected to occur adjacent to the JWPCP East shaft site footprint. Therefore, no short-term indirect impacts are expected to occur and will not be addressed in the EIR/EIS at the project level. Furthermore, because of the developed area surrounding the JWPCP East shaft site, no long-term indirect impacts on special-status biological resources from the JWPCP East shaft site would occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Site – JWPCP West.** The proposed footprint for the JWPCP West shaft site occurs within an area that has been subject to regular and frequent disturbances. Based on aerial imagery, the site was dominated by development in 2004. Between 2004 and 2010, the amount of ruderal vegetation has increased but the site remains dominated by both developed and barren areas. During the field visit, only early colonizing non-native grasses and other non-native annuals and forbs were observed on the project site. There was also one row of eucalyptus trees in the center of the site and a row of ornamental landscaping along the eastern border. No riparian habitat or sensitive natural communities were observed on the site. Therefore, no short-term or long-term direct or indirect impacts on riparian habitat or sensitive natural communities at the JWPCP West shaft site would occur, and this issue will not be addressed in the EIR/EIS at the project level.

The ruderal vegetation, ornamental landscaping, eucalyptus trees, and developed areas that currently exist on the project site are not expected to support any special-status biological resources. Interstate 110 occurs to the west, JWPCP to the north, ruderal areas to the south, and the Wilmington Athletic Complex to the east. Overall, no special-status biological resources are expected to occur adjacent to the JWPCP West shaft site footprint. The JWPCP West shaft site is located in the range of the Palos Verdes blue butterfly, although the site is not within the identified buffer area of recorded observations of this species. Because the project site is dominated by ruderal vegetation and does not support coastal sage shrub vegetation community, the probability of the site supporting food plants for Palos Verdes blue butterfly is very low. Therefore, short-term direct impacts on special-status biological resources would not occur at the JWPCP West shaft site and will not be addressed in the EIR/EIS at the project level. Furthermore, because of the developed area surrounding the shaft site, no long-term indirect impacts on special-status biological resources from operation at the JWPCP West shaft site have been identified, and this issue will not be addressed in the EIR/EIS at the project level.

**Shaft Site – TraPac.** The proposed footprint for the TraPac shaft site occurs within an area that is completely developed. Therefore, no short-term or long-term direct or indirect impacts on riparian habitat or sensitive natural communities would occur at the TraPac shaft site, and this issue will not be addressed in the EIR/EIS at the project level.

Because the area is fully developed, short-term and long-term direct and indirect impacts would not result on special-status biological resources at the TraPac shaft site, and this issue will not be addressed in the EIR/EIS at the project level. Developed areas occur to the east, west, and south. To the north exists Harry Bridges Boulevard with an active construction site farther north. Overall, no special-status biological resources are expected to occur adjacent to the TraPac shaft site footprint. Therefore, no short-term and long-term indirect impacts would occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Site – LAXT.** The proposed footprint for the LAXT shaft site occurs within an area that is mostly developed. The exception is an area with ruderal vegetation and ornamental landscaping that occurs along the western portion of the site. There is a row of eucalyptus trees (20 to 30 feet in height). There is also an area of open water, which appears to have been part of a water treatment process. Areas adjacent

to the site are mostly developed, but with ruderal and ornamental landscaping to the south. Species in this area include ice-plant (*Carpobrotus chilensis*), telegraph weed (*Heterotheca grandiflora*), and filaree (*Erodium* sp.). Some landscape species that were also found include unknown ornamental pines (*Pinus* sp.), eucalyptus (*Eucalyptus* sp.), and blackwood acacia (*Acacia melanoxylon*). A few scattered mulefat (*Baccharis salicifolia*) were also observed here. A row of pine trees (20 to 30 feet in height) also occurs in the buffer to the south, along Terminal Way. Other large trees (predominantly eucalyptus) occur along Ferry Street and Terminal Way. No riparian or sensitive natural communities exist at the LAXT shaft site or surrounding it. Therefore, no short-term or long-term direct or indirect impacts on riparian habitat or sensitive natural communities at the LAXT shaft site would occur, and this issue will not be addressed in the EIR/EIS at the project level.

This site is within the mapped range of the federal- and state-listed endangered Palos Verdes blue butterfly, but outside of the 0.25-mile buffer from known occurrences. Because this site is entirely developed, it supports no habitat for the Palos Verdes blue butterfly. Therefore, the LAXT shaft site would not result in short-term and long-term direct or indirect impacts on special-status biological resources, and this issue will not be addressed in the EIR/EIS at the project level.

The LAXT shaft site is within the 0.6-mile buffer of occurrences of coast woolly-heads, a CNPS 1B.2 plant species. However, since the shaft site is virtually all developed land and does not support a coastal strand plant community, short-term and long-term direct or indirect impacts would not occur on this species and will not be addressed in the EIR/EIS at the project level.

**Shaft Site – Southwest Marine.** The proposed footprint for the Southwest Marine shaft site occurs within an area that is completely developed with concrete, asphalt, and a building (a small storage shed). No riparian habitat or sensitive natural communities were observed on the site. Therefore, no short-term or long-term direct or indirect impacts on riparian habitat or sensitive natural communities at the Southwest Marine shaft site would occur, and this issue will not be addressed in the EIR/EIS at the project level.

Typical Port of Los Angeles development surrounds the shaft site. Two piers with mechanical cranes occur just west of the site. Terminal Island Federal Correctional facility is located south of, and adjacent to, the site. This area was not accessible for a site visit, but is completely developed. Across Seaside Avenue, to the east of the Southwest Marine shaft site, is a boulder breakwater. The shaft site is located approximately 1.4 miles northwest of the documented least tern (special-status species) breeding colony. Within the Port of Los Angeles, developed areas can provide nesting opportunities for special-status species such as least tern. However, the Southwest Marine shaft site, and the area surrounding it, is not known to provide this function. Therefore, short-term direct impacts on special-status biological resources would not occur and will not be addressed in the EIR/EIS at the project level. The open water habitat of the port may occasionally provide foraging opportunities for piscivorous birds. During construction, birds may be less likely to forage for fish in the vicinity of the shaft site because of construction activities. However, the affected area would be small and the overall availability of fish would not be affected. Therefore, the project is not expected to result in any measurable negative impact on piscivorous birds. Overall, direct and indirect short-term and long-term impacts on special-status biological resources would be less than significant and will not be addressed in the EIR/EIS at the project level.

Approximately 8 to 10 brown pelicans (*Pelecanus occidentalis californicus*) were observed flying over the project area and/or perched on the breakwater during the field visit. In addition, a nest occurs in a light stand at the far end of the breakwater, approximately 900 feet from the shaft site at the closest point. The nest does not appear to be active, and the species is unknown. No access was available to this area.

The western portion of the breakwater occurs at the closest point approximately 400 feet from the shaft site. Besides brown pelicans, the only other wildlife species detected were California sea lion (*Zalophus californianus*) (swimming between the piers west of the site) and unknown gulls (*Larus* sp.). Gulls are commonly observed in close proximity to construction and other human activity and sea lions do not leave the water in the shaft site vicinity. Therefore, short-term indirect impacts would not occur to these species and, therefore, will not be addressed in the EIR/EIS at the project level.

**Shaft Site – Angels Gate.** The proposed footprint for the Angels Gate shaft site occurs within a park. The majority of the shaft site is on an asphalt parking lot. The rest of the site is dominated by grasses and other herbaceous species associated with the park. The majority of the park is mowed. No riparian or sensitive natural communities exist at Angels Gate shaft site or surrounding it. Therefore, no short-term or long-term direct or indirect impacts on riparian habitat or sensitive natural communities at the Angels Gate shaft site would occur. This issue will not be addressed in the EIR/EIS at the project level.

The species found in the turf identified at the park include non-native grasses and ruderal species (i.e., black mustard [*Brassica nigra*], wild radish [*Raphanus sativus*], cheeseweed [*Malva parviflora*], London rocket [*Sisymbrium irio*], and ripgut brome [*Bromus diandrus*]). A row of palms, both Mexican fan palm (*Washingtonia robusta*) and Canary Island date palm (*Phoenix canariensis*), occurs along Gaffey Street on the eastern edge of the site. Ground squirrels and their burrows were found throughout the site and buffer area on the north side of Del Mar Street. Although there are suitable burrows for burrowing owl, no burrowing owls were observed, nor was any sign of presence of burrowing owls observed. Due to the presence of potentially suitable habitat and local records within one mile of the site at the White Point Nature Preserve (Larson 2007), significant impacts could occur on burrowing owls and this issue will be addressed in the EIR/EIS at the project level.

The Angels Gate shaft site is located within the 0.20-mile buffers from known occurrences of two CNPS species, Lyon's pentachaeta (CNPS 1B.1) and island green dudleya (CNPS 1B.2). However, the probability of either of these species to occur in the low-mown grass and ruderal plant communities at this shaft site is low. Therefore, impacts on either species would be less than significant and will not be addressed in the EIR/EIS at the project level.

Due to the developed nature and lack of suitable habitat at the Angels Gate shaft site, there is a low potential for special-status biological resources to occur. Therefore, direct construction and operational impacts on special-status biological resources are not expected (excluding the burrowing owl, which is discussed above). Impacts on special-status biological resources would be less than significant and will not be addressed in the EIR/EIS at the project level.

Point Fermin Park occurs adjacent and south of the Angels Gate shaft site, across Paseo Del Mar. The park is completely landscaped with large trees (including fig [*Ficus carica*], pine [*Pinus sp.*], and eucalyptus [*Eucalyptus sp.*]). Beyond the area lies a series of cliffs and the open ocean. The cliffs support a known nesting location for American peregrine falcon (*Falco peregrinus*), which was also observed during the field visit. A total of two peregrine falcons were observed, one foraging and flying from a point just south of the shaft site to a steep rock faced cliff near the park (Point Fermin). From the northern extent of the cliffs and near where the falcons were observed, the shaft site is approximately 200 feet to the east at the closest point.

Overall, potential indirect construction impacts on special-status biological resources would be less than significant since the shaft site and adjacent land in Point Fermin Park is either paved or landscaped lawn that does not support significant biological resources. However, there is the potential for indirect impacts

on nesting birds, in particular to the state fully protected American peregrine falcon, and this issue will be addressed in the EIR/EIS at the project level.

No long-term operational indirect impacts on special-status biological resources from the Angels Gate shaft site would occur because the shaft would be converted into a belowground access structure that would be connected to the tunnel. Therefore, this issue will not be addressed in the EIR/EIS at the project level.

**Shaft Site – Royal Palms**. The proposed footprint for the Royal Palms shaft site is dominated by non-native grasses and ruderal species, particularly cheeseweed. The site also contains sporadic ice plant. No riparian or sensitive natural communities exist at the Royal Palms shaft site or surrounding it. Therefore, no short-term or long-term direct or indirect impacts on riparian habitat or sensitive natural communities at the Royal Palms shaft site would occur, and this issue will not be addressed in the EIR/EIS at the project level. No special-status species occur on the site due to the lack of suitable habitat; therefore, no direct impacts on biological resources have been identified and this issue will not be addressed in the EIR/EIS at the project level.

The surrounding area includes a rocky beach to the south and east. The area to the north contains a steep slope, which is mostly bare, but does contain sporadic plants (predominantly non-native grasses and ice plant). Some landscape species also occur on this slope, including Indian fig cactus (*Opuntia ficus-indica*), blackwood acacia, Mexican fan palm, and Canary Island date palm. There is coastal scrub habitat found along the bluff east of the Royal Palms shaft site. One federally listed threatened species, the coastal California gnatcatcher, may inhabit this type of habitat. Therefore short-term and long-term indirect impacts on this species will be addressed in the EIR/EIS at the project level. A small area to the west of the site and most of the area east of the site contains mostly non-native grasses and other ruderal species, as well as occasional California brittlebush (*Encelia californica*). Numerous fan palms and Canary Islands date palms occur west of the site; these trees are cleanly trimmed. The range of a CNPS 1B.2 species, island green dudleya, is also found within 0.25 mile of the site and could be present in the coastal bluff scrub habitat adjacent to the project site to the east. However, this plant would not be expected in the ruderal and developed area of the shaft site footprint. The rest of the surrounding area is developed with residences and a parking lot. Therefore, no short-term or long-term impacts on special-status plants would occur, and this issue will not be addressed in the EIR/EIS at the project level. A drainage pipe terminates on the top of the slope just southeast of the site. The water flows a short distance to the parking lot, then into the rock and the ocean. This drainage feature is located outside of the project footprint and would not be affected by construction at the shaft site.

The range of the federally and state-listed endangered Palos Verdes blue butterfly is within 0.25 mile of the Royal Palms shaft site. However, the species is currently only known to occupy two sites that are located on U.S. Naval property on the Palos Verdes peninsula (USFWS 2008). In addition, the shaft site and surrounding area has developed and ruderal habitat and is not likely to support host plants for this species; therefore, short-term and long-term direct and indirect impacts would not occur and will not be addressed in the EIR/EIS at the project level.

No potential long-term indirect impacts on special-status biological resources from the Royal Palms shaft site would occur because once operational, the shaft would be converted into a belowground access structure that would be connected to the tunnel. Therefore, this issue will not be addressed in the EIR/EIS at the project level.

**BIO-2. Overall Determination: Potentially Significant Impact.** Construction at the Royal Palms shaft site could significantly impact federally listed threated species. Therefore, construction impacts related to this specific project element will be addressed in the EIR/EIS at the project level. Operational impacts at all project elements would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**All Shaft Sites.** As discussed in BIO-1 (Project), the only federally listed species that could occur adjacent to a shaft site is the coastal California gnatcatcher at the Royal Palms shaft site. Construction impacts could be potentially significant to this species and will be addressed in the EIR/EIS at the project level. As discussed in BIO-1 (Project), no other shaft site has a federally listed species that could occur on site or adjacent to the site. Therefore, construction and operational impacts would not occur at the other shaft sites and will not be addressed in the EIR/EIS at the project level.

**BIO-3. Overall Determination: Less Than Significant Impact.** No impacts would occur on state-listed species. Therefore, this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**All Shaft Sites.** As discussed in BIO-1 (Project), no impacts on the Palos Verdes blue butterfly, a federally and state-listed endangered species, would occur at the JWPCP East, JWPCP West, or Royal Palms shaft sites. No other state-listed threatened or endangered species have been identified as potentially occurring at the shaft sites. Therefore, construction and operational impacts would not occur, and this issue will not be addressed in the EIR/EIS at the project level.

**BIO-4. Overall Determination: Less Than Significant Impact.** The shaft sites are not located in areas designated critical habitat. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**All Shaft Sites.** See analysis under BIO-1 (Project). All of the shaft sites are primarily developed with minimal sparse ruderal or non-native vegetation. None of the shaft sites or adjacent lands are designated critical habitat for any threatened or endangered species (USFWS 2011b). Therefore, impacts would not occur during construction and operation, and this issue will not be addressed in the EIR/EIS at the project level.

**BIO-5. Overall Determination: Potentially Significant Impact.** Construction at the Angels Gate shaft site could significantly impact state species of special concern. Therefore, construction impacts related to the Angels Gate shaft site will be addressed in the EIR/EIS at the project level. Operational impacts on all project elements would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**All Shaft Sites.** See analysis under BIO-1 (Project). The Angels Gate shaft site is the only shaft site with the potential to impact the burrowing owl (state species of concern) during construction. Therefore, these species will be addressed in the EIR/EIS at the project level. No other shaft sites have state species of special concern; therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**BIO-6. Overall Determination: Less Than Significant Impact.** Construction and operational impacts on sensitive plant species would be less than significant. Therefore, this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**All Shaft Sites.** See analysis under BIO-1 (Project). Construction and operational impacts on coast woolly-heads at the LAXT shaft site; south coast saltscale, Davidson's saltscale, or estuary seablite at the Southwest Marine shaft site; Lyon's pentachaeta at the Angels Gate shaft site; or island green dudleya at the Angels Gate or Royal Palms shaft sites would not occur. Therefore, this issue will not be addressed in the EIR/EIS at the project level.

**BIO-7. Overall Determination: Less Than Significant Impact.** The shaft sites are not located within or near an HCP or NCCP and no impacts could occur. Therefore, this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfall | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**All Shaft Sites.** See analysis in BIO-7 (Program). There are limited HCPs/NCCPs in the Los Angeles region and the shaft sites are not located in any of the HCPs/NCCPs. Impacts would not occur and this issue will not be addressed in the EIR/EIS at the project level.

**BIO-8. Overall Determination: No Impact.** Construction and operation at the shaft sites would not impact wetlands, waters of the U.S., or aquatic habitat. Therefore, this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**Shaft Sites – JWPCP East, JWPCP West, TraPac, LAXT, Southwest Marine, and Angels Gate.** See analysis in BIO-1 (Project). There are no wetlands or waters of the U.S. that currently exist on the JWPCP East, JWPCP West, TraPac, Southwest Marine, LAXT, or Angels Gate shaft sites. Furthermore, construction and operation at the shaft sites do not have the potential to impact aquatic habitat because all construction would be contained within shaft site boundaries.

**Shaft Site – Royal Palms.** There is one drainage feature potentially under the jurisdiction of the U.S. Army Corps of Engineers (Corps) and the CDFG at the eastern boundary of the Royal Palms shaft site. However, this feature is outside the project footprint and would be unaffected by construction at the shaft site. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**BIO-9. Overall Determination: Less Than Significant Impact.** Construction and operational impacts on the movement of freshwater non-native fish species and terrestrial wildlife species would be less than significant. Therefore, this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**Shaft Sites – JWPCP East, JWPCP West, TraPac, LAXT, and Southwest Marine.** Construction at these sites would be contained within each shaft site and would have no effect on surface waters. Therefore, there would be no impact on the movement of fish or other aquatic life. Likewise, these sites do not provide wildlife migration corridors, and shaft construction would have no impact on movement of terrestrial wildlife species. Therefore, construction and operation impacts would not occur and this issue will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – Royal Palms and Angels Gate.** The Royal Palms and Angels Gate shaft site locations are adjacent to shoreline that is within the Los Angeles County General Plan land use designation of SEA. While areas adjacent to the shoreline can function as important wildlife corridors or provide habitat linkage, these sites are previously developed sites. As a result, the potential for construction at these two shaft sites to directly or indirectly interfere with the movement of terrestrial wildlife species through impacts on or reduction in quality of a documented wildlife corridor or habitat linkage would be less than significant. Therefore, this issue will not be addressed in the EIR/EIS at the project level.

**BIO-10. Overall Determination: Potentially Significant Impact.** Impacts on noise and disturbance as a result of construction at the JWPCP East, JWPCP West, LAXT, Angels Gate, and Royal Palms shaft sites could conflict with the California Fish and Game Code and the federal Migratory Bird Treaty Act. Therefore, construction impacts related to these specific project elements would be potentially significant and this threshold will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Biological Resources (Terrestrial) evaluates biological impacts resulting from land-based activities or occurring on land-based biological resources. The construction and operation on the riser and diffuser area and rehabilitation of the existing ocean outfalls would be performed in the ocean. Impacts on marine biological resources associated with these project elements are discussed in Section XI (Marine Environment).

**Shaft Sites – JWPCP East, JWPCP West, LAXT, Angels Gate, and Royal Palms.** Birds nesting in ornamental landscaping and ruderal vegetation on and around these shaft sites could be affected by construction noise, light, dust, and activity. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Once the shaft sites are operational, they would not disturb nesting birds because they would be self-contained and primarily located underground. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Cultural Resources Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **V.** | **CULTURAL RESOURCES (TERRESTRIAL AND MARINE).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| CUL-1. | Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5 or result in an adverse effect on a historic property pursuant to 36 CFR Section 800.5? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| CUL-2. | Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5 or result in an adverse effect on a historic property that is an archaeological site pursuant to 36 CFR Section 800.5? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| CUL-3. | Result in disturbance or destruction of a unique paleontological resource or site or unique geologic feature? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| CUL-4. | Result in disturbance of any human remains, including those interred outside of formal cemeteries? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| CUL-5. | Result in direct or indirect damage or removal of a significant submerged marine cultural resource or result in alteration or cause change to stable environmental conditions for a significant submerged cultural resource(s)? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Cultural Resources Program Discussion

**CUL-1. Overall Determination: Potentially Significant Impact.** Construction of several program elements could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5. Therefore, construction impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Approximately 33 miles of the conveyance system would be improved within the JOS. The conveyance system is located within existing public rights-of-way of streets in the JOS service area; therefore, construction would occur within these rights-of-way. Construction would be temporary in duration. However, because the location of the construction on the conveyance system is unknown as is whether existing historical resource are located within the vicinity of construction, impacts would be potentially significant and will be addressed in the EIR/EIS at the program level. Subsequent site-specific CEQA documents may be needed for the conveyance system improvements once the location of the improvements is known. During operation, the conveyance system would be underground and would convey, via gravity, wastewater from points of origin (e.g., businesses and homes) to the WRPs. Therefore, operational impacts on historic resources would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Historical structures or potentially historical structures need to be present, or near to, program facilities in order for a potential impact to occur. Plant expansion and process optimization at the SJCWRP, and process optimization at the POWRP, LCWRP, and LBWRP may have the potential to impact historical resources. It is currently unknown whether designated historical resources or potentially historical resources exist within proximity to these WRPs. Therefore, construction activities at the WRPs have the potential to impact unknown historical resources in the area. Process optimization at each of the WRPs would operate underground and would not have the ability to impact historical structures. The expansion of SJCWRP would be located within the existing footprint of the WRP and would be compatible with it during operation. Therefore, operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

WRP effluent management at each of the WRPs includes the continued discharge of tertiary treated effluent into existing water bodies and the continued beneficial reuse of the treated effluent (e.g., using recycled water for landscaping). The actual discharge or beneficial reuse of treated effluent does not have the potential to impact historical resources because there is no physical action that could change or alter a historical resource. Therefore, operation of the WRP effluent management element would not result in impacts and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** An increase of solids processing and biosolids management would take place within the existing JWPCP. There are some structures that are over 50 years of age at the JWPCP, but they have been altered substantially over time to maintain their function and purpose at the JWPCP. Construction of solids processing facilities would take place within the JWPCP and, therefore, it would potentially alter some of the existing JWPCP structures. Thus, construction impacts would be potentially significant and

will be addressed in the EIR/EIS at the program level. Once the solids processing digesters are operational, they would be self-contained and would not have the ability to affect historic structures; therefore, impacts would not occur and will not be addressed in the EIR/EIS at the program level. Any increase in biosolids production at the JWPCP would not have the potential to affect historical resources because no construction would take place under biosolids production and the operation would simply involve an increase in truck trips, which has no ability to affect historical resources. The biosolids would be beneficially applied in various locations throughout the state of California. This would not adversely affect existing historical resources because the land application would simply require application on existing agricultural land, and the use would occur within an established building or area that uses biosolids. Therefore, the operation of biosolids management would not result in impacts on historical resources and will not be addressed in the EIR/EIS at the program level.

**CUL-2. Overall Determination: Potentially Significant Impact.** Construction of several program elements could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. Therefore, construction impacts related to these specific program elements would be potentially significant, and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See CUL-1 (Program) for details. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Known and unknown archeological resources are typically found and altered during ground-disturbing construction activities that occur within 15 to 20 feet of ground surface. Ground-disturbing activities would occur at the POWRP, LCWRP, and LBWRP during process optimization and at the SJCWRP during process optimization and plant expansion. Therefore, construction activities at the WRPs may result in an impact on unknown archeological resources and will be addressed in the EIR/EIS at the program level. Operations would not involve ground disturbance and would consist of in place structures; therefore, operations would not affect archeological resources. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Construction would not occur under WRP effluent management. The continued discharge of treated effluent from the WRPs into existing receiving waters and continued beneficial reuse would not affect archeological resources because these activities do not involve ground disturbance, and the act of discharging water would not affect archaeological resources. Therefore, operation of WRP effluent management would not result in a significant impact on archaeological resources and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The construction of six anaerobic digesters at the JWPCP would result in ground disturbance. The digesters are usually placed two to three stories bgs and excavation would be required. Therefore, construction activities at the JWPCP may result in an impact on unknown archeological resources and will be addressed in the EIR/EIS at the program level. Operations would not involve ground disturbance

and thus would not affect archeological resources. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Any increase in biosolids production at the JWPCP would not involve ground disturbance and thus, would not have the potential to impact archeological resources. The biosolids would be beneficially applied in various locations throughout the state of California. The actual land use application or beneficial use would occur on existing agricultural land or in existing reuse buildings or areas. The actual application or beneficial use of biosolids would not adversely affect known or unknown archeological resource because ground disturbance would not occur and this issue will not be addressed in the EIR/EIS at the program level.

**CUL-3. Overall Determination: Potentially Significant Impact**. Plant expansion and process optimization at SJCWRP; process optimization at the POWRP, LCWRP, and LBWRP; and construction of solids processing digesters at JWPCP could result in disturbance or destruction of a unique paleontological resource or site or unique geologic feature. Therefore, construction impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

See CUL-2 (Program) regarding construction and operational impacts on archeological resources, which would also apply to paleontological resources. Construction impacts identified in CUL-2 (Program) would be potentially significant for paleontological resources and will be addressed in the EIR/EIS at the program level. Operations would not involve ground disturbance and, thus, would not affect paleontological resources. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**CUL-4. Overall Determination: Potentially Significant Impact.** Construction of all program elements could result in the disturbance of human remains. Therefore, construction impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See CUL-1 (Program) for details. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Human remains generally are only found and disturbed during ground-disturbing activities of construction. There are no formal cemeteries located near any of the WRPs, except the POWRP (ESRI 2009a). Spada Cemetery is located approximately 0.5 mile west of the POWRP. It is highly unlikely

there would be any human remains interred outside formal cemeteries and located on site at any of the WRPs. The WRPs are located on developed industrial lands, which have been regularly disturbed over time during facility construction, upgrades, and modifications. Previous land disturbance at these facilities would have uncovered any unknown human remains interred outside formal cemeteries. Furthermore, WRP effluent management would not involve ground-disturbing activities and, therefore, would have no potential to disturb unknown human remains interred outside cemeteries. However, it is unknown if Native American remains may be interred somewhere within the general vicinity of the construction of the WRP program elements. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once plant expansion and process optimization at SJCWRP and process optimization at POWRP, LCWRP, and LBWRP are operational, human remains would not be disturbed. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP is also located on developed industrial land, which has been regularly disturbed over time during facility construction, upgrades, and modifications. Previous land disturbance at these facilities would have uncovered any unknown human remains interred outside formal cemeteries. However, it is unknown if Native American remains may be interred somewhere within the general vicinity of the construction of the solids processing facilities. Therefore, construction impacts associated with solids processing would be potentially significant and will be addressed in the EIR/EIS at the program level. Once the solids processing digesters are operational, human remains would not be disturbed. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Operation of biosolids management would not involve ground-disturbing activities and, therefore, would have no potential to disturb unknown human remains, including Native American remains, interred outside cemeteries.

**CUL-5. Overall Determination: Not Applicable.** There would be no construction or operation in the marine environment for the program elements. Therefore, construction and operation of the program elements would not result in direct or indirect damage or removal of a significant submerged marine cultural resource or result in alteration or cause change to stable environmental conditions for a significant submerged cultural resource(s). Construction and operational impacts are not applicable, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | N/A | N/A |
| SJCWRP – Plant Expansion | N/A | N/A |
| WRP – Process Optimization | N/A | N/A |
| WRP – Effluent Management | N/A | N/A |
| JWPCP – Solids Processing | N/A | N/A |
| JWPCP – Biosolids Management | N/A | N/A |

## Cultural Resources Project Discussion

**CUL-1. Overall Determination: Potentially Significant Impact.** Construction of several project elements could substantially adversely impact historical resources. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See CUL-5. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See CUL-5. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnels would be constructed at depths between 70 and 450 feet bgs or below the seafloor. At these depths, historical resources are not likely present. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** All of the shaft sites, with the exception of Angels Gate and Royal Palms, are located primarily on disturbed vacant or industrial land. However, there could be unknown historical resources located at or within the vicinity of the JWPCP East, JWPCP West, TraPac, LAXT, or Southwest Marine shaft sites. The Angels Gate and Royal Palms shaft sites have the potential for historical resources to be located on site or nearby. Therefore, construction at any shaft site has the potential to cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

Under operating conditions, all shaft sites would consist of a belowground access structure and potentially ancillary aboveground facilities with low profiles. Therefore, operational impacts on a historical resource would not occur and will not be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – San Pedro Shelf and Palos Verdes Shelf.** See CUL-5 (Project) for a discussion of impacts on cultural resources in the marine environment.

**Riser/Diffuser Area – Existing Ocean Outfalls.** The existing ocean outfalls are more than 50 years of age; therefore, they could be a significant historical architectural resource and will be addressed in the EIR/EIS at the project level. See CUL-5 (Project) for a discussion of impacts on cultural resources in the marine environment.

**CUL-2. Overall Determination: Potentially Significant Impact.** Construction of several project elements could disturb or destroy archaeological resources. Therefore, construction impacts related to these specific project elements would be potentially significant for these specific project elements and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See CUL-5. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See CUL-5. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See CUL-5. | |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnels would be constructed at depths between 70 and 450 feet bgs or below the seafloor. Typically, prehistoric and historic archaeological resources are found buried within 10 to 15 feet bgs. Although, on rare occasions, archaeological resources have been found at greater depths (20 to 30 feet). These resources are found at shallow depths because it typically takes many years for sediment to accumulate and cover resources that have been left behind. Therefore, construction and operational impacts associated with the onshore and offshore tunnels have a low potential to affect prehistoric and historic archaeological resources and, therefore, would be less than significant and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Known and unknown archeological resources are typically found and altered during ground-disturbing construction activities conducted at depths of 10 to 15 feet as discussed under the tunnel alignments. The project elements include the construction of large shafts in multiple locations at depths greater than 15 feet bgs. Therefore, construction of the project elements could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5 at ground disturbing activities conducted at shallower depths. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

See CUL-1 (Project) for operational impacts. Operational impacts would not occur on archeological resources and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** See CUL-5 (Project) for a discussion of impacts on cultural resources in the marine environment.

**CUL-3. Overall Determination: Potentially Significant Impact.** Construction of several project elements could disturb or destroy unique paleontological resources. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See CUL-5. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See CUL-5. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See CUL-5. | |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnels would be constructed at depths between 30 and 450 feet bgs or below the seafloor and would extend through geologic materials that could contain paleontological resources. Therefore, construction impacts of the onshore and offshore tunnels would be potentially significant for paleontological resources and will be addressed in the EIR/EIS at the project level.

Once operational, the onshore and offshore tunnels would simply convey secondary treated effluent to the ocean. The tunnels would remain in the subsurface and would be self-contained. Operations would not result in the disturbance or destruction of a unique paleontological resource or site. Therefore, operation of the onshore tunnels would have no impact and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Known and unknown unique paleontological resources are typically found and altered during ground-disturbing construction activities, similar to archeological resources. However, these resources can be located much deeper than 15 feet bgs because of how the geologic processes that preserve paleontological resources throughout millions of years occur. Sediment and other geology is deposited in an area and modified through either sedimentation or deposition. This modification can result in the burying of geology and the preservation of fossils deep below the ground surface. Therefore, the discussion of impacts on archeological resources in CUL-2 (Project) would also apply to paleontological resources. The construction at any shaft site could result in disturbance or destruction of a unique paleontological resource or site or unique geologic feature. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

See CUL-2 (Project) for a discussion of operational impacts on archeological resources as they would be similar to paleontological resources. Operation at any shaft site would not result in impacts on paleontological resources and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** See CUL-5 (Project) for a discussion of impacts on cultural resources in the marine environment.

**CUL-4. Overall Determination: Potentially Significant Impact.** Construction of all shaft sites could result in disturbance of human remains, including those interred outside of formal cemeteries. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See CUL-5. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See CUL-5. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See CUL-5. | |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnels would be constructed at depths between 70 and 450 feet bgs or below the seafloor. Human remains would not be located at those depths. Therefore, construction and operational impacts of the onshore and offshore tunnels would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Construction at any shaft site has the potential to result in disturbance of human remains, including those interred outside of formal cemeteries, if present at the shaft site locations. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. See

CUL-1 (Project) for operational impacts. Operational impacts would not occur to unknown human remains and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** See CUL-5 (Project) for a discussion of impacts on cultural resources in the marine environment.

**CUL-5. Overall Determination: Potentially Significant Impact.** Construction at all the riser and diffuser areas could directly or indirectly damage or remove a submerged marine cultural resource or alter or cause change to stable environmental conditions of a significant submerged marine cultural resource. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**Tunnel Alignments – Onshore and Offshore.** Construction and operation of the onshore tunnel and offshore tunnels would not occur within the marine environment. Therefore, this threshold is not applicable and will not be addressed in the EIR/EIS at the project level for these project elements.

**All Shaft Sites.** Construction and operation at the shaft sites would not occur within the marine environment. Therefore, this threshold is not applicable and will not be addressed in the EIR/EIS at the project level for these project elements.

**Riser/Diffuser Area – San Pedro Shelf and Palos Verdes Shelf.** The new riser and diffuser would be located on the PV Shelf or SP Shelf in the Pacific Ocean. Since it is currently unknown whether there are submerged prehistoric or historical cultural resources located on the PV Shelf or SP Shelf riser and diffuser areas, the construction of the riser and diffuser could have a significant impact on submerged marine resources. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the riser and diffuser would discharge treated effluent through the diffuser into the Pacific Ocean. The operation may have the potential to indirectly damage any unknown significant submerged marine cultural resources. Therefore, operational impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – Existing Ocean Outfalls.** There is a potential for submerged cultural resources to be located within proximity to the existing ocean outfalls. This is because plotted obstructions/shipwrecks are located within the vicinity of the existing ocean outfalls, the existing ocean outfalls are near shore, and the existing ocean outfalls are within proximity to land forms and areas of high marine activity (Point Fermin, the Ports of Los Angeles and Long Beach). Therefore, construction and operation at the existing ocean outfalls has the potential to impact submerged cultural resource and will be addressed in the EIR/EIS at the project level.

## Geology and Soils/Mineral Resources Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **VI.** | **GEOLOGY AND SOILS/MINERAL RESOURCES.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| GEO-1. | Expose people, structures, or property to major geologic hazards such as landslides, mudslides, or ground failure? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| GEO-2. | Expose people or structures to a substantially adverse effect, including the risk of loss, injury, or death involving rupture of a known earthquake fault? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| GOE-3. | Expose people or structures to a potential substantially adverse effect, including the risk of loss, injury, or death involving strong seismic ground shaking? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| GEO-4. | Expose people or structures to a potential substantially adverse effect including the risk of loss, injury, or death involving substrate consisting of material that is subject to liquefaction or other secondary seismic hazards in the event of ground shaking? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **VI.** | **GEOLOGY AND SOILS/MINERAL RESOURCES.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| GEO-5. | Substantially accelerate natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition, which would not be contained or controlled on site? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| GEO-6. | Result in unstable earth conditions or changes in geologic substructure? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| GEO-7. | Be located in soil characterized by shrink-swell potential that might result in deformation of foundations or damage to structures? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| GEO-8. | Destroy, permanently cover, or materially and adversely modify one or more distinct and prominent geologic or topographic features. Such features may include, but are not limited to, hilltops, ridges, hillslopes, canyons, ravines, rock outcrops, water bodies, streambeds, and wetlands? | ☐ | ☐ | ☒ | ☒ | ☐ | ☐ |
| GEO-9. | Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **VI.** | **GEOLOGY AND SOILS/MINERAL RESOURCES.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| GEO-10. | Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |

## Geology and Soils/Mineral Resources Program Discussion

**GEO-1. Overall Determination: Potentially Significant Impact.** Impacts associated with landslides, mudslides, and ground failure during construction and operation of POWRP process optimization would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Landslides and mudslides typically occur in areas with unstable slopes. Although it is unknown exactly where the conveyance system would be improved, the conveyance system is generally located within existing public rights-of-way of streets in the JOS service area. Therefore, construction would occur within these rights-of-way. Trenching and digging would be required to improve the conveyance system. Public streets are generally flat with little to no relief that could cause landslides or mudslides during construction. Furthermore, roads and the public rights-of-way are typically graded and built with materials to specifically prevent ground failure in order to maintain the road. Finally, all construction for improvements to the conveyance system would be built according to engineering standards and the California Building Code, and consequently, the potential for ground failure would not increase. Therefore, construction of the conveyance system would not experience or result in landslides, mudslides, or ground failure. Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Under operation, the conveyance system would be underground and would convey, via gravity, wastewater from points of origin (i.e., businesses and homes) to the WRPs. Therefore, landslides, mudslides, or ground failure would not occur during the operation of the conveyance improvements and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Landslides and mudslides typically occur in areas with unstable slopes. The SJCWRP, LCWRP, and LBWRP are located in areas that are not susceptible to landslides, mudslides, or ground failure (California Department of Conservation 1999a, 1999b, 1999c ). The construction activities associated with process optimization tanks and plant expansion would not increase the potential risk from ground failure. Furthermore, construction of the plant expansion at the SJCWRP and the underground tanks for process optimization at the SJCWRP, LCWRP, and LBWRP would be built according to engineering standards and the California Building Code; consequently, the potential for ground failure would not increase. There would be no additional employees at these WRPs, and the operation of the plant expansion and process optimization would not include additional habitable buildings. Therefore, the construction and operation at the SJCWRP, LCWRP, and LBWRP would not result in or increase exposure to landslides, mudslides, and ground failure. Construction and operational impacts would not occur at the SJCWRP, LCWRP, and LBWRP and will not be addressed in the EIR/EIS at the program level.

The POWRP is located in a landslide zone and could be susceptible to landslides and mudslides because Elephant Hill is located to the south/southwest of the WRP (California Department of Conservation 1999d). During construction of the process optimization facilities at the POWRP, construction workers could be exposed to landslides or mudslides in this area. Once operational, there would be no additional

employees at the POWRP and the operation of process optimization would not include additional habitable buildings. Also, the location of the POWRP facility was selected to reduce ground failure potential, and what is being proposed does not increase the potential risk from ground failure. Any underground tanks for process optimization would be built according to engineering standards and the California Building Code; consequently, the potential for ground failure would not increase. However, because the POWRP is located in an area identified as having the potential for landslides, construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

WRP effluent management at each of the WRPs includes the continued discharge of tertiary treated effluent into existing receiving waters and the continued beneficial reuse of the treated effluent (e.g., using recycled water for landscaping). The discharge would occur at existing discharge points along receiving waters. The actual discharge or beneficial reuse of treated effluent does not have the potential to cause or be exposed to landslides, mudslides, or ground failure. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP is located on flat, fully-developed land with no relief to support either a landslide or a mudslide. Construction activities associated with the solids processing digesters would not increase the potential risk from ground failure. Furthermore, construction of the solids processing digesters would be built according to engineering standards and the California Building Code; consequently, the potential for ground failure would not increase. The number of employees would not increase at the JWPCP, and construction and operation of the solids processing digesters would not include additional habitable buildings. Therefore, construction and operation at the JWPCP would not result in or increase exposure to landslides, mudslides, or ground failure. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Biosolids management would not result in construction; therefore, it does not have the potential to cause or increase exposure to landslides, mudslides, or ground failure. The increase in biosolids at the JWPCP would require an increased number of trucks to transport the biosolids to beneficial use locations throughout the state of California. Land application of biosolids would simply require application on existing agricultural land and beneficial use would occur within an established building or area that uses biosolids. Therefore, the operation of biosolids management would not result in or increase exposure to landslides, mudslides, or ground failure. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**GEO-2. Overall Determination: Potentially Significant Impact.** Although none of the program elements are located in an Alquist-Priolo fault zone characterized by surface rupture that might be related to a fault, several program elements would likely be susceptible to seismic activity. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | X |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | X |
| JWPCP – Biosolids Management | N/A | X |

**Conveyance System.** Although it is unknown exactly where the conveyance system would be improved, the conveyance system is generally located within existing public rights-of-way of streets in the JOS service area. Therefore, construction would occur within these rights-of-way. While it is unlikely the

conveyance system would cross a designated Alquist-Priolo fault (see the WRPs determination discussion for more on Alquist-Priolo), Southern California is a seismically active area. Therefore, construction and operation of the conveyance improvements would be potentially significant and will be addressed in the EIR/EIS at the program level.

**WRPs.** Surface rupture is generally limited to land immediately adjacent to an active fault. The Alquist-Priolo Special Studies Zone Act (1978) requires that special geologic studies be conducted to locate and assess the activity level of any fault within a potential development site. The Alquist-Priolo faults are identified by the state of California. None of the WRPs are located within immediate proximity to an Alquist-Priolo fault (California Department of Conservation 1986a, 1991, 2012); therefore, they would not be impacted by an Alquist-Priolo fault or a surface fault rupture.

However, the program elements are located in southern California, which is an area known for active fault lines and numerous earthquakes. The WRPs are located within the general vicinity of many faults including the Workman, Los Alamitos, San Jose, Whittier, Raymond Hill, Newport-Inglewood, Cabrillo, and Palos Verdes Faults. Faults such as these are typical of southern California, and it is reasonable to expect a strong seismic event within the life of the program. Furthermore, the 1997 Uniform Building Code locates the entire Los Angeles area within Seismic Risk Zone 4. Areas within Zone 4 are expected to experience maximum magnitudes and damage in the event of an earthquake. For additional information regarding the program's exposure to seismic activity see GEO-3 (Program). The construction and operation of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP could be susceptible to seismic activity. Therefore, construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

WRP effluent management at each of the WRPs includes the continued discharge of tertiary treated effluent into existing receiving waters and the continued beneficial reuse of the treated effluent (e.g., using recycled water for landscaping). The discharge would occur at existing discharge points along receiving waters. Because the WRPs are not located along or across an Alquist-Priolo fault, the actual discharge or beneficial reuse of treated effluent would not be impacted by an area characterized by surface rupture. Therefore, operational impacts associated with WRP effluent management would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP is not located within immediate proximity to an Alquist-Priolo fault (California Department of Conservation 1986b); therefore, it would not be impacted by an Alquist-Priolo fault or a surface fault rupture. For additional information regarding the JWPCP's exposure to seismic activity see GEO-3 (Program). The construction and operation of the solids processing digesters and the operation of biosolids management could be susceptible to seismic activity. Therefore, construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

**GEO-3. Overall Determination: Potentially Significant Impact**. All of the program elements (except WRP effluent management) could expose people or structures to strong seismic ground shaking. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | X |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | X |
| JWPCP – Biosolids Management | N/A | X |

**Conveyance System.** The conveyance system would be built in compliance with the most up-to-date building codes required by the state of California and the California Building Code, which would minimize potential impacts to the greatest degree feasible. However, because the conveyance system is located in southern California, which is a seismically active area, construction and operation of the conveyance improvements would result in potentially significant impacts and will be addressed in the EIR/EIS at the program level.

**WRPs.** It is reasonable to expect a strong seismic event within the life of the plant expansion at the SJCWRP and the process optimization facilities at the SJCWRP, POWRP, LCWRP, and LBWRP because they are located in southern California, an area known for frequent seismic activity. None of the structures constructed or operated would be habitable and process optimization or plant expansion would not result in a substantial increase of employees at any of the WRPs. Plant expansion and process optimization facilities would be built in compliance with the most up-to-date building codes required by the state of California and the California Building Code, which would minimize potential impacts to the greatest degree feasible. Nevertheless, the WRPs are located in southern California, which is a seismically active area. Therefore, construction and operation of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP could expose people or structures to a potential substantially adverse effect, including the risk of loss, injury, or death involving strong seismic ground shaking. Construction and operational impacts would be potentially significant, and this issue will be addressed in the EIR/EIS at the program level.

The operation of WRP effluent management would include a change in the volume of treated effluent discharged from the WRPs. The volume of treated effluent would continue to be discharged from the same discharge points and locations along the receiving waters. WRP effluent management is not susceptible to groundshaking and, therefore, will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See the conveyance system and WRPs discussion for details. Construction and operation of the solids processing digesters and operations of the biosolids management could expose people or structures to a significant adverse effect involving strong seismic ground shaking. Construction and operational impacts would be potentially significant, and this issue will be addressed in the EIR/EIS at the program level.

**GEO-4. Overall Determination: Potentially Significant Impact.** Several program elements would likely be susceptible to substantially adverse effects involving substrate subject to liquefaction. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | X |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Liquefaction in soils and sediments occurs when granular material is subjected to large, rapidly applied loads (e.g., earthquake shaking), causing the soil to behave like a liquid. Earthquake-induced liquefaction most often occurs in areas underlain by unconsolidated, saturated sediments. Much of southern California covers a large expanse of unconsolidated alluvial sediment. Therefore, construction and operation of the conveyance improvements could expose structures to significant adverse effects involving substrate that is subject to liquefaction. Construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

**WRPs.** The soils at the SJCWRP are a combination of alluvial sediments and thin clay, and the onsite materials are stiff and dense (Fugro 2011). This soil has a low potential for liquefaction; therefore, construction and operation of plant expansion and process optimization at the SJCWRP would not expose people or structures to a potential substantially adverse effect from liquefaction. Construction and operational impacts at the SJCWRP would be less than significant and will not be addressed in the EIR/EIS at the program level.

The POWRP, LCWRP, and LBWRP may have soils with liquefaction potential, and construction and operation of process optimization at these sites could expose people or structures to a significant adverse effect, including the risk of loss, injury, or death involving substrate consisting of material that is subject to liquefaction or other secondary seismic hazards in the event of ground shaking. Therefore, construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

WRP effluent management at each of the WRPs includes the continued discharge of tertiary treated effluent into existing receiving waters and the continued beneficial reuse of the treated effluent (e.g., using recycled water for landscaping). The discharge would occur at fully lined, existing discharge points along receiving waters (i.e., San Gabriel River), with the exception of the POWRP, WNWRP, and SJCWRP, which would discharge some effluent into unlined channels. The discharge of treated effluent would not be subject to liquefaction or other secondary seismic hazards. Impacts associated with WRP effluent management would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The soils at the JWPCP are a combination of alluvial sediments and thin clay, and the onsite materials are stiff and dense (Fugro 2011). This soil has a low potential for liquefaction; therefore, construction of solids processing facilities and operation of solids processing facilities and biosolids management at the JWPCP would not expose people or structures to a potential significant adverse effect from liquefaction. Construction and operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**GEO-5. Overall Determination: Potentially Significant Impact.** Construction of several program elements could result in substantial wind or water erosion. Therefore, construction impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Areas particularly vulnerable to wind and water erosion generally have large amounts of exposed soils, highly erodible soils, and steep slopes. Generally, land in the JOS service area that is serviced by the conveyance system is highly developed and is not susceptible to erosion. However, construction of the conveyance system would involve trenching, cut, and fill. During construction, earth-moving operation could increase short-term erosion. The storage and movement of soil greatly affects the amount of erosion that occurs. If soil is improperly stored or transported, wind and water can erode soil. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

Under operating conditions, the conveyance system piping would be buried in the public rights-of-way of streets. Therefore, the operation of the conveyance improvements would not substantially accelerate the processes of wind or water erosion and sedimentation. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Areas particularly vulnerable to wind and water erosion generally have large amounts of exposed soils, highly erodible soils, and steep slopes. Generally, land in the JOS service area and around the WRPs is highly developed and is not susceptible to erosion. Areas that are the most susceptible to erosion include steep unvegetated slopes with erodible soils. At the LCWRP, soils are sandy loam, silty loam, clay, and clay loam within the first 60 inches. These soils generally have a low erosion potential. The SJCWRP is located in sandy loam, which has a low erosion potential within the first 60 inches. The erodibility potential of soils at the POWRP and LBWRP is currently unknown. During construction, earth-moving operation could increase short-term erosion at the sites. The storage and movement of soil greatly affects the amount of erosion that occurs. If soil is improperly stored or transported, wind and water can erode soil. Therefore, construction impacts would be potentially significant for plant expansion at the SJCWRP and for process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP and will be addressed in the EIR/EIS at the program level.

Once the expansion of the SJCWRP has concluded and process optimization facilities are operating, there would be no potential for wind and water erosion. The process optimization tanks would be located below ground surface, and the surface would be returned to existing conditions at each WRP (see BIO-1 (Program) for a general description of existing conditions). The SJCWRP expansion would be contained within concrete structures that would not cause wind or water erosion.

Currently, discharges of treated effluent from the SJCWRP, POWRP, and WNWRP occur from existing discharge points to unlined portions of various receiving waters (San Jose Creek, the San Gabriel River, and the Rio Hondo). These discharges do not cause erosion problems within the receiving waters. WRP effluent management would result in some changes to the discharge volume at various existing discharge points into unlined receiving waters from the SJCWRP, POWRP, and WNWRP. Although there would be a change in volume over time, the change would not occur rapidly enough or in great enough volumes in the unlined portions of receiving waters to create erosion. The change would not occur rapidly because it is based on scheduled procedures within each of the WRPs that are implemented during the operation of the WRPs and at peak and low flow periods through the WRP treatment processes. Changes in discharge volumes from the LCWRP and LBWRP would not result in erosion impacts because the receiving waters from these WRPs are concrete-lined. Therefore, impacts associated with WRP effluent management would be less than significant and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The geological setting at the JWPCP consists of a wide variety of soils including sandy loam, gravelly loam, clay, clay loam, and sand (located very deep). These soils have a low to high erodibility potential. Construction of the solids processing digesters would involve cut and fill. During construction of new facilities, earth-moving operations could increase short-term erosion at the sites. The storage and movement of soil greatly affects the amount of erosion that occurs. If soil is improperly stored or transported, wind and water can erode soil. Therefore, construction impacts for solids processing would be potentially significant, and this issue will be addressed in the EIR/EIS at the program level. Once the solids processing digesters are operating, there would be no potential for wind or water erosion to occur. The area around the digesters would be completely impervious and covered with concrete or asphalt. All stormwater and wash water would be collected by the storm drain system and would not be diverted to pervious surfaces where they could result in water erosion. Therefore, operational impacts of solids processing would be less than significant and will not be addressed in the EIR/EIS at the program level.

Operation of biosolids management at the JWPCP would continue as it currently does in the existing buildings. The increase in truck trips to/from the JWPCP would not result in wind and water erosion. Biosolids management would increase composting, land application, and activities at landfills within the JOS service area and areas outside the JOS service area. The land application and beneficial use locations are generally located in areas dominated by agriculture or in light industrial/commercial areas. The actual land use application or beneficial use would occur on existing agricultural land or in existing buildings. The Sanitation Districts would only use sites that are properly permitted and for which all site-specific impacts, including the potential for wind and water erosion, have been mitigated thoroughly through either preparation of site-specific environmental documents or compliance with other federal, state, and local regulations. Therefore, operation of biosolids management at the JWPCP and at beneficial use locations would not have an impact on wind or water erosion. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**GEO-6. Overall Determination: Less Than Significant Impact.** Construction and operation of the program elements would not result in unstable earth conditions or changes to geologic substructure. Therefore, construction and operational impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the improvements to the conveyance system would require trenching and excavation to reach and improve approximately 33 miles of non-contiguous conveyance system infrastructure. All construction would generally occur within the public rights-of-way of existing streets. The Sanitation Districts currently maintain and improve the conveyance system throughout the JOS service area using standard practices and procedures. The Sanitation Districts would implement required construction safety standards, including construction setbacks and shoring to ensure stable earth conditions during construction of the conveyance improvements. Therefore, construction of the conveyance system would not result in unstable earth conditions or changes in geologic substructure. Construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level. Operation of the improvements to the conveyance system would be completely underground and within a self-contained system, as under current operations. Therefore, operation of the conveyance improvements would not result in unstable earth conditions or changes in geologic substructure. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LBWRP, and LCWRP would be within the existing footprints of the WRPs. The WRPs are fully developed with existing infrastructure. Construction would involve soil excavation at all WRPs, which could result in the creation of temporary slopes and pits at the excavation sites. As they currently do for all construction activities within the JOS service area, the Sanitation Districts would implement required construction safety standards, including construction setbacks and shoring to ensure stable earth conditions during construction. Construction of the plant expansion and the process optimization facilities would not result in unstable earth conditions or a change in geology substructure with the application of the current construction practices of the Sanitation Districts. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level. For

a discussion of landslide and mudslide impacts associated with construction and operation of POWRP process optimization, refer to GEO-1 (Program).

Operation of the plant expansion at the SJCWRP would occur within enclosed, self-contained structures, piping, and ancillary equipment. Process optimization would consist of underground storage tanks for wastewater, piping, and ancillary equipment that would be self-contained and would provide for additional efficiency in the wastewater treatment process. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Operation of WRP effluent management would consist of an increase or decrease in the volume of tertiary treated effluent discharged from each of the WRPs using existing designated discharge points. Discharge would not occur at new areas. A change in volume of discharge would not result in unstable earth conditions or changes to geologic substructure. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction of solids processing digesters would occur within the existing footprint at the JWPCP. The JWPCP is fully developed with existing infrastructure. Construction of the solids processing digesters would involve cut and fill. This construction could result in the creation of temporary slopes and pits at the excavation sites. As they currently do for all construction activities within the JOS service area, the Sanitation Districts would implement required construction safety standards, including construction setbacks and shoring to ensure stable earth conditions during construction. Construction would not result in unstable earth conditions or a change in geology substructure with the application of the Sanitation Districts current construction practices. Therefore, construction impacts of the solids processing digesters would be less than significant and will not be addressed in the EIR/EIS at the program level. Once the digesters are built, they would be stationary, self-contained structures. Therefore, under operating conditions, impacts would not occur and will not be addressed in the EIR/EIS at the program level.

An increase in the biosolids processed at the JWPCP would require an increase in truck trips to transport the biosolids from the JWPCP to beneficial use and disposal locations. The increase in truck trips would not result in unstable earth conditions or changes in geologic substructure. Land application of biosolids and beneficial use would occur on existing agricultural lands and within existing beneficial use buildings. Therefore, these activities would not result in unstable earth conditions or changes in the geologic substructure. Construction and operational impacts associated with biosolids management would not occur and will not be addressed in the EIR/EIS at the program level.

**GEO-7. Overall Determination: Potentially Significant Impact.** Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level. Operation of several of the program elements could be located in soil characterized by shrink-swell potential (i.e., expansive soil) that might result in damage to foundations or structures. Therefore, operational impacts related to these program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | X |
| SJCWRP – Plant Expansion | – | X |
| WRP – Process Optimization | – | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | X |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Shrink-swell potential (also known as expansive soils) is the quality of soil that determines its volume change when it experiences a change in moisture content. Shrink-swell in soils is measured by the volume change resulting from the shrinking soil when it dries and by the expanding soil as it takes up moisture. The volume change behavior of soils is influenced by the amount of moisture change, the amount of clay in the soil, and the type of mineral in the clay. In general, the soil with the highest clay content shrinks and swells the most. In the JOS service area, three soils are considered highly expansive (Cropley, Ramona-Placentia, and Diablo-Altamont).

Improvements to the conveyance system would be constructed using trenching within public rights-of-way in existing streets. The actual construction of the improvements could result in the discovery of soils with shrink-swell potential, but the construction would not result in the damage to structures (i.e., infrastructure that would be replaced or added). However, should shrink-swell soils be discovered, the operation of the improvements to the conveyance system could result in damage to the infrastructure. The Sanitation Districts have standard construction practices and design procedures to reduce damage to their facilities; however, it is unknown where exactly the shrink-swell soils may occur. Therefore, while construction impacts would not occur, operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

**WRPs.** See shrink-swell discussion above under Conveyance System. The LCWRP has soils with a moderate shrink-swell potential (Jones & Stokes 1994). The shrink-swell potential of the soils located at the SJCWRP, POWRP, and LBWRP is currently unknown. All of these facilities have highly disturbed natural soil settings that now primarily consist of artificial fill. Therefore, construction impacts would not occur and will not be addressed in the EIR/EIS at the program level.

See shrink-swell discussion above under Conveyance System as it applies to the construction and operation of the expansion of SJCWRP and process optimization at the SJCWRP, POWRP, LBWRP, and LCWRP. Operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

Operation of WRP effluent management would consist of an increase or decrease in the volume of tertiary treated effluent discharged from each of the WRPs using existing designated discharge points. A change in volume of discharge would not result in damage to structures due to shrink or swell of underlying soil. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See shrink-swell discussion under Conveyance System as it applies to the JWPCP. The JWPCP has soils with relatively high expansion soil potential (Fugro 2011). Therefore, while construction impacts would not occur, operational impacts associated with solids processing would be potentially significant and will be addressed in the EIR/EIS at the program level.

An increase in the biosolids processed at the JWPCP would require an increase in truck trips to transport the biosolids from the JWPCP to beneficial use and disposal locations. The increase in truck trips would not result in damage to structures due to soil shrink-swell potential. Land application of biosolids and beneficial use would occur on existing agricultural lands and within existing beneficial use buildings. Therefore, these activities would not result in damage to structures associated with shrink-swell potential. Construction and operational impacts associated with biosolids management would not occur and will not be addressed in the EIR/EIS at the program level.

**GEO-8. Overall Determination: No Impact.** There are no prominent geologic or topographic features within or near any of the program elements. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the conveyance improvements would generally take place in existing urban areas and within the existing rights-of-way of public streets. There are typically no distinct or prominent geologic features within the public rights-of-way of streets. Once operational, the conveyance system would be located underground. Therefore, construction and operation of the conveyance improvements would not destroy, permanently cover, or materially destroy a distinct and prominent geologic or topographic feature. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** The program elements would be constructed and operated within currently developed WRPs. Distinct and prominent geological or topographic features do not exist within any of the WRP footprints. Because these elements would be located within existing wastewater treatment infrastructure, they would not destroy, permanently cover, or materially and adversely modify one or more distinct and prominent geologic or topographic feature. Construction and operational impacts would not occur on unique geologic or topographic features as a result of plant expansion at the SJCWRP or process optimization at the SJCWRP, POWRP, LCWRP, or LBWRP and will not be addressed in the EIR/EIS at the program level.

WRP effluent management may result in an increase or decrease in volume of treated effluent from the WRPs. However, the discharge would occur at existing discharge points and the increase or decrease would generally not alter the existing channels (see discussion above regarding erosion and Hydrology, Water Quality (Freshwater), and Public Health [Section IX] for additional information regarding discharges and impacts associated with volume changes). Therefore, operation of WRP effluent management would not destroy, permanently cover, or materially destroy a distinct and prominent geologic or topographic feature and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The expansion of solids processing and the increase in biosolids management would occur within the existing footprint of the JWPCP and beneficial use locations. There are no unique geological or topographical features within the JWPCP or adjacent to the JWPCP. Since solids processing and biosolids management would be located within existing JWPCP and existing beneficial use locations, these program elements would not destroy, permanently cover, or materially and adversely modify one or more distinct and prominent geologic or topographic features. Therefore, there would be no impact associated with the construction and operation of the solids processing digesters and the operation of biosolids management. This issue will not be addressed in the EIR/EIS at the program level.

**GEO-9. Overall Determination: No Impact.** Construction and operation of all program elements would not result in the loss of availability of a known mineral resource of value to the region or state. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Although it is unknown exactly where the conveyance system would be improved, the conveyance system is generally located within existing public rights-of-way of streets in the JOS service area. Therefore, construction would occur within these rights-of-way. Trenching and digging would be required to improve the conveyance system. Public streets are generally not designated as areas of mineral resources with significance to the state. Furthermore, the streets within the JOS service area are typically located in urban areas. Should any minerals be discovered within the public right-of-way during construction, the conveyance improvements would not preclude the extraction of the minerals. Therefore, construction and operational impacts of the conveyance system would not result in the loss of availability of a known mineral resource and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction of the plant expansion at SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. The WRPs are located in areas mapped by the State of California Department of Conservation Division of Mines and Geology as Mineral Resource Zones (MRZ) -1 and MRZ-3 (1994). MRZ-1 consists of areas of no mineral resource significance, and MRZ-3 consists of areas of undetermined mineral resource significance. Furthermore, the naturally occurring soils at the existing facilities have been extensively altered over time with excavation and the introduction of artificial fill. Therefore, construction and operational impacts on mineral resources of value to the region and residents of the state would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP is located north and outside of the designated boundaries of the Wilmington Oil Field and, therefore, construction activities associated with solids processing would not have an impact on the oil field (Hesson and Olilang 1990). The construction and operation of the solids processing digesters would occur on existing developed land within the footprint of the existing facility. Therefore, construction and operation would not have an impact on important mineral resources. Construction and operational impacts associated with the solids processing digesters would not occur and will not be addressed in the EIR/EIS at the program level.

Refer to GEO-5 for a discussion of biosolids operation at the JWPCP and beneficial use locations. Operation of biosolids management would not have an impact on important mineral resources and will not be addressed in the EIR/EIS at the program level.

**GEO-10. Overall Determination: No Impact.** Construction and operation of all program elements would not result in the loss of availability of a locally important mineral resource recovery site. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** See GEO-9 (Program). Construction and operation of the program elements would not result in the loss of availability of a locally important mineral resource as they would generally occur in existing public rights-of-way or on existing developed land within the footprint of existing facilities. The existing developed land has been extensively altered over the years and, therefore, there are no locally important mineral resources located at the facilities. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

## Geology and Soils/Mineral Resources Project Discussion

**GEO-1. Overall Determination: Potentially Significant Impact.** Construction and operation of all project elements could expose people, structures, or property to major geologic hazards such as landslides, mudslides, or ground failure. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**Tunnel Alignments – Onshore and Offshore.** Construction of onshore and offshore tunnels would include crossing fault lines. Therefore, construction of the onshore and offshore tunnels would have the potential to expose people to ground failure. Under operating conditions, the onshore and offshore tunnels could also be exposed to ground failure. Therefore, construction and operation of the onshore and offshore tunnels could expose people or structures to ground failure and impacts would be potentially significant. Construction and operational impacts will be addressed in the EIR/EIS at the project level.

**Shaft Sites.** The Royal Palms shaft site is located at the base of a coastal bluff. None of the shaft site locations are within designated landslide areas; however, they could be exposed to ground failure during construction and operation (California Department of Conservation 1999e, 1999f). Therefore, construction and operational impacts associated with any shaft site would be potentially significant and will be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Areas.** Construction and operational impacts associated with the SP Shelf and PV Shelf riser and diffuser and rehabilitation of the existing ocean outfalls would be potentially significant and will be addressed in the EIR/EIS at the project level.

**GEO-2. Overall Determination: Potentially Significant Impact.** Construction and operation of all project elements could be located in an earthquake fault zone, a known active fault zone, or an area characterized by surface rupture. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be address in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** There are many faults within proximity of the project elements. The Palos Verdes Fault and Cabrillo Fault are located in proximity to project shaft sites. Furthermore, some of the onshore and offshore tunnels would cross both the Palos Verdes Fault and the Cabrillo Fault at certain points. Construction and operational impacts associated with all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

**GEO-3. Overall Determination: Potentially Significant Impact.** Construction and operation of all project elements could expose people or structures to a potential substantially adverse effect, including the risk of loss, injury, or death involving strong seismic ground shaking. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** See Geo-2 (Project). It is reasonable to expect a strong ground motion seismic event within the life of the project because it is located in southern California, which is an area known for seismic activity. Construction and operational impacts associated with all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

**GEO-4. Overall Determination: Potentially Significant Impact.** Construction and operation of all the project elements could expose people or structures to substrate consisting of materials that are subject to liquefaction or other secondary seismic hazards in the event of ground shaking. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be address in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** Several of the project shaft sites (specifically Southwest Marine, LAXT, and TraPac) are within liquefaction zones (City of Los Angeles Navigate LA 2009). The JWPCP East and JWPCP West shaft sites are not located in a liquefaction zone, but are located next to one (City of Los Angeles Navigate LA 2009). The tunnel alignments may also extend through liquefaction zones. Therefore, construction and operational impacts of all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

**GEO-5. Overall Determination: Potentially Significant Impact.** Construction of several project elements could substantially accelerate natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition, which would not be contained or controlled on site. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore and Offshore.** Construction and operation of the tunnels would occur in the subsurface and thus would not expose soils to wind or water erosion. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Construction at the shafts would involve the removal of large amounts of soil to excavate the shaft sites. During construction at any shaft site, earth-moving operations could increase short-term wind and water erosion at the sites. The storage and movement of soil greatly affects the amount of erosion that occurs. If soil is improperly stored or transported, wind and water can erode soil. See HYD-1, HYD-5, and HYD-7 (Program and Project) for more information on the stormwater pollution prevention plan (SWPPP), which controls water erosion. However, construction impacts would be considered potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the shaft sites would consist of a belowground access structure and potentially limited aboveground facilities, such as pumps and pipes. The shaft sites would essentially be returned to their existing conditions. Most of the shaft site locations are fully developed with asphalt or pavement or have

disturbed soil conditions with ruderal characteristics. Therefore, operation at any shaft site would not result in the substantial acceleration of wind and water erosion. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** The construction and operation of the riser and diffuser on the SP Shelf or the PV Shelf and rehabilitation of the existing ocean outfalls would be located under or on the ocean floor. Because of their location in the ocean, construction and operation of these project elements would not substantially accelerate the process of wind and water erosion. Therefore, no impacts would occur under the construction and operation of the riser and diffuser or the rehabilitation of the existing ocean outfalls and will not be addressed in the EIR/EIS at the project level. For a discussion of marine sediment characteristics and impacts on marine sediment, refer to MAR-2 (Project).

**GEO-6. Overall Determination: Potentially Significant Impact.** Construction and operation of all project elements could result in unstable earth conditions or changes in geologic substructure. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** Construction and operation of the project elements includes extensive subsurface construction. Therefore, construction and operational impacts of all project elements could result in unstable earth conditions or changes to the geologic substructure. Impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**GEO-7. Overall Determination: Potentially Significant Impact.** Construction and operation of several project elements have the potential to be located in soil characterized by shrink-swell potential that might result in damage to structures. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**Tunnel Alignments – Onshore and Offshore.** Shrink-swell is that quality of the soil that determines its volume change with change in moisture content. Shrink-swell in soils is measured by the volume change resulting from the shrinking soil when it dries and by the expanding soil as it takes up moisture (Jones & Stokes 1994). The volume change behavior of soils is influenced by the amount of moisture change, the amount of clay in the soil, and the type of mineral (e.g., montmorillinite) in the clay. In general, the soil with the highest clay content shrinks and swells the most, although the type of clay is an important

contributing factor (Jones & Stokes 1994). Damage to buildings, such as cracking of foundations, could result from differential movements and several alternating periods of shrink and swell. Regionally, three soil associations (Cropley, Ramona-Placentia, and Diablo-Altamont) have soils that are considered highly expansive.

The onshore and offshore tunnels would generally extend through the following geologic formations:

- Pleistocene (Lakewood Formation, San Pedro Sand, and Timms Point Silt) sediment deposits of unconsolidated sand and silt (Parsons 2011)
- Miocene (Monterey Formation) marine sedimentary rock deposits of mudstone, shale, and fine-grained rock extensively folded and faulted with the offshore Palos Verdes Anticlinorium (Parsons 2011)
- Miocene (Monterey Formation) marine sedimentary rock deposits of mudstone, shale, and fine-grained rock (Parsons 2011)

These formations are generally not known for their high clay content. Therefore, the probability for shrink-swell potential is considered low. Furthermore, the onshore and offshore tunnels would be designed to withstand movement of soil and the subsurface. Therefore, construction and operational impacts associated with the onshore and offshore tunnels would be less than significant and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites, All Riser/Diffuser Areas.** Soil characteristics at the shaft sites and offshore riser and diffuser could shrink and swell. Therefore, construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**GEO-8. Overall Determination: Potentially Significant Impact.** Construction at the Angels Gate and Royal Palms shaft sites and at the riser and diffuser areas could modify one or more distinct and prominent geologic or topographic feature. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**Tunnel Alignments – Onshore and Offshore.** There are no hilltops, ridges, canyons, rock outcrops, streambeds, or wetlands located in the subsurface. Therefore, construction and operation of the onshore and offshore tunnels could not have an impact on any distinct or prominent geologic or topographic features. This issue will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East, JWPCP West, TraPac, LAXT, and Southwest Marine.** There are no distinct or prominent geologic or topographic features located at the JWPCP East, JWPCP West, TraPac, LAXT, and Southwest Marine shaft sites. These sites are located within urban areas on existing developed locations. Therefore, construction and operation at these shaft sites would result in no impacts and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – Angels Gate and Royal Palms; All Riser/Diffuser Areas.** The Angels Gate shaft location would be constructed on an area with steep hillsides along coastal bluffs. The Royal Palms shaft site would also be constructed in a coastal bluff area. The riser and diffuser areas would be constructed in areas of the PV Shelf and SP Shelf that are previously undisturbed. Therefore, construction impacts on these project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Once operational, the shaft would consist of a belowground access structure and the riser and diffuser would be located underground or below the ocean floor and would transport treated effluent from the JWPCP for discharge to the Pacific Ocean. Therefore, operation of these project elements would not destroy or materially and adversely modify an existing geologic or topographic feature. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**GEO-9. Overall Determination: No Impact.** Construction and operation of all project elements would not result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state. Therefore, no impacts would occur and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore; All Shaft Sites.** The Wilmington Oil Field is the largest oil field in California (Crowder and Olson 1978). It is located about 20 miles south of downtown Los Angeles and encompasses all of the Long Beach Harbor and most of the Los Angeles Harbor (Crowder and Olson 1978). The oil field is located in some middle Miocene and early Pliocene sediments (Parsons 2011). The oil field has eight separate producing zones with a range of depths. Generally, the oil-producing zones are found well below 1,000 feet bgs, at depths between 2,500 and 4,000 feet bgs (Crowder and Olson 1978).

Construction at the shaft sites and onshore tunneling would be located above the existing Wilmington oil-producing field sediments. The shaft sites would generally extend from the ground surface to depths between 50 and 245 feet bgs. The onshore tunnels would be located at depths between 70 and 450 feet bgs. Therefore, the shaft sites and the onshore tunnel would be located above the oil-producing sediments. Because the depths of the shaft site and tunnels would be relatively shallow compared to the location of the oil-producing sediment of the Wilmington Oil Field, the shaft sites and tunnel would not have an impact on the oil field. For a discussion of abandoned and producing oil wells within or adjacent to the project element locations, see UTL-5 and UTL-3 (Project). Furthermore, the construction and operation of the onshore tunnels and shafts would not preclude the exploration or access to subsurface mineral resources. The Wilmington Oil Field could still be accessed and explored for extraction purposes even with the construction and operation of the onshore tunnels and shafts. Therefore, construction and operation of the project elements would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Tunnel Alignments – Offshore; All Riser/Diffuser Areas.** The offshore tunnel alignments would be located below the seafloor and the riser and diffuser locations would be located offshore on either the SP Shelf or PV Shelf. Therefore, the offshore tunnel alignments and riser and diffuser locations would

not be located within proximity of the Wilmington Oil Field and would not have an impact on this known mineral resource. Furthermore, the construction and operation of the offshore tunnel and riser and diffuser would not preclude the exploration or access to subsurface mineral resources. Any undiscovered mineral resource off the coast of California could still be accessed and explored for extraction purposes even with the construction and operation of these project elements. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**GEO-10. Overall Determination: No Impact**. Construction and operation of all the project elements would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore; All Shaft Sites.** See GEO-9 (Project) regarding the Wilmington Oil Field. The City of Los Angeles General Plan does not identify any locally important mineral resources in either the communities of San Pedro or Wilmington or the Port of Los Angeles (City of Los Angeles 1999b; City of Los Angeles 1990; City of Los Angeles 1999c; and City of Los Angeles 1992). The city of Carson does not identify any additional locally important mineral resource other than the Wilmington Oil Field (City of Carson 2004). Therefore, the project elements would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Tunnel Alignments – Offshore; All Riser/Diffuser Areas.** See GEO-9 (Project). There are no known locally important mineral resource recovery sites delineated on a local general plan, specific plan, or other land use plan for areas located below the seafloor or on the SP Shelf and PV Shelf. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Greenhouse Gas Emissions Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **VII.** | **GREENHOUSE GAS EMISSIONS.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| GHG-1. | Generate greenhouse gas emissions, either directly or indirectly, above 10,000 metric tons of $CO_2e$ per year, where emissions include direct, indirect, and, to the extend information is available, life cycle emissions during construction and operation? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| GHG-2. | Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing greenhouse gas emissions? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Greenhouse Gas Emissions Program Discussion

**GHG-1 and GHG-2. Overall Determination: Potentially Significant Impact.** All program elements, except conveyance system and WRP effluent management, would produce emissions during construction and operation that could exceed thresholds. Therefore, impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | X |
| JWPCP – Biosolids Management | N/A | X |

**All Program Elements (except Conveyance System and WRP Effluent Management).** Construction of plant expansion at the SJCWRP; process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP; and solids processing facilities at the JWPCP could generate greenhouse gas emissions either directly or indirectly that may have a significant impact on the environment as discussed in AQ-1 (Program) through AQ-6 (Program). Therefore, the impacts of construction of all program elements, except conveyance system and WRP effluent management, would be potentially significant and will be addressed in the EIR/EIS at the program level.

Operation of plant expansion, process optimization, solids processing, and biosolids management could generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Operation of the conveyance improvements is unlikely to emit greenhouse gas emissions that could exceed thresholds because it transports wastewater in sewer lines. However, the greenhouse gas analysis will evaluate operational activities of all program elements (except WRP effluent management as discussed below) for all thresholds in the EIR/EIS at a program level.

**Conveyance System.** Conveyance system improvements could occur at any point between 2018 and the planning horizon of 2050 and would occur on an as-needed basis. Therefore, activities associated with the conveyance system are considered to be too speculative to determine where and when those improvements would occur. These improvements would be subject to project-level review prior to construction. Therefore, impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level. The conveyance system currently does not contribute to GHG emissions under operating conditions and would not contribute to GHG emissions once improvements became operational because the conveyance system generally utilizes gravity flow. Therefore, operational impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

**WRP (Effluent Management).** During operations, there may be an increase or decrease in treated effluent discharged into the receiving waters at each WRP under effluent management. The effluent would be discharged through existing discharge points and pipes. Therefore, WRP effluent management would not result in construction or operation greenhouse gas emissions, and impacts would not occur under any of the thresholds. This issue will not be addressed in the EIR/EIS at the program level.

## Greenhouse Gas Emissions Project Discussion

**GHG-1 and GHG-2. Overall Determination: Potentially Significant Impact.** All project elements would produce emissions during construction and operation that could exceed thresholds. Therefore, impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** Construction of all project elements could generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment as discussed in AQ-1 (Project) through AQ-6 (Project). Construction impacts from the project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

Operation of the project would likely not generate greenhouse gas emissions because it would generally consist of passive water flow; however, all project elements will be addressed in the EIR/EIS at the project level.

## Hazards and Hazardous Materials Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **VIII.** | **HAZARDS AND HAZARDOUS MATERIALS.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| HAZ-1. | Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| HAZ-2. | Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| HAZ-3. | Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| HAZ-4. | Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| HAZ-5. | Result in a substantial spill, release, or explosion of hazardous material(s) due to a terrorist action? | ☒ | ☐ | ☐ | ☐ | ☒ | ☐ |

| VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the program/project: | Program | | | Project | | |
|---|---|---|---|---|---|---|
| | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| HAZ-6. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |

Hazardous materials are generally the raw materials for product or process that may be classified as toxic, flammable, corrosive, or reactive. Department of Transportation (DOT) Hazardous Materials Regulations cover all aspects of hazardous materials packaging, handling, and transportation (49 CFR Parts 100–185). The California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control is authorized by the EPA to enforce and implement federal hazardous materials laws and regulations (California Health and Safety Code, Division 20, Chapter 6.5). Hazardous materials that may be stored, handled, or transported are classified by the following:

- Corrosive materials—solids, liquids, or gases that can damage living material or cause fire.
- Explosive materials—any compound that is classified by the National Fire Protection Association (NFPA) as an A, B, or C explosive.
- Oxidizing materials—any element or compound that yields oxygen or reacts when subjected to water, heat, or fire conditions.
- Toxic materials—gases, liquids, or solids that may create a hazard to life or health by ingestion, inhalation, or absorption through the skin.
- Unstable materials—those materials that react from heat, shock, friction, contamination, etc., and are capable of violent decomposition or autoreaction but are not designed primarily to be explosives.
- Radioactive materials—those materials that undergo spontaneous emission of radiation from decaying atomic nuclei.
- Water-reactive materials—those materials that react violently or dangerously upon exposure to water or moisture.

Soil and groundwater that becomes contaminated through the release or spill of hazardous materials can also be considered hazardous depending on the level of contamination and the regulatory thresholds for the particular hazardous material that is released.

## Hazards and Hazardous Materials Program Discussion

**HAZ-1. Overall Determination: Potentially Significant.** Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level. Operation of the SJCWRP expansion could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Therefore, operational impacts related to the SJCWRP expansion would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | X |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Hazardous materials could be present on site during the construction of the conveyance improvements, and these types of materials include diesel and lubricants. These materials would only be used periodically and temporarily during construction; therefore, they would not be routinely transported, used, or disposed. A discussion of hazardous materials that could be present on site during construction of the improvements to the conveyance system is included in HAZ-3 (Program).

Trenching and soil excavation would be required for the improvements to the conveyance system throughout the JOS service area. Currently, the Sanitation Districts regularly and frequently use standard practices to determine, handle, and dispose of any contaminated soil found during construction. Any contaminated soil found during the conveyance system upgrades would be subject to all of these regularly employed practices by the Sanitation Districts. Therefore, impacts associated with contaminated soil found during construction of the conveyance improvements would be less than significant and will not be addressed in the EIR/EIS at the program level.

Once operational, the conveyance system would generally transport sewage to the WRPs by gravity. The transport includes accepting wastewater from industrial facilities that treat and release industrial effluent into the Sanitation Districts' conveyance system. The industrial facilities located within the JOS service could use hazardous materials in their routine daily practices and processes. All hazardous materials disposed of within the conveyance system are highly regulated by the Clean Water Act as point source pollution. The discharge from the point sources into the conveyance system is regularly monitored and tested, and the results are reported to the Sanitation Districts to ensure industrial facilities are meeting their wastewater treatment requirements under the Clean Water Act and state regulations. The conveyance system could accept an increased volume of treated industrial effluent via the improvements. However, because industrial effluent is treated and highly regulated, the increase in volume would not result in an increase in hazardous materials within the effluent. Therefore, the operation of the conveyance system improvement would not involve any defined hazardous materials. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction of plant expansion at the SJCWRP and process optimization facilities at the SJCWRP, POWRP, LCWRP, and LBWRP would not result in the routine transport, use, or disposal of hazardous materials. A discussion of hazardous materials that could be present during construction at the WRPs is included under HAZ-3 (Program). These materials include diesel and lubricants that would aid in construction activities. These materials would only be used periodically and temporarily during construction of the program elements; therefore, they would not be routinely transported, used, or disposed. As discussed for the conveyance system, the Sanitation Districts regularly use standard practices to determine, handle, and dispose of contaminated soil found during construction. None of the WRPs are sites included on a list of hazardous materials (see HAZ-2 [Program] for additional details). Therefore, it is unlikely contaminated soil would be discovered during excavation activities associated with the expansion or process optimization at the SJCWRP and the other WRPs. However, if contaminated soils are discovered, the Sanitation Districts would use their regularly employed practices to contain the contaminated soil or groundwater and to appropriately remove it. Therefore, construction would not create a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials. Construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Chemicals are used at the WRPs to treat wastewater. Depending on the quantities of hazardous materials stored on site, either a business plan or a California Accidental Release Program (CalARP) Risk Management Plan (RMP) is submitted to the local agency with the delegated authority for that program. Furthermore, federal RMPs are required at two of the WRPs due the quantities of hazardous materials stored, handled, and used. Table 3-3 summarizes the hazardous material regulatory program applicable to each JOS treatment facility, including the associated primary hazardous chemicals triggering regulatory thresholds.

**Table 3-3. Hazardous Materials Regulatory Program at the JOS Treatment Facilities**

| Treatment Facility | Chlorine (Gas) | Sodium Hypochlorite (Liquid) | Sulfur Dioxide (Gas) | Sodium Bisulphite (Liquid) | Aqueous Ammonia (Liquid) | Applicable Program | Delegated Authority |
|---|---|---|---|---|---|---|---|
| SJCWRP | X | | X | | X | CalARP RMP<br>Federal RMP | Los Angeles Co. Fire Dept.<br>EPA |
| POWRP | | X | | X | X | Business Plan | Los Angeles Co. Fire Dept. |
| LCWRP | X | | X | | X | CalARP RMP<br>Federal RMP | Los Angeles Co. Fire Dept.<br>EPA |
| LBWRP | | X | | X | X | CalARP RMP | City of Long Beach Fire Dept. |
| WNWRP | | X | | X | X | Business Plan | Los Angeles Co. Fire Dept. |
| JWPCP | | X | | | | Business Plan | Los Angeles Co. Fire Dept. |

The operation of process optimization at all WRPs would not change the volume of hazardous materials stored. Therefore, impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Operation of the plant expansion at SJCWRP would increase the volume of chlorine used on site to disinfect wastewater effluent. Since the volume of chlorine would change at the SJCWRP, the RMP would likely need to be updated. There could be an increased hazard to the public or environment through the routine use of chlorine. Therefore, operational impacts of plant expansion at the SJCWRP would be potentially significant and will be addressed in the EIR/EIS at the program level.

Construction would not occur under WRP effluent management. Operation would simply consist of a change in the volume of tertiary treated effluent from existing discharge points into receiving waters. Therefore, operation of WRP effluent management would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See HAZ-1 (Program) and HAZ-3 (Program) regarding the types of hazardous materials that could be used during construction of the solids processing facilities and standards regarding the containment and handling of contaminated soil or groundwater (if found) during construction. Construction of the solids processing digesters at the JWPCP would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

At the JWPCP, chemicals are currently used to treat the wastewater to appropriate levels. Specifically, the JWPCP handles and uses large amounts of chlorine in the form of sodium hypochlorite (bleach) to disinfect wastewater effluent before it is discharged into the Pacific Ocean. The plant has a hazardous materials inventory (HMI) statement and a consolidated contingency plan, as well as a business plan, to properly manage and control this hazardous material. However, since sodium hypochlorite is not used in solids processing or biosolids management, there would be no increase in the amount of it used at the JWPCP under solids processing or biosolids management. Since there would be no change to the existing setting under operating conditions, impacts would not occur.

Biosolids management would result in an increase in the amount of biosolids handled and transported at the JWPCP. The EPA regulates biosolids through 40 CFR Part 503. Biosolids are not considered a hazardous material. Therefore, the operation of solids processing facilities and biosolids management at the JWPCP would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**HAZ-2. Overall Determination: Less Than Significant Impact.** All program elements are not located on a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 6596.2. Therefore, construction and operational impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The conveyance system would include improvements to approximately 33 miles of JOS trunk sewer lines. Construction of the improvements would generally result in excavation of soil within the public right-of-way of existing streets. It is unknown exactly where the construction of the conveyance improvements would occur and whether these locations might be a site on a list of hazardous materials sites. However, as discussed under HAZ-1 (Program), should any contaminated soil be found during construction, the Sanitation Districts would use standard practices to properly determine, handle, and dispose of the soil. Therefore, construction and operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** The program facilities are not identified in any of the California hazardous materials databases. A search of SJCWRP (1965 Workman Mill Road), LCWRP (16515 Piuma Avenue), LBWRP (7400 E. Willow Street), and POWRP (295 Humane Way) in the California EPA Cortese List as a Department of Toxic Substance and Control Hazardous Waste Site did not yield any results (CalEPA 2009a). Additionally, none of the aforementioned site addresses are listed in the EnviroStor database of hazardous substances release sites (CalEPA 2009b). Geotracker, the California database of leaking underground storage tanks (LUSTs), does not report any LUSTs at the program facility locations; however, within the vicinity of the SJCWRP and the LCWRP, two LUST cases were reported. These cases have since been completed and closed and would not present any hazardous issues to those WRP program areas (SWRCB 2009). Finally, there are no active cease and desist orders or clean up and abatement orders for hazardous materials/facilities within the program facility locations (CalEPA 2009c). Since the program facilities are not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, construction and operation at these facilities would not create a significant hazard to the public or the environment. Additionally, WRP effluent management would simply consist of a change in the volume of tertiary treated effluent from existing discharge points into receiving waters. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The JWPCP site, located at 212 W. Lomita Blvd, is included on the Cortese List; this will be further discussed in the HAZ-2 (Project) discussion because it is in an area related to the project (CalEPA 2009a) and not the program. See HAZ-1 (Program) for a discussion of the Sanitation Districts standard practices to determine, handle, and dispose of contaminated soil. These standard practices would be employed during the construction and soil excavation associated with the solids processing digesters.

Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level. See HAZ-1 (Program) for a discussion of operational impacts associated with solids processing digesters and biosolids management. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**HAZ-3. Overall Determination: Potentially Significant**. Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level. Operation of the SJCWRP could result in a reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment through the increased use of chlorine to disinfect the wastewater effluent. Therefore, operation of the SJCWRP would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | X |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the conveyance improvements would involve the handling and use of some hazardous materials including fuel, lubricants, and diesel. Existing regulations, such as CCR Title 22 and Title 26, and the California Hazardous Waste Control Law, would govern proper containment, spill control, and disposal of hazardous waste generated during construction activities. Implementation of increased inventory accountability, spill prevention controls, and waste disposal controls associated with these regulations would limit both the frequency and severity of potential releases of hazardous materials. In addition, construction would comply with the Los Angeles County and cities of Pomona, Long Beach, and Cerritos fire codes, as well as other jurisdictions within the JOS service area, which regulate the construction of buildings, and local municipal public property code, which regulates the discharge of materials into the sanitary sewer and storm drain. The latter requires the construction of spill-containment structures to prevent the entry of forbidden materials, such as hazardous materials, into sanitary sewers and storm drains. Implementation of increased spill prevention controls, spill release notification requirements, and waste disposal controls associated with these regulations would limit the potential releases of hazardous materials.

Standard best management practices (BMPs) would also be used during construction activities to minimize runoff of contaminants, in compliance with the State General Permit for Stormwater Discharges Associated with Construction Activity (Water Quality Order 99-08-DWQ) and the project-specific SWPPP. Construction activities would be conducted using BMPs in accordance with city and county guidelines. Applicable BMPs include, but are not limited to, vehicle and equipment fueling and maintenance; material delivery, storage, and use; spill prevention and control; solid and hazardous waste management; and contaminated soil management. Program facility design and specifications would be reviewed by local fire departments for conformance to the municipal fire code as a standard practice. Implementation of increased spill prevention controls associated with these BMPs would limit the potential releases of hazardous materials.

Construction equipment that would be used to build the program facilities has the potential to release oils, greases, solvents, and other finishing materials through accidental spills. Spill or upset of these materials would have the potential to affect surrounding land uses. However, the consequences of construction-related spills are generally reduced in comparison to other accidental spills and releases. This is because the amount of hazardous material released during a construction-related spill is small, as the volume in any single piece of construction equipment is generally less than 50 gallons, and fuel trucks

are limited to 10,000 gallons or less. Construction-related spills of hazardous materials are not uncommon, but the enforcement of construction and demolition standards, including BMPs by appropriate local and state agencies (i.e., fire departments) would minimize the potential for an accidental release of petroleum products and/or hazardous materials during construction. Federal, state, and local controls have been enacted, and are enforced, to reduce the effects of potential hazardous materials spills during construction of program facilities.

Construction of the conveyance improvements would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

See HAZ-1 (Program) for a discussion of operational impacts associated with the conveyance system. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See HAZ-1 (Program) and HAZ-3 (Program) for a discussion of hazardous materials and the potential for spills to occur during construction. The Sanitation Districts have standard practices associated with determining, handling, and disposing of contaminated soil or groundwater. Therefore, construction impacts associated with the SJCWRP expansion and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would be less than significant and will not be addressed in the EIR/EIS at the program level.

Operational impacts associated with the increased volume of chlorine used at the SJCWRP could create a significant hazard to the public through a reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment. Therefore, operational impacts associated with the expansion of the SJCWRP would be potentially significant and will be addressed in the EIR/EIS at the program level. All other WRPs would not experience an increase in the volume of existing hazardous materials currently used on site and, therefore, operational impacts would not occur at the POWRP, LCWRP, or LBWRP and will not be addressed in the EIR/EIS at the program level.

Operation of WRP effluent management would simply consist of a change in the volume of tertiary treated effluent from existing discharge points into receiving waters. Therefore, WRP effluent management would not result in operational impacts and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See HAZ-1 (Program) and HAZ-3 (Program) for a discussion of hazardous materials and the potential for spills to occur during construction. The Sanitation Districts have standard practices associated with determining, handling, and disposing of contaminated soil and groundwater. Therefore, construction impacts associated with solids processing at the JWPCP would be less than significant and will not be addressed in the EIR/EIS at the program level.

See HAZ-1 (Program) for a discussion of operational impacts associated with solids processing digesters and biosolids management. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**HAZ-4. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials within 0.25 mile of an existing or proposed school. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the conveyance improvements would occur within the public rights-of-way of existing streets. It is unknown where the construction could take place within the JOS service area; therefore, construction could take place within 0.25 mile of an existing or proposed school. However, construction of the conveyance improvements would result in the temporary, limited, and periodic handling of hazardous materials typically used in construction, such as diesel or lubricants. See HAZ-1 and HAZ-3 (Program) for a discussion of these materials and the potential for accidental spills. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level. See HAZ-1 (Program) for a discussion of operational impacts associated with the improvements to the conveyance system. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** The SJCWRP, POWRP, LCWRP, and LBWRP are not located within 0.25 mile of a school (USGS Geographic Names Information Systems 2009). Therefore, construction and operation of plant expansion at the SJCWRP; process optimization at the SJCWRP, POWRP, LCWRP, LBWRP; and the operation of WRP effluent management would not emit hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or wastes within 0.25 mile of a school. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Wilmington Junior High is located approximately 0.2 mile southeast of the southeast corner of the JWPCP at the intersection of East Lomita Boulevard and North Wilmington Boulevard (USGS Geographic Names Information Systems 2009). However, the increase in biosolids production and the new solids processing digesters would be located on the western side of the JWPCP, which is more than 0.25 mile from the school. Furthermore, construction of the solids processing digesters would result in the temporary, limited, and periodic handling of hazardous materials typically used in construction, such as diesel or lubricants. See HAZ-1 and HAZ-3 (Program) for a discussion of these materials and the potential for spills during construction. Finally, the current operation of the biosolids management and solids processing do not emit hazardous substances because hazardous substances are not required for the operation of these program elements. All emissions from the biosolids production, handling, and transport are controlled through the odor control mechanisms incorporated into the existing infrastructure of the JWPCP and odors are not considered hazardous emissions. Therefore, construction and operation at the JWPCP would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. Impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

**HAZ-5. Overall Determination: Potentially Significant Impact**. Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level. Operation of the SJCWRP plant expansion could result in a substantial spill or release of chlorine as a result of a terrorist action. Therefore, operational impacts associated with the SJCWRP plant expansion would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | X |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction activities associated with improvements to the conveyance system would involve the handling and use of some volume of hazardous materials including vehicle fuels and other flammable chemicals. The potential consequence of a terrorist action on such activities would mainly concern relatively small potential targets such as construction vehicles and program facilities undergoing construction. Fuel volume in any single piece of construction equipment is generally less than 50 gallons and fuel trucks are limited to 10,000 gallons or less. The enforcement of construction and demolition standards, including BMPs by appropriate local and state agencies (i.e., fire departments) as identified in HAZ-3 (Program), would minimize the potential for a spill, release, or explosion of hazardous materials due to a terrorist action. Furthermore, the enforcement of these standards would reduce the impact should a spill, release, or explosion of hazardous material occur due to a terrorist action. Therefore, construction of the conveyance improvements would not result in a substantial spill, release, or explosion of hazardous material(s) due to a terrorist action. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level. Once the conveyance system improvements are operational, they would be located underground and would not use or otherwise transport hazardous materials. Therefore, operational impacts of the conveyance system would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See HAZ-5 (Program) for a discussion of potential releases due to a terrorist action during construction as it is relevant to construction at each of the WRPs. Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level.

As discussed in HAZ-1 and HAZ-3 (Program), the expansion of the SJCWRP would result in an increased use or volume of chlorine under operating conditions. This increase in volume could result in an accidental spill or release due to a terrorist action under operating conditions. Therefore, operational impacts associated with plant expansion at the SJCWRP would be potentially significant and will be addressed in the EIR/EIS at the program level.

Operation of WRP effluent management would simply consist of a change in the volume of tertiary treated effluent from existing discharge points into receiving waters. Therefore, WRP effluent management would not result in operational impacts and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See HAZ-5 (Program) for details regarding the potential for hazardous materials releases due to a terrorist action during construction as it is relevant to the construction of the solids processing digesters at the JWPCP. See HAZ-1 (Program) for details regarding operation of the solids processing digesters and biosolids management. A substantial spill, release, or explosion of hazardous materials would not

result during construction or operation due to a terrorist action. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**HAZ-6. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not result in exposing people or structures to wildland fires due to the fact that program elements are not located in areas designated as having high wildfire potential. Therefore, construction and operational impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the conveyance improvements would generally occur within the rights-of-way of existing streets in urban neighborhoods. Typically, the rights-of-way of existing streets are not identified as wildfire areas. Furthermore, the conveyance system is below ground and would not be damaged in a wildfire. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** The SJCWRP, POWRP, LCWRP, and LBWRP are generally not located in areas that would be subject to wildfires. The SJCWRP and LCWRP are located in developed, urbanized areas that would not be subject to wildfires. The LBWRP and POWRP are adjacent to open space areas. The LBWRP is adjacent to El Dorado Park and El Dorado Municipal Golf Course in Long Beach. El Dorado Park/Municipal Golf Course is a managed park and golf course that is regularly maintained to remove potential fuel sources and is watered on a regular basis. Construction and operation of process optimization at LBWRP would not result in a wildfire hazard. The POWRP is adjacent to Elephant Hill, which is designated as open space and is not regularly maintained. However, it is completely surrounded by development and roadways such as West Mission Boulevard, which likely would act as a fire break from any fire moving from the south. Construction and operation of process optimization at POWRP would not result in a wildfire hazard. However, this issue is carried forward to the EIR/EIS as it relates to impacts from mudflow under Impact HYD-11 in Chapter 11.

The WNWRP is located in the Whittier Narrows Recreational Area. The recreational area is a maintained recreation and park area by the County of Los Angeles and also acts as an area of flood control through the use of the Whittier Narrows Dam. No construction would occur as a result of the program at WNWRP and the operation of WRP effluent management inherently cannot be threatened by wildfires or result in the exposure of people or structures to wildfire because it is a change in volume of treated effluent discharged into receiving waters.

Therefore, construction and operation of the program elements at the WRPs would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. Impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at a program level.

**JWPCP.** The JWPCP is located in a fully developed urban area surrounded by pavement and concrete. It is not adjacent to any wildland areas or open space. Therefore, construction and operation of solids processing facilities and operation of biosolids management would not be affected by wildfires. Biosolids management at land application sites or other beneficial use locations would occur at existing sites located in agricultural or industrial and commercial areas with a low potential for wildfires to occur.

Therefore, these program elements would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. Impacts would be less than significant and will not be addressed in the EIR/EIS at a program level.

## Hazards and Hazardous Materials Project Discussion

**HAZ-1. Overall Determination: Potentially Significant Impact.** Construction of several project elements could create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

All impacts associated with the riser and diffuser and hazards (e.g., the DDT/PCB study area) are discussed in the Marine Environment Section.

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** A discussion of hazardous materials that could be present on site during construction of the tunnel alignments and at the shaft sites is included in HAZ-3 (Project). These materials include diesel and lubricants that would aid in the construction of the tunnels and at the shaft sites. These materials would only be used periodically and temporarily during construction of the project elements; therefore, they would not be routinely transported, used, or disposed.

Construction of the tunnel and at the shaft sites would likely dispose of hazardous materials in the form of contaminated soil. Construction of the project elements would involve constructing shaft sites and excavating large amounts of soil in areas with past and present industrial uses; therefore, it is likely large quantities of the soil excavated in these areas may be contaminated. Currently, the Sanitation Districts regularly and frequently use standard practices to determine, handle, and dispose of any contaminated soil found during construction. The soils would be excavated, tested on site to determine their hazardous nature, and then transported off site to an appropriate hazardous material disposal facility, if they are deemed hazardous. Furthermore, the tunnel boring machine (TBM) may use a bentonite slurry method to drill the tunnel. Generally, bentonite slurry would not be considered hazardous waste because it does not meet any of the Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics. However, if the slurry were to come into contact with contaminated soils or groundwater, the slurry may become hazardous depending on the nature of contamination encountered. It is unlikely that spent/waste bentonite slurry can be disposed of at a typical Class III municipal landfill. The spent slurry would likely have to be dried, profiled, and sent to a special landfill licensed to receive such wastes. Since the volume of contaminated soils could be large and the bentonite slurry method could become hazardous, the construction of these project elements would involve the transport or disposal of hazardous materials, which could result in a hazard to the public or environment. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

The operation of these project elements would not involve the routine handling, transport, or disposal of hazardous materials. Operation of the project elements would involve the transport of secondary treated effluent from the JWPCP to the Pacific Ocean for discharge. The secondary treated effluent is not considered a hazardous material. Therefore, operation of the project elements would not handle,

transport, or dispose of a hazardous material and operational impacts will not be addressed in the EIR/EIS at the project level.

**HAZ-2. Overall Determination: Potentially Significant Impact.** The JWPCP East shaft site is located on a list of hazardous materials sites. Therefore, construction impacts related to the JWPCP East shaft site would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore and Offshore.** The onshore and offshore tunnels would be constructed below ground surface and below the seafloor. Currently, the alignments at the proposed depths are not listed on any database of hazardous materials sites. The construction of the onshore and offshore tunnels would not act as a preferential pathway for the migration of groundwater contamination to an uncontaminated area if it were to encounter groundwater contamination. The tunneling process typically precludes this migration as the space between the tunnel liner and surrounding earth from tunnel over excavation is grouted. Once the onshore and offshore tunnels are complete, the tunnel would remain in the subsurface and would not transport hazardous materials. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Site – JWPCP East.** A search of hazardous materials databases was conducted for the shaft sites. Table 3-4 identifies that the JWPCP East site is located on a list compiled pursuant to Government Code Section 65962.5.

**Table 3-4. Hazardous Listings for the JWPCP and JWPCP East Sites**

| Project Location | GeoTracker (LUST sites) | Cortese List Department of Toxic Substance and Control Hazardous Waste Site | EnviroStor | Superfund | Cortese CDO, CAO | Existing Conditions Known |
|---|---|---|---|---|---|---|
| JWPCP and JWPCP East | Not listed | Not listed | Not listed | Not listed | Received a CDO in 1988 and a CAO in 2006 | Located on former FORCO site with existing groundwater remediation occurring. |

LUST = leaking underground storage tank
CDO = cease and desist order
CAO = cease and abate order
Source: CalEPA 2009a, CalEPA 2009b, CalEPA 2009c, SWRCB 2009.

The JWPCP has been identified on the Cortese Cease and Desist Order (CDO) and Cease and Abate Order (CAO) lists; the CDO occurred in 1988 and the CAO occurred in 2006 (CalEPA 2009c). It is more than likely that these incidences have since been addressed and no longer present any hazardous issues to the area. Furthermore, although it was not identified on any of the database searches, the JWPCP East shaft site is located on the Fletcher Oil and Refining Company (FORCO) site that has at least three

existing oil wells. The JWPCP is currently under remediation for the removal of volatile organic compounds and petroleum products that are affecting the groundwater and soil (Parsons 2011).

Therefore, construction at the JWPCP East would occur at locations identified by hazardous materials lists and as a result may potentially create a significant hazard to the public or the environment. Construction impacts would be potentially significant related to the JWPCP East shaft sites and will be addressed in the EIR/EIS at the project level.

Once operational, the JWPCP East shaft site would consist of a belowground access structure and aboveground facilities that may include a pumping plant and surge tower. The operation of the project would convey secondary treated effluent from the JWPCP to the Pacific Ocean for discharge. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP West, LAXT, TraPac, Southwest Marine, Angels Gate, and Royal Palms**. The JWPCP West, LAXT, TraPac, Southwest Marine, Angels Gate, and Royal Palms shaft sites are not located on a list of hazardous materials as summarized in Table 3-5. Several of these shaft sites are located in industrial areas (TraPac and LAXT), but the project sites have not been specifically identified on a hazardous materials list.

**Table 3-5. Hazardous Listings for the JWPCP West, TraPac, LAXT, Southwest Marine, Angels Gate, and Royal Palms Shaft Sites**

| Shaft Site | GeoTracker (LUST sites) | Cortese List Department of Toxic Substance and Control Hazardous Waste Site | EnviroStor | Superfund | Cortese CDO, CAO |
|---|---|---|---|---|---|
| JWPCP West | Not listed | Not listed | Not listed | Not listed | Not Listed |
| TraPac | Not listed | Not listed | Not listed | Not listed | Not listed |
| LAXT | LUST site; case is closed | Not listed | Not listed | Not listed | Not listed |
| Southwest Marine | Not listed, but there are two LUST sites located 1000 feet north of Southwest Marine; both cases are closed | Not listed, but an active state response site is located north of the Southwest Marine shaft site | Not listed | Not listed | Not listed |
| Angels Gate | Within vicinity of LUST site; case is currently open; but it is not located on site. | Not listed | Not listed | Not listed | Not listed |
| Royal Palms | Not listed | Not listed | Not listed | Not listed | Not listed |

LUST = leaking underground storage tank
CDO = cease and desist order
CAO = cease and abate order
Source: CalEPA 2009a, CalEPA 2009b, CalEPA 2009c, SWRCB 2009.

As shown in Table 3-5, the Southwest Marine shaft site was listed as being within the vicinity of LUST sites and one state response site. The two LUST sites located near the Southwest Marine shaft site are approximately 1000 feet north of the main project site. These two closed LUST sites are the locations of the Southwest Marine Shipyard and the Pan Pacific Fisheries; furthermore, these two sites are not located on the Southwest Marine shaft site and, therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level. Berth 240, located just north of the Southwest Marine shaft site, has been listed on the Cortese List as a Department of Toxic Substance and Control Hazardous Waste site. The status of this listing is currently active. Berth 240 was used for ship

building and ship repair. Hazardous materials located at this site include polychlorinated biphenyls (PCBs), antimony, arsenic, chromium, copper, lead, mercury, zinc, other metals, and petroleum hydrocarbons (CalEPA 2009a). As required by CalEPA's Brownfields Memorandum of Agreement, the Los Angeles Harbor Department is in the process of submitting a request of oversight to the Department of Toxic Substances Control and the regional water quality control board (RWQCB). However, because this site is not located on the Southwest Marine shaft site, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level [indirect impacts associated with possibly contaminated soil and water are discussed in HAZ-1 (Project)]. The Terminal Island Water Reclamation Plant, located in proximity to the LAXT shaft site, did have a LUST on site; however, this case is closed and would not present any significant impact on the project element (SWRCB 2009). A separate hazardous materials database search of the LAXT shaft site location was conducted in February 2007 (Parsons 2011). None of the databases searched reported a listing within the LAXT area. Because none of the sites are located at the LAXT shaft site, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HAZ-3. Overall Determination: Potentially Significant Impact.** Construction of several project elements could create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

All impacts associated with the riser and diffuser and hazards (e.g., the DDT/PCB study area) will be discussed in the Marine Environment Section.

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** Construction activities for the project elements would involve the handling and use of some volume of hazardous materials including vehicle fuels and other flammable chemicals. Fuel volume in any single piece of construction equipment is generally less than 50 gallons and fuel trucks are limited to 10,000 gallons or less. The enforcement of construction and demolition standards, including BMPs by appropriate local and state agencies (i.e., fire departments) as identified in HAZ-3 (Program), would minimize the potential for a spill, release, or explosion of hazardous materials. Furthermore, the enforcement of these standards would reduce the impact should a spill, release, or explosion of hazardous material occur.

However, construction of the project elements may involve the handling and transportation of large quantities of hazardous soils and bentonite slurry, as discussed in HAZ-1 (Project). Furthermore, construction would also involve drilling and tunneling in a known oil field (Wilmington Oil Field) with existing and abandoned oil wells and natural gas pockets. Therefore, construction of the project elements could create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

As discussed HAZ-1 (Project), the operation of the project elements would not involve handling, transport, or disposal of hazardous materials. Therefore, the operation of the project elements would not

create a significant hazard to the public through a reasonably foreseeable upset or release of hazardous materials. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HAZ-4. Overall Determination: Potentially Significant Impact.** Only one shaft site (JWPCP East) is located within 0.25 mile of an existing school. Therefore, construction impacts related to the JWPCP shaft site would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Onshore Tunnel Alignments.** The onshore tunnel alignments may be located within 0.25 mile of a school depending on the vertical distance from the ground to the top of the tunnel. However, any hazardous or contaminated materials generated or used during tunneling would be contained within the tunnel and removed at the shaft site locations. Therefore, potential impacts related to hazardous or contaminated materials would occur at the shaft sites and are discussed below. Impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Offshore Tunnel Alignments and All Riser/Diffuser Areas.** These project elements would be located under or on the seafloor. No schools exist in these locations; therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP West, TraPac, LAXT, Southwest Marine, Angels Gate, and Royal Palms**. JWPCP West, TraPac, LAXT, Southwest Marine, Angels Gate, and Royal Palms shaft sites are not located within 0.25 mile of a school. Construction and operation of these project elements would not emit hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or wastes within 0.25 mile of a school. Impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Site – JWPCP East.** The only project element within 0.25 mile of a school is the JWPCP East shaft site. As discussed in HAZ-1 (Project), the shaft site could have hazardous soils and may use a bentonite slurry mixture that would have to be separated on site and transported off site. Construction at the JWPCP East shaft site could result in handling and transporting hazardous materials within 0.25 mile of an existing school. Therefore, construction impacts at the JWPCP East shaft site would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the JWPCP East shaft site would consist of a belowground access structure with aboveground facilities that may include a pumping plant and a surge tower. The operation of the project would convey secondary treated effluent from the JWPCP to the Pacific Ocean for discharge. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HAZ-5. Overall Determination: Less Than Significant Impact.** Construction and operation of the project elements would not result in a substantial spill, release, or explosion of hazardous materials due to a terrorist action. Therefore, construction and operational impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore and Offshore; All Riser/Diffuser Areas.** An act of terrorism could initiate events described in this section such as hazardous materials release and/or explosion. Terrorism risk can be generally defined by the combined factors of threat, vulnerability, and consequence. In this context, terrorism risk represents the expected consequences of terrorist actions (i.e., spill, release, or explosion of hazardous materials) taking into account the likelihood that these actions will be attempted, and the likelihood that they will be successful. Of the three combined factors, the threat of a terrorist action cannot be directly affected by construction activities of the project elements because it is unknown whether actions will be attempted by terrorists. The vulnerability of the construction sites can be reduced by implementing security measures. The expected consequences of a terrorist action can also be affected by certain measures, such as emergency response preparations and action plans in the event of a spill, release, or explosion of hazardous materials.

Hazardous materials could be used during construction of the onshore and offshore tunnel and the riser and diffuser. The vulnerability of these hazardous materials to terrorist actions would be reduced through security measures required at the shaft sites and riser/diffuser areas. Access to the tunnels and riser would be highly restricted and controlled using regularly practiced tunneling construction security measures at the shaft sites. (See the discussion that follows for the specific security measures employed at the shaft sites.) The expected consequences of a terrorist action would be reduced through the implementation of the various jurisdictions emergency response plans (see Public Services Section XIV and Chapter 16 in the EIR/EIS) and through required construction and emergency response plans in the tunnel and at the riser and diffuser area (see Public Services Section XIV and Chapter 16 in the EIR/EIS). Therefore, construction of the onshore and offshore tunnels and the riser and diffuser would not result in a substantial release, spill, or explosion of hazardous materials due to a terrorist action. Construction impacts would not occur and will not be addressed in the EIR/EIS at the project level.

As discussed in HAZ-1 (Project), hazardous materials would not be handled, transported, or disposed of during project operation. Therefore, there would be no hazardous materials to upset and be released or spilled in the event of a terrorist action. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** See HAZ-5 (Project) for a discussion of terrorism risk and results of terrorist actions. Access to the tunnels and riser, as well as the shaft sites, would be highly restricted and controlled using regularly practiced tunneling construction security measures at the shaft sites. Specifically, a "tag-in-tag-out" security system is employed at all times, so the names and number of personnel in the tunnel are known. Therefore, no unauthorized personnel would be allowed to access the tunnels. These highly restrictive security measures would significantly reduce the vulnerability to a terrorist action by

preventing unauthorized access from the shaft sites to the tunnels and riser. Security and appropriate construction worker identification would be required and enforced at the construction site due to the inherent dangerous working conditions at the construction sites. This security and identification would significantly reduce the vulnerability of the construction sites to a terrorist action.

Construction and demolition activities for the project elements would involve the handling and use of certain amounts of hazardous materials, including vehicle fuels and other flammable chemicals as identified in HAZ-3 (Project). The potential consequence of a terrorist action on such activities would mainly concern relatively small potential targets such as construction vehicles and project elements undergoing construction. Fuel volume in any single piece of construction equipment is generally less than 50 gallons and fuel trucks are limited to 10,000 gallons or less. The enforcement of construction standards, including BMPs by appropriate local and state agencies (i.e., fire departments), would minimize the potential for a spill, release, or explosion of hazardous materials from construction equipment due to a terrorist action. Furthermore, the enforcement of these standards would reduce the impact should a spill, release, or explosion of hazardous material occur due to a terrorist action.

The types of hazardous materials (contaminated sediment and bentonite slurry) present at the shaft sites during construction are not highly flammable and would not result in an explosion. Furthermore, it is highly unlikely a terrorist action would release all of the contaminated sediment or bentonite slurry on site or being transported. Therefore, the amount released or spilled would be much less compared to the overall amount extracted. Any release or spill of these materials would be appropriately contained under normal containment and during cleanup actions after a hazardous materials release. Consequences associated with a terrorist attack during general construction would be low. Impacts related to the vulnerability of the project elements during construction, and consequences of having sensitive receptors on site during construction activities, would be low because the damage and general effect would be limited. Construction and operation of the project elements would not result in a substantial spill, release, or explosion of hazardous material(s) due to a terrorist action. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

As discussed in HAZ-1 (Project), hazardous materials would not be handled, transported, or disposed of during the operation at the shaft sites. Therefore, there would be no hazardous materials upset, released, or spilled in the event of a terrorist action. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HAZ-6. Overall Determination: No Impact.** Construction and operation of the project elements would not expose people or structures to wildfires. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** The project elements are not located in areas that would be subject to wildfires. The shaft sites are all located in developed and urbanized areas and would not be subject to a wildfire. The tunnel alignments would be located below the subsurface and would not be subject to a wildfire. The

riser would be located below the ocean floor and the diffuser at the ocean floor, and thus, they would not be subject to wildfires. Therefore, construction and operation of the project elements would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Hydrology, Water Quality (Freshwater), and Public Health Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **IX.** | **HYDROLOGY, WATER QUALITY (FRESHWATER), AND PUBLIC HEALTH.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| HYD -1. | Create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code (CWC) or cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| HYD -2. | Adversely change the level, rate, or direction of flow of groundwater? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| HYD -3. | Result in an increased level of groundwater contamination or affect the fate and transport of existing groundwater contamination (including that from direct percolation, injection, or salt water intrusion)? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| HYD -4. | Cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations (CCR), Title 22, Division 4, and Chapter 15 and in the Safe Drinking Water Act? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **IX.** | **HYDROLOGY, WATER QUALITY (FRESHWATER), AND PUBLIC HEALTH.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| HYD -5. | Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| HYD -6. | Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site? | ☐ | ☒ | ☐ | ☐ | ☒ | ☐ |
| HYD -7. | Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| HYD -8. | Result in demonstrable and sustained reduction of groundwater recharge capacity? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| HYD -9. | Place housing or other structures within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, or other flood hazard delineation map, which would impede or redirect flood flows? | ☐ | ☒ | ☐ | ☐ | ☒ | ☐ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **IX.** | **HYDROLOGY, WATER QUALITY (FRESHWATER), AND PUBLIC HEALTH.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| HYD -10. | Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |
| HYD -11. | Be subject to inundation by seiche, tsunami, or mudflow? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| HYD -12. | Substantially increase workers' or the public's actual or potential exposure to wastes or pathogens? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |

## Hydrology, Water Quality (Freshwater), and Public Health Program Discussion

Impacts on the San Gabriel River Tidal Prism are addressed in the EIR/EIS at the program level.

**HYD-1. Overall Determination: Potentially Significant Impact.** Construction and operation of program elements could create pollution, contamination, or a nuisance as defined by Section 13050 of the California Water Code. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** As discussed in GEO-5 (Program), construction of the conveyance improvements would involve trenching, cut, and fill. During construction, earth-moving activities could increase short-term erosion at the sites, resulting in stormwater runoff or erosion. This runoff could result in a violation of water quality standards. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

The improvements to the conveyance system could result in accepting more flow from industrial facilities in the JOS service area as discussed in HAZ-1 (Program). However, the conveyance system transports all wastewater to the WRPs, where the wastewater is treated to appropriate levels. Furthermore, each industrial facility within the JOS service area must comply with the National Pollutant Discharge Elimination System (NPDES) requirements for discharges into the conveyance system. The Sanitation Districts regularly monitor and test discharge water from industrial facilities to ensure compliance with permitted amounts of discharged constituents. Therefore, operation of the conveyance improvements would not create pollution, contamination, or a nuisance, and operating the expansion and upgrades to the conveyance system would result in a less than significant impact and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See HYD-1 (Program), Conveyance System, for a discussion of construction impacts, which would also apply to the construction of the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once operational, plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would result in no impacts. The majority of the process optimization facilities would be buried underground and the surface would be restored to previous existing conditions. The expansion of the SJCWRP would use existing treatment technologies to treat wastewater to a tertiary level and then release it using existing discharge points into existing receiving waters. The expansion would require an increase in the permitted capacity of the plant from 100 MGD to 125 MGD. The increase in permitted capacity would require the Sanitation Districts to apply for a new wastewater permit from the Los Angeles RWQCB. This permit would ensure that the wastewater treatment requirements for the SJCWRP are met. Therefore, operational impacts would be less than significant for expansion at SJCWRP and process optimization and will not be addressed in the EIR/EIS at the program level.

Under operating conditions, WRP effluent management could lead to a reduction in effluent released to receiving waters. This reduction could cause a change in the water quality of the receiving waters. Therefore, operational impacts on water quality associated with WRP effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP would be potentially significant and will be addressed in the EIR/EIS at the program level. In addition, the San Gabriel River Tidal Prism has the potential to be impacted by WRP effluent management. WRP effluent management at the POWRP, WNWRP, and SJCWRP (discharge locations at the confluence of San Jose Creek and the San Gabriel River) would not have an impact on the San Gabriel River Tidal Prism because discharge locations are all located above the spreading grounds. The treated effluent discharged into the receiving waters above the spreading grounds stays primarily within the spreading grounds and infiltrates into the ground. However, WRPs with discharge locations below the spreading grounds would result in potentially significant impacts on the tidal prism, and the SJCWRP (for the discharge location downstream of the spreading grounds), LCWRP, and LBWRP will be addressed in the EIR/EIS at the program level.

**JWPCP.** See HYD-1 (Program), Conveyance System, for a discussion of construction impacts, which would also apply to the construction of the solids processing digesters. Construction-related impacts on water quality associated with solids processing would be potentially significant and will be addressed in the EIR/EIS at the program level. Once operational, the solids processing digesters would be completely self-contained and would process solids for appropriate disposal or beneficial use. Therefore, operation of the solids processing facilities would not create pollution, contamination, or a nuisance, and impacts would not occur. Operational impacts on water quality associated with solids processing will not be addressed in the EIR/EIS at the program level.

Operation of biosolids management would increase composting, land application, and activities at landfills within the JOS service area and areas outside the JOS service area. The EPA regulates biosolids through 40 CFR Part 503. The standards are applicable to land application, surface disposal, and incineration. For disposal in a municipal solid waste landfill, the biosolids must meet standards from 40 CFR Part 258. Biosolids generated at the JWPCP do meet EPA Class B pathogen reduction requirements provided in the EPA's Alternative 2, Use of Processes to Significantly Reduce Pathogens, through time and temperature requirements for anaerobic digestion. Vector attraction reduction requirements are met by reducing the mass of volatile solids during anaerobic digestion. JWPCP biosolids are sampled monthly and analyzed for total metals concentrations. Since the 1993 promulgation of the federal rules governing biosolids management, the JWPCP biosolids have consistently complied with the most stringent requirements related to metals concentrations. The land application and beneficial use locations are generally located in areas dominated by agriculture or industrial/commercial areas. The actual land application or beneficial use would occur on existing agricultural land or in existing beneficial use buildings. The Sanitation Districts would only use sites that are properly permitted and for which all site-specific impacts, including the potential to create water pollution, water contamination, or a nuisance, have been mitigated thoroughly through either preparation of site-specific environmental documents or compliance with other federal, state, and local regulations. Therefore, operation of biosolids management would result in impacts that are less than significant to water quality and will not be addressed in the EIR/EIS at the program level.

**HYD-2. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not adversely change the level, rate, or direction of flow of groundwater. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction and operation of the conveyance improvements generally would not require the extraction of groundwater and, therefore, would not change the existing levels of groundwater within the JOS service area. Furthermore, it would not require a change in existing impervious surface areas (i.e., concrete roads) within the JOS service area and, therefore, would not change the rate of groundwater recharge in the service area. Finally, it would generally be located in areas with existing utilities and, therefore, would not substantially interfere with the downward flow of groundwater. Therefore, it would not adversely change the level, rate, or direction of flow of groundwater. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction and operation for plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not adversely change the level, rate, or direction of flow of groundwater. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

The operation of WRP effluent management involves changing rates of reuse and discharge from each WRP, which could alter groundwater level, rate, or direction of flow. However, the state has requirements that cap the amount of recycled water that can be recharged as groundwater (Central Basin Municipal Water District 2005), and these caps would not be exceeded under the program[1]. Therefore, impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction and operation of the solids processing digesters would occur within the existing footprint of the JWPCP. Construction and operation would occur above the groundwater table and thus would not require dewatering that could lead to flooding. Geologic testing conducted in 2010 encountered groundwater between 43 and 62 feet bgs (Sanitation Districts 2010). A previous investigation at the JWPCP did conclude, however, that zones of near saturation occur at 5 to 10 feet bgs (Geo Logic Associates 1995:14). Therefore, construction and operation of the solids processing digesters (approximately 30 feet bgs) would not adversely change the level, rate, or direction of flow of groundwater. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

See Hyd-1 (Program) for a discussion of biosolids management operations applicable to this threshold. The land application of biosolids or the beneficial use of biosolids in an existing facility would not adversely change the level, rate, or direction of flow of groundwater. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the program level.

[1] Groundwater recharge with recycled water is limited to 50,000 acre-feet per year or a maximum of 150,000 acre-feet over 3 years (Central Basin Urban Water Management Plan 2005).

**HYD-3. Overall Determination: Potentially Significant Impact.** Construction of all program elements and operation of WRP effluent management could result in an increased level of groundwater contamination or affect the fate and transport of existing groundwater contaminants. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Conveyance improvements could result in groundwater contamination due to release of contaminants such as fuels or lubricants during conveyance construction activities. Therefore, construction impacts on groundwater contamination associated with the conveyance system would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once operational, the conveyance system would be buried underground and would be self-contained. The entire system is regularly maintained and examined for leaks and structure failure. It would be highly unlikely for the conveyance system to leak such that it would release untreated wastewater into the subsurface and contaminate groundwater. Therefore, operation of the conveyance improvements would not have the ability to increase groundwater contamination or affect the fate and transport of existing groundwater contamination. Operational impacts of the conveyance system would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Depths to groundwater at the WRPs range from 3 feet to 30 feet bgs. Construction associated with process optimization would include excavation to approximately 30 feet bgs, and groundwater has the potential to seep into the excavated areas at all sites. Construction of process optimization would contact groundwater, and could lead to groundwater contamination. Therefore, construction impacts associated with plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would be potentially significant and will be addressed in the EIR/EIS at the program level. The discussion for HYD-1 (Program) regarding the operation of the conveyance system is applicable to the operation of the expansion at SJCWRP and process optimization at SJWRP, POWRP, LCWRP, and LBWRP. Operations would result in less than significant impacts on groundwater contamination will not be addressed in the EIR/EIS at the program level.

Operation of WRP effluent management could result in an increase or decrease in the volume of tertiary treated effluent discharged from the WRPs. Recycled water used for groundwater recharge must comply with water reclamation requirement limits and a rigorous monitoring program in accordance with RWQCB requirements. However, operational impacts associated with WRP effluent management would be potentially significant, and this issue will be addressed in the EIR/EIS at the program level. In addition, the San Gabriel River Tidal Prism has the potential to be impacted by WRP effluent management as discussed in HYD-1 (Program). WRPs with discharge locations downstream of the spreading grounds would result in potentially significant impacts on the tidal prism. These include the SJCWRP (discharge location downstream of the spreading grounds), LCWRP, and LBWRP and, therefore, will be addressed in the EIR/EIS at the program level.

**JWPCP.** See HYD-1 (Program) and HYD-3 (Program) for details on construction and construction spills for the conveyance system that are applicable to the construction of the solids processing digesters at the JWPCP. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at

the program level. See HYD-1 (Program) and HYD-3 (Program) for details on operation of the conveyance system that are applicable to the operation the solids processing digesters at the JWPCP. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

There would be an increase in the quantity of biosolids that must be managed by the Sanitation Districts. This would increase composting, land application, and activities at landfills within the JOS service area and areas outside the JOS service area. The actual land application or beneficial use would occur on existing agricultural land or in existing beneficial use buildings. The Sanitation Districts will only use sites that are properly permitted and for which all site-specific impacts, including the potential for impacting groundwater, have been mitigated thoroughly through either preparation of site-specific environmental documents or compliance with other federal, state, and local regulations. Therefore, the increase in biosolids at the JWPCP would not result in increased levels of groundwater contamination at the existing beneficial use sites or landfills. Operational impacts of biosolids would not occur and will not be addressed in the EIR/EIS at the program level.

**HYD-4. Overall Determination: Potentially Significant Impact.** Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level. Operation of WRP effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP could significantly impact production wells. Therefore, operational impacts related to WRP effluent management at the WRPs would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The producing potable water aquifers range from depths of 1,000 feet to 2,000 feet in the JOS service area (MWD 2007). In shallower areas, many of the aquifers are confined by thick aquitards (sediments that allow very limited groundwater migration) and are protected from surface contamination (MWD 2007). The production wells in the JOS service area draw from deep aquifers specifically to avoid contamination that is located closer to the surface. Construction of the conveyance improvements would occur within the public rights-of-way of existing streets at depths less than 30 feet bgs. Construction would not cause regulatory standards in existing production wells to be violated due to the depth of the production wells and the depth of the location of the conveyance system construction. Operation of the conveyance system would occur in a self-contained system, as it currently does. It would not cause regulatory standards in existing production wells to be violated. Therefore, construction and operation of the conveyance improvements would not cause regulatory water quality standards at an existing production well to be violated. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See HYD-4 (Program) for details regarding conveyance system construction and operation that are applicable to the construction and operation of the expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP. Construction and operational impacts on existing production wells would not occur and will not be addressed in the EIR/EIS at the program level.

Because portions of the Rio Hondo, San Jose Creek, and San Gabriel River are unlined, a change in the volume of tertiary treated effluent discharged from the SJCWRP, POWRP, or WNWRP could result in a change of water quality in a production well. Therefore, operation of WRP effluent management at the

SJCWRP, POWPR, and WNWRP would be potentially significant and will be addressed in the EIR/EIS at the program level. Additionally, discharges from the LCWRP and LBWRP are released to Los Coyotes Creek and the San Gabriel River, and flow into the San Gabriel River Tidal Prism. A change in volume of treated effluent discharged from locations downstream of the spreading grounds from the SJCWRP, LCWRP, and LBWRP could alter the volume of freshwater flows that enter the tidal prism, potentially resulting in increased salinity within the tidal prism and a resultant increase in saltwater intrusion within connected aquifers. Impacts would be potentially significant; therefore operation of WRP effluent management at the SJCWRP, LCWRP, and LBWRP will be addressed in the EIR/EIS at the program level.

**JWPCP.** See HYD-4 (Program) for details regarding construction and operation of the conveyance system that are applicable to the construction and operation of the solids processing digesters at the JWPCP. See HYD-1 (Program) for details regarding operation of biosolids management that would be applicable to this threshold. Construction and operation of solids processing facilities and operation of biosolids management would not violate regulatory water quality standards at an existing production well. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**HYD-5. Overall Determination: Potentially Significant Impact.** Construction of all program elements and operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could substantially alter the existing drainage pattern of the site or area. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See HYD-1 (Program) for details regarding conveyance construction impacts, which are applicable to this threshold. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once operational, the conveyance system would convey wastewater to the WRPs or JWPCP for treatment. The conveyance system would be buried underground and the surface conditions would be returned to their existing conditions (i.e., concrete, pavement, and curbs and gutters found normally along the public rights-of-way of existing streets). Therefore, operation of the conveyance improvements would not substantially alter the existing drainage pattern of the site or area; impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See HYD-1 (Program) for details regarding WRP construction impacts, which are applicable to this threshold. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

The WRPs are fully developed and have completely developed drainage systems to collect stormwater as well as discharge tertiary treated effluent from the WRPs into receiving waters. Plant expansion at the SJCWRP would result in new treatment facilities located adjacent to the existing facilities in an area of maintained lawn and concrete. The operation of these facilities would not substantially alter the existing drainage pattern of the site or area. The impervious area generated by the new facilities would tie into the existing stormwater drainage system on site. Under operating conditions, process optimization facilities

at the SJCWRP, POWRP, LCWRP, and LBWRP would be buried underground, and surface conditions would be returned to their existing conditions, which include parking lots and maintained lawn areas for the SJCWRP, asphalt and disturbed soil for the POWRP, a driving range for the LCWRP, and a disturbed soil and ruderal vegetation area for the LBWRP. Therefore, the operation of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not result in an alteration of drainage at the WRPs that would result in substantial erosion or siltation on or off site. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

The operation of WRP effluent management at the SJCWRP, POWRP, and WNWRP could alter the existing drainage pattern of unlined receiving waters due to a change in volume. Therefore, operations of WRP effluent management at the SJCWRP, POWRP, and WNWRP would be potentially significant and will be addressed in the EIR/EIS at the program level.

During operation of WRP effluent management, the LBWRP and LCWRP would continue to discharge tertiary treated effluent into concrete-lined receiving waters; there would be no erosion due to the concrete lining of the channel. Therefore, operation of WRP effluent management at the LBWRP and LCWRP would not result in impacts and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See HYD-1 (Program) for details regarding JWPCP construction impacts, which are applicable to this threshold. Construction impacts of the solids processing digesters would be potentially significant and will be addressed in the EIR/EIS at the program level.

The JWPCP is a fully developed site with an extensive stormwater drainage system used to collect all stormwater runoff generated by the impervious surfaces on site. There are no natural features adjacent to the area where the solids processing digesters would operate. Therefore, the operation of the solids processing digesters would not substantially alter the existing drainage pattern of the site or area. Operational impacts of solids processing would not occur and will not be addressed in the EIR/EIS at the program level.

Biosolids would be beneficially used or landfilled at existing sites designed to receive biosolids. Therefore, the increase in biosolids at the JWPCP would not result in alteration of existing drainage patterns at the receiving beneficial use sites or landfills that would cause substantial erosion or siltation. Operational impacts as a result of biosolids management would not occur and will not be addressed in the EIR/EIS at the program level.

**HYD-6. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not substantially alter the existing drainage pattern of the site or area or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site. Therefore, construction and operational impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction of the conveyance improvements would result in trenching and soil excavation. This would result in an alteration to the existing drainage pattern of a site. However, the construction of the improvements to the conveyance system would be temporary, and the site would be

returned to its existing conditions with the completion of construction. Therefore, construction of the conveyance improvements would not substantially alter the existing drainage pattern of a site that would result in onsite or offsite flooding. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Once operational, the conveyance system would convey wastewater to the WRPs or JWPCP for treatment. The conveyance system would be buried underground and self-contained. Surface conditions would be returned to their existing conditions (i.e., concrete, pavement, and curbs and gutters found normally along the public rights-of-way of existing streets). Therefore, operation of the conveyance improvements would not substantially alter existing drainage patterns resulting in flooding on site or off site. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would occur within the existing footprint of each of the WRPs. Generally, the existing footprint of the WRPs consists of impervious surfaces with an existing stormwater drainage system. Construction would alter the drainage pattern of the WRPs; however, development would contribute only a minor addition to existing impervious surfaces. Furthermore, none of the WRPs are located within a 100-year flood zone as discussed in HYD-9 (Program). Therefore, although construction could modify the existing drainage patterns of the WRPs, it would not result in flooding on site or off site. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

The WRPs are fully developed and have completely developed drainage systems to collect stormwater as well as discharge tertiary treated effluent from the WRPs into receiving waters. The operation of plant expansion facilities at the SJCWRP would not substantially alter the existing drainage pattern of the site or area. The impervious area created by these facilities would tie into the existing stormwater drainage system on site. Under operating conditions, the majority of the process optimization facilities at the SJCWRP, POWRP, LCWRP, and LBWRP would be buried underground and the surface would be returned to previous existing conditions, which include parking lots and maintained lawn areas for the SJCWRP, asphalt and disturbed soil for the POWRP, a driving range for the LCWRP, and a disturbed soil and ruderal vegetation area for the LBWRP. Therefore, the operation of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not cause an alteration of drainage at the WRPs that would result in substantial flooding on site or off site. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Under effluent management operations, the volume of tertiary treated effluent discharged from the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP could increase or decrease depending on future reuse demand. Although there could be an increase in the volume of tertiary treated effluent discharged from the WRPs, this discharge would not flow into the stormwater drainage system, but would be directly discharged into receiving waters. These receiving waters are specifically maintained for flood and drainage purposes during wet and dry flows and would be able to accommodate any increase in treated effluent discharged from the WRPs. Therefore, operation of the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP would not create or contribute runoff that would alter the existing drainage pattern of a site in a manner that would result in flooding on site or off site. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction of the solids processing digesters would occur within the existing footprint of the JWPCP. Generally, the existing footprint of the JWPCP consists of impervious surfaces with an existing stormwater drainage system. Construction would alter the drainage pattern; however, development would contribute only a minor addition to existing impervious surfaces. Furthermore, the JWPCP is not located

within a 100-year flood zone as discussed in HYD-9 (Program). Therefore, although construction would modify the existing drainage patterns of the JWPCP, it would not result in flooding on site or off site. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

The JWPCP is a fully developed site with an extensive stormwater drainage system that collects all stormwater runoff generated by the impervious surfaces on site. The solids processing digesters would be self-contained and would be connected to the existing treatment systems at the JWPCP. Therefore, the operation of the solids processing digesters would not substantially alter the existing drainage so that flooding would occur on or off site. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

See HYD-1 (Program) for a discussion of biosolids management operations applicable to this threshold. The existing drainage pattern of the biosolids beneficial use sites or landfills would not be substantially altered and, therefore, impacts would not occur. Impacts will not be addressed in the EIR/EIS at the program level.

**HYD-7. Overall Determination: Potentially Significant Impact.** Construction of all program elements (except solids processing and biosolids management) could create or contribute runoff water that could provide additional sources of pollutants or exceed the capacity of existing or planned stormwater drainage systems as discussed below. Therefore, construction impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See HYD-1 (Program) for details regarding conveyance system construction impacts, which are applicable to this threshold. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once operational the conveyance system would convey wastewater to the WRPs or JWPCP for treatment. The conveyance system would be buried underground and the system would be self-contained. Surface conditions would be returned to their existing conditions (i.e., concrete, pavement, and curbs and gutters found normally along the public rights-of-way of existing streets). Therefore, operation of the conveyance improvements would not create runoff water or provide substantial additional sources of polluted runoff. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** See HYD-1 (Program) for details regarding WRP construction impacts, which are applicable to this threshold. Construction impacts associated with plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would be potentially significant and will be addressed in the EIR/EIS at the program level.

Operation of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not result in substantial runoff that would exceed the capacity of storm drains or generate polluted runoff. The WRPs are fully developed and have drainage systems to collect stormwater as well as discharge tertiary treated effluent from the WRPs into receiving waters. Plant expansion at the SJCWRP would result in new treatment facilities. The operation of these facilities

would not substantially alter the existing drainage pattern of the site or area. The impervious area generated by the new facilities would tie into the existing stormwater drainage system on site. Under operating conditions, process optimization would be buried underground and the surface would be returned to previous existing conditions. Therefore, the operation of the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not result in polluted runoff. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Under effluent management operations, the volume of tertiary treated effluent discharged from the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP could increase or decrease. The effluent would continue to be tertiary treated and regulated by the RWQCB via the Clean Water Act and other state regulations. Therefore, the effluent would not introduce any new pollutants into the receiving waters. Therefore, WRP effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP would not generate additional sources of polluted runoff. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** See HYD-1 (Program) for details regarding JWPCP construction impacts, which are applicable to this threshold for the construction of the solids processing digesters. Construction impacts of the solids processing digesters would be potentially significant and will be addressed in the EIR/EIS at the program level.

The JWPCP is a fully developed site with an extensive stormwater drainage system used to collect all stormwater runoff generated by the impervious surfaces on site. There are no natural features adjacent to the area where the solids processing digesters would operate. The solids processing digesters would be self-contained and would be connected to the existing treatment systems at the JWPCP. Therefore, the operation of the solids processing digesters would not create or contribute to runoff that would exceed the drainage system or provide substantial sources of polluted runoff. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

See HYD-1 (Program) for details regarding biosolids management operational impacts, which are applicable to this threshold. Operational impacts of biosolids management would not occur and will not be addressed in the EIR/EIS at the program level.

**HYD-8. Overall Determination: No Impact.** Construction and operation of all program elements would not result in demonstrable and sustained reduction of groundwater recharge capacity. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Groundwater recharge capacity refers to the capacity of an aquifer area to refill or recharge a potable groundwater aquifer and whether that refill capacity would be diminished (through reductions in soil permeability, surface area, or other effects). Construction and operation of the conveyance improvements could occur at or below the groundwater table. Throughout most of the subbasin, the near surface Bellflower aquiclude restricts vertical percolation into the underlying aquifers, and creates local semi-perched groundwater conditions. Groundwater enters the basin through surface

and subsurface flows and by direct percolation of precipitation, stream flow, and applied water. The aquifers are replenished predominantly within the forebay areas where permeable sediments are exposed at ground surface (DWR 2003). Most of the aquifers in the Los Angeles Basin that store recharge water are at depths much greater than 20 feet bgs. Construction would follow standard engineering and construction practices currently used by the Sanitation Districts to maintain their conveyance system. Trenching at the surface and up to 20 feet bgs would have no impact on groundwater. Deeper construction could puncture this aquiclude and cause it to drain to lower aquifers; however, the typical depths of conveyance system construction would not cause this to occur and, therefore, would not cause subsidence in the aquifer(s) in the JOS service area. Therefore, construction and operation of the conveyance improvements would not cause subsidence of soil and would not result in a reduction of groundwater recharge capacity. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction and operation of plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not cause subsidence of soil and would, therefore, not result in a reduction of groundwater recharge capacity. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Under WRP effluent management operations, the volume of tertiary treated effluent discharged from the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP could increase or decrease depending on future reuse demand. Effluent would continue to be used for groundwater recharge at the spreading grounds and effluent management would not reduce the basin's recharge capacity. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction and operation of the solids processing digesters at the JWPCP would not cause subsidence of soil and would, therefore, not result in a reduction of groundwater recharge capacity. The additional biosolids digesters are expected to cover a relatively small area of the JWPCP, and they would be constructed in an area of impervious surfaces at the plant. Therefore, construction and operation of the digesters would not reduce groundwater recharge capacity and will not be addressed in the EIR/EIS at the program level.

Biosolids would be beneficially used or land filled at existing sites designed to receive biosolids. Therefore, the increase in biosolids at the JWPCP or at offsite locations would not add impervious surfaces that could reduce groundwater recharge capacity at the receiving beneficial use sites or landfills. Operational impacts of biosolids would not occur and will not be addressed in the EIR/EIS at the program level.

**HYD-9. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not place housing or other structures within a 100-year floodplain, which would impede or redirect flood flows. Therefore, impacts would be less than significant and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Although it is unknown where the improvements to the conveyance system would occur, it is likely that most of the improvements would occur outside the designated 100-year floodplain,

which would remove them from flooding hazards. However, should construction occur within a 100-year flood zone, the construction equipment, which would consist of typical backhoes, jackhammers, and bulldozers, would not impede or redirect flood flows. Furthermore, the construction would be temporary and once it is completed, it generally would not result in an aboveground structure(s). Therefore, construction impacts would be less than significant and operational impacts would not occur. Construction and operational impacts will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** Construction and operation of program elements at the WRPs and JWPCP would not place housing or other structures within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, which would impede or redirect flood flows. All of the program facilities are located outside the 100-year flood hazard area. Therefore, impacts would not occur, and this issue will not be addressed in the EIR/EIS at the program level.

**HYD-10. Overall Determination: Less Than Significant Impact.** Construction and operation of program elements would not expose people or structures to a significant risk involving flooding including flooding as a result of the failure of a levee or dam. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System and JWPCP.** Construction and operation of the conveyance improvements and solids processing and biosolids management would not increase the number of people working at the JWPCP. Furthermore, the conveyance system would be underground during operating conditions. Therefore, these program elements would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Therefore, construction and operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** The closest dam upstream of a program facility is Santa Fe Dam, located 6.3 miles upstream of the SJCWRP. If the dam were to fail, there would be ample time for evacuation during construction at this facility. Furthermore, during operations, plant expansion at the SJCWRP and process optimization at SJCWRP would not require an increase in the number of people currently working at the WRP. Therefore, construction and operational impacts associated with the SJCWRP would be less than significant and will not be addressed in the EIR/EIS at the program level.

**HYD-11. Overall Determination: Potentially Significant Impact.** Construction and operation of the POWRP could be subject to inundation by a mudflow. Therefore, construction and operational impacts related to this specific program element would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System and JWPCP.** As discussed under GEO-1 (Program), improvements to the conveyance system, solids processing at the JWPCP, and biosolids management at the JWPCP and elsewhere in the state of California typically would be located in flat areas that would not support mudflows. Furthermore, the JWPCP is not located in an area designated as a landslide area (California Department of Conservation 1999e). Finally, these program facilities would be located inland (over 5 miles away from the coast) with numerous intervening structures related to the urban environment (buildings, freeways, etc.) that they would not be subject to inundation through a tsunami or seiche. Therefore, construction and operation of the improvements to the conveyance system and at the JWPCP would not be subject to inundation by seiche, tsunami, or mudflow. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** As discussed in GEO-1 (Program), the plant expansion at the SJCWRP and process optimization at the SJCWRP, LCWRP, and LBWRP typically would be located in flat areas, within the footprint of the existing WRPs, in areas that would not support a mudflow. Furthermore, these facilities are located sufficiently inland (over 5 miles away from the coast) with many intervening urban structures that they would not be subject to inundation through a tsunami or seiche. Therefore, construction and operation at these three WRPs would not be subject to inundation by seiche, tsunami, or mudflow and will not be addressed in the EIR/EIS at the program level. However, the POWRP is located adjacent to an identified landslide area; therefore, during construction, it could be subject to a mudflow. Therefore, construction and operational impacts would be potentially significant for process optimization at the POWRP and will be addressed in the EIR/EIS at the program level.

**HYD-12. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not substantially increase workers' or the public's actual or potential exposure to wastes or pathogens. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Construction and operation of all program elements would not substantially increase workers' or the public's actual or potential exposure to wastes or pathogens. The Sanitation Districts would continue to comply with all California Division of Occupational Safety and Health (Cal/OSHA) requirements for worker safety. Worker exposure to wastes or pathogens would be minimized because the Sanitation Districts would continue to comply with water quality standards for adequate disinfection. Furthermore, none of the program elements result in an increase in the number of employees at the various facilities over existing conditions; therefore, operation of the program would not expose new employees to pathogens.

The effluent discharged into receiving waters or used as reclaimed water throughout Southern California is tertiary treated effluent that conforms with all RWQCB and California Department of Public Health standards.

Biosolids management at the JWPCP includes an increase in biosolids; however, biosolids would continue to be processed and transported according to EPA standards. Furthermore, the actual land application or beneficial use would occur on existing agricultural land or in existing beneficial use buildings. The Sanitation Districts would only use sites that are properly permitted and for which all

site-specific impacts, including the potential for affecting riparian areas and sensitive natural communities, have been mitigated thoroughly through either preparation of site-specific environmental documents or compliance with other federal, state, and local regulations. Therefore, construction and operational impacts would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

## Hydrology, Water Quality (Freshwater), and Public Health Project Discussion

**HYD-1. Overall Determination: Potentially Significant Impact.** Construction at all shaft sites could create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code (CWC) or cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or water quality control plan for the receiving water body. Therefore, construction impacts for these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore.** The tunneling construction method determines the volume of water that could be generated within the tunnel. The tunnel would be watertight because of use of a TBM. Equal pressure between the cutting face of the TBM and the soil would be maintained to retain the integrity of the tunnel as it is drilled and to prevent collapse. Minimal leakage of groundwater into the excavation would occur because the soil interface is isolated within the pressurized cutting face. Therefore, minimal volumes of water would need to be removed through dewatering during tunnel construction. However, any water generated by tunnel construction would be collected at the working shaft site and diverted to the sewer for treatment by either the Sanitation Districts at the JWPCP or the City of Los Angeles at the Terminal Island Water Reclamation Plant. Water generated during tunnel construction would not be released directly into receiving waters. Therefore, onshore and offshore tunnel construction would not create pollution, contamination, or nuisance. Construction impacts would be less than significant, and will not be addressed in the EIR/EIS at the project level.

Once the onshore and offshore tunnels are operational, they would be self-contained and would convey secondary treated effluent from the JWPCP to the Pacific Ocean. This conveyance would not result in water pollution, contamination, or a nuisance. Therefore, operational impacts would not occur, and this issue will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Construction at all shaft sites could result in water quality impacts through the generation of nuisance water during the shaft construction process or the handling of large amounts of excavated soil. The earth-moving and excavation activities could increase short-term erosion at the sites, which could result in a violation of water quality standards. Therefore, construction impacts associated with any shaft site would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the shaft sites would consist of self-contained, underground facilities. There could also be some low-profile, aboveground facilities. Operational impacts would not exist and will not be addressed in the EIR/EIS at the project level.

**HYD-2. Overall Determination: Potentially Significant Impact.** Construction and operation of several project elements could adversely change the level, rate, or direction of flow of groundwater as the tunneling occurs. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore.** As discussed under Impact HYD-1 (Project), the onshore and offshore tunnel construction method would cause the tunnel to be watertight. Some water, however, typically enters the excavation by entrainment in cuttings. The water volumes are low, so there is little potential to affect groundwater flow direction during tunneling. Furthermore, the tunnel diameter is small (approximately 22 foot external diameter) relative to the thickness of the sediments through which it is constructed. Therefore, groundwater would flow above and below the tunnel during both construction and operations, and there would be no substantial change in flow rate. Therefore, construction and operational impacts on groundwater flow volume, rate, and direction for the onshore and offshore tunnel would be less than significant and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Construction and operations at the shaft sites could result in a change in the direction, rate, or flow of groundwater. Therefore, impacts associated with all the shaft sites would be potentially significant and will be addressed in the EIR/EIS at the project level.

**HYD-3. Overall Determination: Potentially Significant Impact.** Construction of several project elements could result in an increased level of groundwater contamination through salt water intrusion, or affect the fate and transport of existing groundwater contaminants. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore.** The onshore tunnel has the potential to result in an increased level of groundwater contamination (including that from percolation, injection, or salt water intrusion). There are salt water intrusion barriers along the coast of southern California, such as the Dominguez Gap seawater barrier. These barriers are comprised of wells that inject freshwater into the subsurface to maintain a barrier and prevent salt water from intruding into the fresh groundwater aquifers. Although these barriers would not directly conflict with the onshore tunnel alignments, if the TBM passes within proximity of the barriers, the operation of the injection well(s) may need to be temporarily suspended. Therefore, construction impacts along the onshore tunnel alignment would be potentially significant, and this issue will be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for a discussion of operational impacts of the onshore tunnel applicable to this threshold. Operation of any onshore tunnel would not result in an increased level of groundwater contamination, and no impacts would occur. Operational impacts will not be addressed in the EIR/EIS at the project level.

**Tunnel Alignments – Offshore**. Construction of the offshore tunnel would not affect the fate of existing groundwater contamination and would not result in an increased level of groundwater contamination. There is no known existing groundwater contamination at the depths the offshore alignments would be constructed; therefore, the fate of existing contamination cannot be affected and an increase above existing levels cannot occur. Because the tunnel would be installed behind the cutter head and each segment would be sealed to the earlier segment with a neoprene gasket, groundwater would be prevented from freely flowing into the tunnel. The tunnel itself would contain very few hazardous materials during construction, thereby minimizing the potential for spills and releases. If any hazardous materials were released during tunneling, it would be physically impossible for them to leach into the groundwater because they would be moving against the pressure gradient created by the tunnel. Therefore, construction of the offshore tunnel would not result in an increased level of groundwater contamination. Impacts would not occur and will not be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for a discussion of operational impacts of the offshore tunnel applicable to this threshold. Operation of the offshore tunnel would not result in an increased level of groundwater contamination, and no impacts would occur. Operational impacts will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Groundwater contamination could occur in association with spills within the shaft excavation or on the ground surface in the construction area. Shaft construction also has the potential to affect existing groundwater contamination, primarily by affecting the direction and rate of groundwater flow via construction and any associated dewatering activities. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for a discussion of operational impacts of the shaft sites applicable to this threshold. Under operating conditions, the shaft sites would consist of a self-contained, belowground access structure that would not have the ability to influence existing groundwater contamination or increase groundwater contamination above existing levels. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HYD-4. Overall Determination: Potentially Significant Impact.** Construction of the onshore tunnel, and at the JWPCP East and JWPCP West shaft sites, could violate regulatory water quality standards in an existing production well. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | N/A | N/A |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | N/A | N/A |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | N/A |

**Tunnel Alignments – Onshore.** There are several production wells located near the JWPCP that are identified in the JWPCP Tunnel and Ocean Outfall Feasibility Report (Parsons 2011). These wells could be located near the path of the onshore tunnel alignments. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for a discussion of operational impacts of the onshore tunnels applicable to this threshold. Operation of any onshore tunnel would not cause regulatory standards in an existing production well to be violated, and no impacts would occur. Therefore, operational impacts will not be addressed in the EIR/EIS at the project level.

**Tunnel Alignments – Offshore.** There are no potable wells located offshore. Therefore, construction and operation of any offshore tunnel would not have an impact on water quality standards in potable wells and will not be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for a discussion of operational impacts of the offshore tunnels applicable to this threshold. Operation of any offshore tunnel would not cause regulatory standards in an existing production well to be violated, and no impacts would occur. Impacts will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East and JWPCP West.** See HYD-4 (Project) for details regarding potable wells within the vicinity of the JWPCP. Construction at the JWPCP East shaft site or JWPCP West shaft site could cause regulatory water quality standards to be violated at these existing wells. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

See HYD-1(Project) for a discussion of operational impacts of the JWPCP East and JWPCP West shaft sites applicable to this threshold. Operation at these two shaft sites would not cause regulatory standards in an existing production well to be violated and no impacts would occur. Impacts will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – TraPac, LAXT, Southwest Marine, Angels Gate, and Royal Palms**. These shaft sites are located on the ocean side of the saltwater intrusion barriers that exist in the Los Angeles region. There are no potable wells located on the ocean side of the salt water intrusion barrier; therefore, construction and operation of these wells would not result in water quality violations of a potable well because none exist within the vicinity of the shaft sites. Impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** There are no potable wells in the ocean. Construction and operation of the riser and diffuser would not be applicable to production well thresholds and, therefore, are not discussed in this section or in the Marine Environment Section XI.

**HYD-5. Overall Determination: Potentially Significant Impact.** Construction at all shaft sites could substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation on site or off site. Therefore, construction impacts related to these specific project elements would be potentially significant and will be included in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore**. Similar to the air quality impacts, water quality impacts associated with tunneling the onshore and offshore alignments would not actually occur within the tunnel, but rather at the shaft sites, as discussed in HYD-1 (Project). Therefore, impacts associated with any excavated material and any water generated during tunneling are discussed under shaft sites. Construction and operational impacts associated with the tunnel alignments would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** See HYD-1(Project) for details regarding the construction at the shaft sites. Construction at any shaft site could substantially alter the existing drainage patterns of the site that could result in substantial erosion or siltation on site or off site. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

See HYD-1(Project) for details regarding the operation at the shaft sites that are applicable to this threshold. Operation at the shaft sites would not substantially alter the existing drainage pattern of the sites and would not cause erosion or siltation on site or off site. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HYD-6. Overall Determination: Less Than Significant Impact.** Construction and operation of project elements would not substantially alter the existing drainage pattern of the site or area or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore**. Construction and operation of the onshore and offshore tunnels would be located below the ground surface and below the seafloor. There is no drainage pattern in the subsurface and, therefore, tunneling would not alter the drainage pattern to cause flooding. See the analysis below regarding any nuisance water generated during tunneling at the shaft sites. Therefore, construction and operation would not result in flooding on site or off site. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** As stated in the Feasibility Report (Parsons 2011), groundwater infiltration through the temporary shaft walls in the soft ground should be less than 10 gallons per minute (GPM) with no more than 0.5 GPM from any 1 square foot of wall. Permanent inflows should be 0 GPM as the walls are expected to be water tight. Once shaft site walls are shored up with concrete, any water continues to flow down on the outside of the shaft site wall, eliminating the potential to significantly alter drainage at the surface or to significantly alter the rate of runoff at the surface. The diameter of the shaft sites (approximately 25 to 60 feet) is relatively small compared to the existing environment and thus, the shaft site itself does not add much impervious surface such that drainage patterns would be significantly altered. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for a discussion of operational impacts of the shaft sites applicable to this threshold. Operation at any shaft site would not result in a substantial change to the existing drainage pattern of a site, resulting in flooding on site or off site, and impacts would not occur. Operational impacts will not be addressed in the EIR/EIS at the project level.

**HYD-7. Overall Determination: Potentially Significant Impact.** Construction at all shaft sites could create or contribute to runoff water which could then exceed the capacity of the existing stormwater drainage system. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore**. As discussed previously in HYD-1 (Project), tunnel boring of the onshore and offshore tunnel has the potential to create some water during tunneling. Dewatering volumes are minimized during tunnel construction because of the construction technique. As tunnel construction proceeds, the watertight tunnel is constructed in place. Water can only enter the excavation at the cutting head of the TBM. This area is isolated within the pressurized cutting face, and experiences minimal leakage. Moreover, any water generated by tunnel construction would be collected at the working shaft and diverted to the sewer for treatment by either the Sanitation Districts at the JWPCP or the city of Los Angeles at the Terminal Island Water Reclamation Plant. Impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for a discussion of operational impacts of the tunnels applicable to this threshold. Operation of the tunnels would not generate runoff; therefore, impacts would not occur. Operational impacts will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Construction at any shaft site has the potential to generate water, which could result in runoff that would exceed the capacity of the existing stormwater drainage system. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

See HYD-1 (Project) for details regarding the operation at the shaft sites that are applicable to this threshold. Operations at any shaft site would not generate additional runoff water; therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HYD-8. Overall Determination: No Impact.** Construction and operation of all project elements would not result in a reduced capacity for groundwater recharge. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** As discussed under HYD-8 (Program), groundwater recharge capacity refers to the capacity of an area to refill or recharge a potable groundwater aquifer and whether that refill capacity would be diminished (through reductions in soil permeability, surface area, or other effect). The construction and operation of the project elements would not occur in designated groundwater recharge areas. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HYD-9. Overall Determination: Less Than Significant Impact.** Construction and operation of all project elements would result in impacts that are less than significant regarding flood zones, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | N/A | N/A |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | N/A | N/A |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | N/A |

**Tunnel Alignments – Onshore and Offshore.** Construction and operation of the onshore and offshore tunnels would be located below ground surface. Therefore, they would not be located within a designated 100-year flood zone. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** The City of Los Angeles General Plan Safety Element (1996) identifies several shaft sites that are located in the 100-year and 500-year flood zones. The TraPac, Angels Gate, and Royal Palms shaft sites are within the 100-year flood zone, and the Southwest Marine shaft site is located within the 500-year flood zone. Construction of the project at the shaft sites identified in the flood zones would involve heavy and large equipment; however, it would not involve any permanent structures or homes. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

Under operating conditions, all of the shaft sites would consist of a belowground access structure. There could be some aboveground facilities that would not result in impeding or redirecting flood waters. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas**. Because there are no flood zones in the ocean, impacts associated with flooding and flood zones are not applicable and will not be addressed in the EIR/EIS at the project level or in the Marine Environment Section XI.

**HYD-10. Overall Determination: No Impact.** Construction and operation of the project elements would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Therefore, impacts would be less than significant and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | N/A | N/A |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | N/A | N/A |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | N/A |

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** No levees or dams are located within the vicinity of the project elements (California Department of Conservation 1999e, 1999f). Furthermore, once operational, project elements would not require an increase in employees and, therefore, would not expose people to flooding. Finally, once operational, all project elements would be below ground surface, with the potential for a few aboveground facilities. These structures would have a limited potential for damage during flooding. Construction and operational impacts would not occur; therefore, this issue will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas**. Because there is no possibility for flooding through the failure of a dam or levee during the construction or operation of the riser and diffuser, impacts associated with flooding are not applicable and will not be addressed in the EIR/EIS at the project level or in the Marine Environment Section XI.

**HYD-11. Overall Determination: Potentially Significant Impact.** Construction of several project elements would be located within designated tsunami inundation zones. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**Tunnel Alignments – Onshore and Offshore.** Construction and operation of the onshore and offshore tunnel would be located in the subsurface. The subsurface is not affected by tsunamis, seiches, or mudflows; therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East, JWPCP West, and Angels Gate.** The JWPCP East and JWPCP West shaft sites are located inland and not within a tsunami inundation zone. The JWPCP is a fully developed industrial site with wastewater treatment facilities and has no topographic variation or relief that could support a mudflow. Per the City of Los Angeles General Plan Public Safety Element (1996), the Angels Gate shaft site is located outside of the tsunami hazard zone; therefore, it would not experience the potential effects of a tsunami. Furthermore, the Angels Gate shaft site is relatively flat and would have a low potential for a mudflow. Therefore, construction and operational impacts associated with these three shaft sites would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – TraPac, LAXT, Southwest Marine, and Royal Palms.** The TraPac, LAXT, Southwest Marine, and Royal Palms shaft sites are located within a designated tsunami inundation zone (County of Los Angeles 2009). Furthermore, Royal Palms is located at the base of a coastal bluff and thus could be affected by a mudslide during inclement weather. Therefore, construction impacts at Royal Palms would be potentially significant and will be addressed in the EIR/EIS at the project level.

During operations, the shaft sites would primarily consist of a self-contained, belowground access structure. The shaft sites could have a few low-profile, aboveground facilities. These facilities would not be subject to inundation by a tsunami or mudflow because of their low profile and the fact that they would be self-contained. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** The riser and diffuser areas are not at risk for mudflows or seiche due to the lack of exposed steep slopes or confined bodies of water in the area. Furthermore, these areas are located in the ocean and, therefore, not subject to mudflows or seiches. However, the riser and diffuser areas and existing ocean outfalls are located in a tsunami zone. Therefore, during construction, impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Once the riser and diffuser and/or existing ocean outfalls are constructed, they would be located on the bottom of the ocean and not susceptible to a tsunami; therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**HYD-12. Overall Determination: No Impact.** Construction and operation of the project elements would not substantially increase workers' or the public's actual or potential exposure to wastes or pathogens. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Hydrology, Water Quality (Freshwater), and Public Health is specific to freshwater impacts. All impacts on ocean water quality associated with the construction and operation of the riser and diffuser are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** Construction and operation of project elements would not substantially increase workers' or the public's actual or potential exposure to wastes or pathogens. Construction or operation of any tunnel or shaft would not involve potential wastes or pathogens; therefore, there would be no risk of exposure to workers or the public. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Land Use and Planning Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **X.** | **LAND USE AND PLANNING.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| LU-1. | Physically divide an established community? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| LU-2. | Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| LU-3. | Be located within the vicinity of a private airstrip and result in a conflict with the airport land use plan, or where such a plan has not been adopted, be located within 2 miles of an airport or private airstrip and result in safety hazard for people residing or working in the project area? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |

## Land Use and Planning Program Discussion

**LU-1. Overall Determination: No Impact.** Construction and operation of the program elements would not divide an established community. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Conveyance improvements would generally be constructed underground within public rights-of-way in existing roads. Therefore, construction would not divide an existing community, and work would be temporary. Once operational, the improvements to the conveyance system would be located completely underground and, therefore, would not divide an existing community. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** Generally, the program elements would be constructed and operated within the footprint of existing JOS facilities. Biosolids management would occur at existing beneficial use or land application facilities, and no new facilities would be built to accommodate the additional biosolids generated by the program. Therefore, construction and operation of the WRPs and JWPCP would not physically divide an established community, and impacts would not occur. This issue will not be addressed in the EIR/EIS at the program level.

**LU-2. Overall Determination: Potentially Significant Impact.** Construction and operation of several program elements could conflict with applicable land use plans, policies, or regulations. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | X |
| JWPCP – Biosolids Management | N/A | X |

**Conveyance System.** Improvements to the conveyance system generally would be constructed and operated within the public rights-of-way of existing streets. Permits from the jurisdictions the conveyance system would be located in may be required; however, because the improvements would occur within the public rights-of-way of existing streets, they would not conflict with any applicable land use plan, policy, or regulation of the jurisdictions. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** The construction and operation of the WRPs and JWPCP would occur in multiple jurisdictions as identified in Table 2-1 of this appendix.

The modifications to the WRPs would be located in the county of Los Angeles and the cities of Cerritos, Long Beach, and Pomona. Therefore, the construction of plant expansion at the SJCWRP and process

optimization at the SJCWR, POWRP, LCWRP, and LBWRP would be subject to the general plans and zoning of Cerritos, Long Beach, and Pomona, and the General Plan of the County of Los Angeles. Furthermore, the majority of the program is located in the Southern California Association of Governments (SCAG) region; therefore, the program elements would also be subject to the regional comprehensive plan. Construction at the WRPs could conflict with these applicable land use plans and regulations and will be addressed in the EIR/EIS at the program level. Once these program elements are complete and operational, they are not expected to conflict with applicable land use plans. However, this issue will be addressed in the EIR/EIS at the program level.

WRP effluent management would result in the continued discharge of treated effluent from existing discharge points into receiving waters. Discharge of treated effluent cannot conflict with applicable land use plans, policies, or regulations. Policies that specifically regulate the quality of the discharge are discussed in Hydrology, Water Quality (freshwater) and Public Health Section IX and Chapter 11. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the program level.

The JWPCP is located in the city of Carson, where the construction of the solids processing digesters and the increase in the operations of biosolids management would occur. However, the biosolids would then be transported to other locations in the state of California. These locations include the counties of Kings, Kern, Yuma, San Bernardino, and Riverside. Therefore, the construction of the solids processing digesters and the operation of biosolids management could conflict with applicable land use plans, policies, and regulations. Once the solids processing digesters are complete and operational, they are not expected to conflict with applicable land use plans. However, this issue will be addressed in the EIR/EIS. Therefore, construction and operation will be addressed in the EIR/EIS at the program level.

**LU-3. Overall Determination: No Impact.** All program elements would not be located within the vicinity of a private airstrip or within 2 miles of an airport and would not conflict with an airport land use plan. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Although it is unknown where the improvements to the existing conveyance system would occur under the program, construction and operation of the improvements to the conveyance system would not conflict with an airport land use plan or result in a safety hazard. The conveyance system is located completely underground and while cranes and heavy equipment may be used during construction of the improvements, they would not be so large or tall as to affect air traffic. Furthermore, once the conveyance system improvements are operational, they would generally be located underground. Therefore, impacts associated with the construction and operation of the conveyance improvements would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** The only program facility located within 2 miles of an airport is the LBWRP (ESRI 2009b). The Los Alamitos Army Airfield is located approximately 1 mile south/southeast of the LBWRP. The I-605 separates the LBWRP and the airfield. The Long Beach Airport is approximately 2.7 miles from the LBWRP, just outside the 2-mile radius of the threshold. Construction and operation of the program elements would not have an impact on either the Los Alamitos Army Airfield or the Long Beach Airport. Construction of process optimization facilities at the LBWRP would include heavy

equipment and perhaps some typical construction cranes; however, the cranes would not be sufficiently tall to obstruct or conflict with any air traffic. All construction would occur within the footprint of the existing LBWRP. Once operational, the majority of the process optimization facilities at the LBWRP would be underground and would not obstruct air traffic. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the program level.

## Land Use and Planning Project Discussion

**LU-1. Overall Determination: No Impact.** Construction and operation of all project elements would not physically divide an established community. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** Construction and operation of all project elements would be located at existing industrial facilities, existing open space areas, underground, or in the middle of the ocean; they would not be located in the middle of a community. Therefore, construction and operation of all project elements would not physically divide an established community, and impacts would not occur. This issue will not be addressed in the EIR/EIS at the project level.

**LU-2. Overall Determination: Potentially Significant Impact.** Construction and operation of project elements could conflict with applicable land use plans, policies, or regulations of an agency with jurisdiction over project elements, as discussed below. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

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**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** Construction of project elements would occur over multiple jurisdictions as identified in Table 2-2 of this appendix. The onshore tunnel would extend through the city of Carson and the Port of Los Angeles, and the communities of Wilmington and San Pedro, which are located in the city of Los Angeles. The shaft sites also would be located in the city of Carson, the Port of Los Angeles, and the communities of San Pedro and Wilmington. Therefore, these project elements would be subject to the City of Los Angeles and City of Carson General Plans and zoning, the Community Plans of San Pedro and Wilmington, the General Plan Element for the Port, the Community Plan for the Port (Port Master Plan), and potentially other applicable land use plans of these

cities and communities. Furthermore, several project elements are located within the Local Coastal Plan of the San Pedro Community. The entire project is located in the SCAG region; therefore, construction of the project elements would also be subject to the regional comprehensive plan. Construction of all project elements could conflict with these applicable land use plans, policies, or regulations and, therefore, impacts would be potentially significant. This issue will be addressed in the EIR/EIS at the project level. Once the project elements are complete and operational, the project elements are not expected to conflict with applicable land use plans. However, this issue will be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** The SP Shelf riser and diffuser area is located more than 3 nautical miles off the southern California coast. Therefore, it is located in federal waters, rather than state waters, and is primarily governed by the Coastal Zone Management Act. The PV Shelf riser and diffuser area and the existing ocean outfalls are located within 3 nautical miles of the southern California coast. Therefore, they are located in state waters, primarily governed by the California Coastal Act and local coastal programs. Construction and rehabilitation could conflict with these applicable plans, policies, and regulations. This issue will be addressed in the EIR/EIS at the project level. Once the project elements are complete and operational, the project elements would be located on the seafloor and are not expected to conflict with applicable land use plans. However, this issue will be addressed in the EIR/EIS at the project level.

**LU-3. Overall Determination: No Impact.** None of the project elements are located within 2 miles of an airstrip or airport or located within an airport land use plan. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** Construction and operation of the project elements would not be located within 2 miles of a public or private airstrip and would not conflict with any airport land use plans (ESRI 2009b). Therefore, there would be no construction or operational impacts associated with all project elements. This issue will not be addressed in the EIR/EIS at the project level.

## Marine Environment (Marine Hydrology, Water Quality, Biological Resources, Noise and Public Health) Checklist

| | | Program (marine environment thresholds are generally not applicable to the program elements) | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XI.** | **MARINE ENVIRONMENT (MARINE HYDROLOGY, WATER QUALITY, BIOLOGICAL RESOURCES, NOISE AND PUBLIC HEALTH).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| MAR-1. | Create pollution, contamination, or nuisance, as defined in Section 13050 of the California Water Code (CWC), or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |
| MAR-2. | Substantially degrade marine sediment quality or character? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |
| MAR-3. | Result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |
| MAR-4. | Result in the substantial degradation or disruption of habitat for marine biota or local biological communities? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |

| | | Program (marine environment thresholds are generally not applicable to the program elements) | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XI.** | **MARINE ENVIRONMENT (MARINE HYDROLOGY, WATER QUALITY, BIOLOGICAL RESOURCES, NOISE AND PUBLIC HEALTH).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| MAR-5. | Interfere with the movement/migration corridors of marine biota? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |
| MAR-6. | Result in adverse effects to public health? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |
| MAR-7. | Impair beneficial uses designated in the California Ocean Plan | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Marine Environment (Marine Hydrology, Water Quality, Biological Resources, Noise and Public Health) Program Discussion

Please note that impacts on the San Gabriel River Tidal Prism are addressed in Hydrology, Water Quality (Freshwater), and Public Health Section IX.

The conveyance system; plant expansion at the SJCWRP; process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP; effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP; new solids processing digesters at the JWPCP; and the biosolids management at the JWPCP and throughout California would not be located in the marine environment. These program elements would be constructed and operated on land. Therefore, marine environment thresholds do not apply to these program elements and marine issues will not be addressed in the EIR/EIS at the program level.

## Marine Environment (Marine Hydrology, Water Quality, Biological Resources, Noise and Public Health) Project Discussion

Construction and operation of the riser and diffuser on either the SP Shelf or the PV Shelf, or construction and operation of the rehabilitation of the existing ocean outfalls, are the only project elements that would be located in the marine environment and, therefore, could have an impact on the marine environment. Construction at the Royal Palms shaft site would occur in proximity to the ocean and could affect the marine environment. The construction and operation of all other project elements would occur on land. Therefore, the marine environment thresholds only apply to the riser and diffuser areas and the Royal Palms shaft site; other project elements will not be addressed in this section and the EIR/EIS at the project level.

**MAR-1. Overall Determination: Potentially Significant Impact.** Construction and operation on all the riser and diffuser areas could create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC, or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or state water quality control plan for ocean waters for concentration and emissions of discharge. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Riser/Diffuser Areas.** Construction activities such as sediment excavation and ballast rock placement, as well as utilizing equipment that requires fuels, would result in potentially significant impacts. Additionally, construction and operations could take place either in or near the dichlor-diphenyl-tricholorethan/ polychlorinated biphenyl (DDT/PCB) Study Area as discussed in MAR-3 (Project). Therefore, impacts would be potentially significant, and this issue will be addressed in the EIR/EIS at the project level.

**MAR-2. Riser/Diffuser Areas – Overall Determination: Potentially Significant Impact.** Construction and operation on all the riser and diffuser areas could substantially degrade marine sediment quality or character. Therefore, impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Riser/Diffuser Areas.** As discussed in MAR-4 (Project), benthic communities are adapted to live in specific types of sediment. The construction of the SP Shelf or the PV Shelf riser and diffuser could disturb the marine sediment quality or character. It would include the construction of either a riser and diffuser on the SP or PV Shelf, and/or include modifications to the existing ocean outfall system on the PV Shelf. This in-water construction could suspend and transport sediment to different areas of the ocean floor. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

The operation of the riser and diffuser and rehabilitation of the existing ocean outfalls would include the discharge of treated effluent into the Pacific Ocean. Depending on the ocean currents and the discharge at the new location, the discharge could substantially degrade marine sediment quality or character around the diffuser. Operational impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**MAR-3. Overall Determination: Potentially Significant Impact.** Construction and operation on all riser and diffuser areas could result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern. Therefore, impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Riser/Diffuser Areas.** Construction and operation of the riser and diffuser on the SP Shelf or PV Shelf and of the existing ocean outfalls could result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive marine plant or animal species or a species of special concern. Impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**MAR-4. Overall Determination: Potentially Significant Impact.** Construction and operation on all riser and diffuser areas could result in the substantial degradation or disruption of marine habitat or local biological communities. Therefore, impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Riser/Diffuser Areas.** Benthic (bottom dwelling) and demersal (bottom associated) marine species are adapted to live with specific bottom types and, on a finer scale, often show preferences among similar types of sediments. For example, species that burrow through or live in tubes within soft sediments (infauna) would not be found on exposed rocks, while those that form permanent attachments to hard surfaces would not be successful in a sand bed. Within these broader soft-bottom and hard-bottom habitat types, there are further influences of sediment characteristics, so that different assemblages are found in fine sand and coarse sand bottoms, or on low-relief rock cobble versus a high-relief rocky reef. In addition, water depth, currents, and nutrient availability play important roles in bottom community characteristics.

Information from a photographic survey of marine communities on the SP Shelf was conducted with a geological survey of the same area (Cadien et al. 2006). Photographic transect survey data and professional knowledge was used to identify marine habitats (Cadien et al. 2006). All hard- and soft-bottomed sediment types on the shelf and areas of the slope from an 8- to 255-meter (26- to 837-foot) depth were examined. Habitat and bottom types on the SP and PV Shelves tend to be patchy, with mixed bottom types common. Overall, the SP Shelf has bottom areas with abrupt transitions from soft- to hard-bottom, but frequently bottom areas are more transitional with overlap of habitats and bottom types within an area. The survey identified seven habitat types on the shelf and upper slope, variously composed of seven community groups (Cadien et al. 2006). Information from this survey, along with sediment and geological data from this and other studies, was utilized to associate potential riser and diffuser locations with the type of marine habitats likely to be found in the area.

Bottom sediments on the PV Shelf appear to be alternating layers of sand and clay through most of the southeastern extent of the area with sediments comprising clay with some thin sand layers to the northwest (Fugro 2011). The San Pedro escarpment is located on the PV Shelf, and the San Pedro Sea Valley is located to the south. While the actual habitat composition through most of the PV Shelf area (on the SP Shelf) was not determined, soft-bottomed communities are likely similar to the mid-shelf and outer shelf/upper slope communities found during the photographic transect survey. Hard-bottomed habitat detected by remote sensing on the PV Shelf is near the San Pedro Sea Valley and likely supports reef communities similar to those found elsewhere on the SP Shelf. The photographic survey revealed that the composition of assemblages on the shelf related to depth gradients and bottom type, as expected. All assemblages were relatively widespread on the shelf.

Sediments vary on the SP Shelf. At approximately 65 meters (213 feet), they are composed of alternating layers of sand and clay, with deep sand (greater than approximately 5 meters or 15 feet) bottom sediments. Marine habitat in the vicinity of the SP Shelf riser and diffuser area appears to be primarily soft-bottomed, bioturbated muddy sand, based on remote sensing data. There are some hard-bottom areas;

however, the photographic transect found primarily soft-bottomed habitat with a mid-shelf community typified by brittle stars and white sea urchins (Dartnell et al. 2006; Cadien et al. 2006). Slightly down slope on the transect is an area identified as outer shelf/upper slope habitat. This habitat is typified by fragile sea urchins and Pacific sanddab. Further down slope, the mid-shelf community is again common. In addition, some hard-bottomed habitat was noted in photographic transects to the southeast (Dartnell et al. 2006; Cadien et al. 2006). Hydroids and bryozoans, as well as hard-bottom associated species such as lingcod and blackeye goby, likely dominate this nearby reef habitat.

The SP Shelf and PV Shelf riser and diffuser areas and the existing ocean outfalls are located within the Pacific Coast Groundfish Fishery Management Plan (FMP). The FMP identifies essential fish habitat (EFH) off the coast of California, and the goals and policies of the FMP are to be considered in conjunction with the national standards of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). EFH is defined as those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. The SP Shelf and PV Shelf are both areas identified as EFH within the FMP. Habitat for recreational fishing is also important on the SP and PV Shelves. There are known recreational fishing reefs located on both shelves within the general vicinity of the PV Shelf riser and diffuser area. There are two fishing reefs located on the PV Shelf within the general vicinity of the riser and diffuser locations. There are also two fishing reefs located on the SP Shelf within the general vicinity of the riser and diffuser locations. Target species at these reefs would be rockfish, lingcod, ocean whitefish, and California scorpion fish. Kelp and sand bass might be at reefs located at shallower depths.

Construction of a new riser and diffuser could disrupt the ocean floor around the riser and diffuser location; therefore, construction could result in a substantial loss, degradation, or disruption of habitat of marine biota or local biological communities. However, construction of a new ocean outfall would provide habitat, just as the existing ocean outfall provides habitat. This would be a beneficial impact.

As discussed in MAR-2 (Project), there would be some potential for the discharge of the new ocean outfall to change sediment characteristics and, therefore, habitat, during its operation.

Rehabilitation of the existing ocean outfall system could also result in degradation or disruption of marine biota or local biological communities. The existing ocean outfalls would need to be inspected, and new ballast rock may need to be added to the outfall. This could disrupt the extensive and variable communities that are currently established on the existing ocean outfalls.

Therefore, construction and operation of the new riser and diffuser and rehabilitation of the existing ocean outfalls could result in the substantial loss, degradation, or disruption of habitat for marine biota or local biological communities. Construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**MAR-5. Overall Determination: Potentially Significant Impact.** Construction and operation on all riser and diffuser areas could interfere with the movement/migration corridors of marine biota. Therefore, impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Riser/Diffuser Areas.** Disturbances associated with construction related to water quality, underwater sound, vessel strikes, and entanglement could interfere with migration corridors. Therefore, construction of the riser and diffuser and rehabilitation of the existing ocean outfalls would have the potential to interfere with the movement/migration corridors of marine biota. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts are not expected to occur because the riser and diffuser and the existing ocean outfalls are located on the seafloor; however, this issue will also be addressed in the EIR/EIS at the project level.

**MAR-6. Riser/Diffuser Areas – Overall Determination: Potentially Significant Impact.** Construction impacts would not occur and will not be addressed in the EIR/EIS at the project level. Operation on all riser and diffuser areas could result in adverse effects to public health. Therefore, operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | N/A | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | N/A | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | X |

**Riser/Diffuser Area – San Pedro Shelf and Palos Verdes Shelf.** Construction impacts are not applicable because treated effluent would not be released during construction. Under operating conditions, the SP Shelf and PV Shelf riser and diffuser would release secondary treated effluent into the Pacific Ocean at a newly located discharge location. While secondary treated effluent does not adversely affect public health due to its level of treatment and removal of bacteria, this issue will be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – Existing Ocean Outfalls.** Rehabilitation of the existing ocean outfalls would allow for the continued use of the existing ocean outfalls and would not adversely affect public health. Under this project element, there would be no net increase in the amount of discharge from the ocean outfall. Furthermore, there would be no change in the quality of the effluent. Therefore, the discharge would remain the same as the existing conditions, which currently does not adversely affect public health. However, operation of the rehabilitation of the existing ocean outfalls will be addressed in the EIR/EIS at the project level.

**MAR-7. Overall Determination: Potentially Significant Impact.** Construction and operation on all riser and diffuser areas could impair beneficial uses designated in the California Ocean Plan. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**Shaft Site – Royal Palms.** Construction at the Royal Palms shaft site could affect beneficial uses of the beach and coastal area as designated in the California Ocean Plan. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Once the shaft site is operational, existing conditions will return; therefore, impacts are not expected to occur; however, operational impacts will be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – San Pedro Shelf and Palos Verdes Shelf.** Marine beneficial uses and water quality standards are managed by the State Water Resources Control Board (SWRCB) and the nine California RWQCBs. SWRCB formulates and adopts a water quality control plan for the marine waters of California in the California Ocean Plan (Ocean Plan) (SWRCB 2005). The Ocean Plan identifies applicable beneficial uses of marine waters and establishes water quality objectives necessary to achieve and maintain the beneficial uses (SWRCB 2005). The beneficial uses identified for the Pacific Ocean by the Ocean Plan include industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated areas of special biological significance (ASBS); management of rare and endangered species; marine habitat; fish migration; fish spawning; and shellfish harvesting (SWRCB 2005).

The beneficial uses identified by the Los Angeles RWQCB Basin Plan (Basin Plan) for the general nearshore[2] (Los Angeles RWQCB 1995) and offshore areas in Los Angeles County are similar to those uses identified in the Ocean Plan, and they include industrial service supply; navigation; water contact recreation; water non-contact recreation; commercial and sport fishing; marine habitat; wildlife habitat; the support of rare species; the support of migration patterns; and high quality waters that support the spawning and early development of fish and the suitable collection of shellfish for human consumption and commercial or sport purposes (Los Angeles RWQCB 1995). The RWQCB will evaluate the request for 401 certification for the construction and operation of a diffuser on the SP Shelf or PV Shelf based upon the beneficial uses and water quality standards.

Constructing the new riser and diffuser on either the SP Shelf or PV Shelf could disturb ocean sediment as discussed in MAR-2 (Project). Furthermore, it would be constructed either within or in proximity to the designated DDT/PCB Study Area as discussed in MAR-2 (Project) and MAR-1 (Project). This could temporarily affect designated beneficial uses. Under operating conditions, the new riser and diffuser would release secondary treated effluent into the Pacific Ocean. The release at the San Pedro and Palos Verdes diffuser and riser areas would be a newly located discharge influenced differently by the currents

[2] Nearshore is defined by the Basin Plan as: Nearshore includes the zone bounded by the shoreline and a line 1,000 feet from the shoreline or the 30 foot contour depth, whichever is farther from the shoreline.

than the present discharge at the existing ocean outfalls. Although the amount of discharge would not change from what is currently released at the existing ocean outfalls, the change in location and the influence of currents could result in an impact on beneficial uses. Therefore, construction and operation of the new riser and diffuser has the potential to substantially affect designated beneficial uses and would result in potentially significant impacts that will be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – Existing Ocean Outfalls.** Rehabilitation of the existing ocean outfalls could affect designated beneficial uses. During construction, the DDT/PCB study area could be disturbed. During operation there would be no net increase in the amount of discharge from the existing ocean outfalls. Therefore, the discharge would remain the same as the existing conditions. Currently, the discharge does not result in affecting designated beneficial uses; however, this will be addressed in the EIR/EIS at the project level. Therefore, construction and operational impacts for the rehabilitation of the existing ocean outfalls will be addressed in the EIR/EIS at the project level.

## Noise and Vibrations (Terrestrial) Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XII.** | **NOISE AND VIBRATIONS (TERRESTRIAL).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| NOI-1. | Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| NOI-2. | Expose persons to or generate excessive groundborne vibration or groundborne noise levels? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| NOI-3. | Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? | ☒ | ☐ | ☐ | ☐ | ☒ | ☐ |
| NOI-4. | Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| NOI-5. | Be located within an airport land use plan area, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XII.** | **NOISE AND VIBRATIONS (TERRESTRIAL).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| NOI-6. | Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |

## Noise and Vibrations (Terrestrial) Program Discussion

**NOI-1. Overall Determination: Potentially Significant Impact.** Construction and operation of several program elements could expose persons to or generate noise levels in excess of standards. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | X |

**Conveyance System.** Construction of approximately 33 miles of conveyance system upgrades would likely exceed standards established in local general plans or noise ordinances. This construction would generally occur within public rights-of-way along roads; however, it could be located in residential neighborhoods or within immediate proximity to sensitive receptors. Sensitive noise receptors are generally defined by specific city or county jurisdictions but typically include residential uses, institutional uses such as schools, and hospitals and parks. Therefore, construction of the conveyance improvements would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once operational, the conveyance system would be located underground and would be used to transport wastewater to the WRPs and JWPCP for treatment. The conveyance of wastewater would not result in any noise. No new pumping stations or generators would be part of the operation of the conveyance system. Therefore, the operation of the conveyance improvements would not exceed standards established by a local general plan or noise ordinance. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** The WRPs are primarily located in industrial areas immediately adjacent to freeways and major arterial roads. Traffic noise generated by automobiles is the main source of noise in the WRP areas. Depending on the size of the freeway or road and the traffic patterns, approximately 70 to 78 A-scale decibels (dBA) of noise can be generated at 50 feet. Sensitive noise receptors are generally defined by specific city or county jurisdictions but typically include residential uses, institutional uses such as schools, and hospitals and parks. Generally, potentially sensitive receptors adjacent to the SJCWRP, POWRP, and LBWRP that would experience construction activities under the program would be located more than 300 feet away from construction activities. Iron-Wood Nine Golf Course is within the footprint of the LCWRP and may be considered a sensitive noise receptor closer than 300 feet.

Noise levels generated by construction equipment (or by any point source) decrease at a rate of approximately 6 dBA per doubling of distance from the source (Harris 1979). Therefore, if a particular construction activity generated average noise levels of 89 dBA at 50 feet, the noise level would be 83 dBA at 100 feet, 77 dBA at 200 feet, 71 dBA at 400 feet, and so on. This calculated reduction in noise level is based on the loss of energy resulting from the geometric spreading of the sound wave as it leaves the source and travels outward. Intervening structures that block the line of sight, such as buildings, would further decrease the resultant noise level by a minimum of 5 dBA. Therefore, much of the construction noise generated by the WRP expansion and upgrades may be attenuated to acceptable levels (below 65 dBA) prior to reaching the sensitive receptors. The Sanitation Districts may use drilled piles for the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP. This would include a drill auger, inserting an I-beam, and backfilling. The Sanitation Districts

currently never pile drive within their facilities and would not pile drive for the program construction activities because vibrations from the pile driving can damage the existing facilities.

Construction-generated noise is typically exempt per jurisdictional municipal codes if the construction is conducted during daytime hours and not on Sundays or federal holidays. However, some construction may occur in the evening hours and, therefore, would not comply with existing standards. Therefore, a discussion of the construction impacts and attenuating measures will be incorporated in the EIR/EIS at the program level.

Operational noise for the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not result in a significant increase over the ambient noise levels at the existing WRP facilities or surrounding areas. Currently, the ambient noise levels of the facilities are that of an industrial use next to freeways. The Sanitation Districts currently use noise attenuating mechanisms at all their plants including locating pumps below ground surface and noise reduction measures on all compressors. The new facilities at the WRPs would primarily be underground or would blend in with existing equipment, which do not currently create substantial noise (i.e., above 60 dBA). All new equipment would either be located below ground or would have noise reducing mechanisms that are similar to those currently used by the Sanitation Districts. It is anticipated the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would not include alarms, bells, or other loud industrial noises and would operate as the current equipment at the facilities operates. Finally, no additional loud speaker systems would be added at the facilities. Therefore, it is reasonable to assume operation would increase the ambient noise level of less than 5 dBA, which is barely audible to the human ear. Furthermore, there would be no new employees associated with the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP; therefore, there would be no increase in traffic noise generated by employees. Operational impacts from the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would be less than significant and will not be addressed in the EIR/EIS at the program level.

Operation of WRP effluent management at each of the WRPs would result in a change in volume of treated effluent discharged into receiving waters from existing discharge points. Currently, the Sanitation Districts discharge effluent, which may generate minor levels of noise. Simply changing the volume of discharging effluent would not create additional noise that would exceed standards established in a local general plan or noise ordinance. Therefore, operational impacts from WRP effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** The existing noise setting at the JWPCP is primarily dominated by I-110 and traffic noise. The Pacific Coast Highway (State Route 1) also passes near to the plant. There are several sensitive receptors near the facility including residences to the north, south, east, and west. Wilmington Junior High is to the east and Bay Harbor Hospital and the Kaiser Foundation Hospital are located over 1 mile to the southwest. Pumps, aerators, trucks, and other equipment at the JWPCP generate noise, however, not above normally acceptable noise levels for industrial uses.

The construction of the solids processing digesters would be located within the existing JWPCP footprint. It would result in similar construction noise as that generated at the WRP facilities. Pile driving would not occur as the Sanitation Districts do not use pile driving to construct treatment plant facilities. Therefore, much of the construction noise generated by the solids processing may be attenuated to acceptable levels (below 65 dBA) prior to reaching the sensitive receptors. Furthermore, construction-generated noise is typically exempt per jurisdictional municipal codes if the construction is

conducted during daytime hours and not on Sundays or federal holidays. Although construction at the JWPCP would not occur during the evening/nighttime hours, or on Sundays or federal holidays, construction noise attenuating measures are generally applied. Therefore, a discussion of the construction impacts associated with solids processing and attenuating measures will be addressed in the EIR/EIS at the program level.

Once the new solids processing equipment is operational, it would not generate any noise. Currently, the existing solids processing equipment does not generate noise levels above those typical of the JWPCP uses. Furthermore, there would be no increase in employees at the JWPCP due to the operation of the new solids processing digesters; therefore, no new noise from employee trips would occur. The new solids processing digesters equipment would not add significantly to the existing ambient noise level. Therefore, operation of the new solids processing digesters would not expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

An increase of approximately 20 truck trips per day at the JWPCP would be generated by the increase in biosolids. Therefore, the operation of biosolids management could generate noise levels on existing streets. Operational impacts associated with the biosolids management at the JWPCP would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once the biosolids leave the JWPCP, they would be transported to multiple locations throughout California. No single location would receive all trips. Furthermore, all of the locations for beneficial use, landfill, or land application of biosolids are located in either industrial areas or agricultural areas, typically with existing elevated ambient noise levels. Therefore, any slight increase in truck trips at each of the locations would not generate significant noise levels above existing ambient levels. Operation of biosolids management at the beneficial use, landfill, or land application locations would be less than significant and will not be addressed in the EIR/EIS at the program level.

**NOI-2. Overall Determination: Less Than Significant Impact.** Construction and operation of the program elements would not result in excessive groundborne vibrations or groundborne noise levels. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction activities associated with grading and excavation may result in some minor amount of ground vibration. Construction of conveyance improvements would not involve special construction methods such as pile driving or blasting. Vibration from conventional construction activity is typically below a level of human perception and well under levels that would cause damage to existing buildings, when the activity is more than approximately 50 feet from the receiver. For this program element, conventional construction activities could take place at distances closer than 50 feet from sensitive receptors. Based on data from the Federal Transit Administration (FTA), small bulldozers (which are representative of the size of construction equipment that would be on site) produce vibration levels of 0.003 inches per second (IPS) peak particle velocity (PPV) at a distance of 25 feet. This level is well below widely accepted levels of perception thresholds (for example, the California Department of Transportation (Caltrans) has identified a PPV of between 0.0059 and 0.019 IPS PPV as the threshold of

human perception). The FTA maintains a 0.12 IPS PPV threshold for potential damage to "extremely fragile historic buildings" (Caltrans 2004). Additionally, vibration from these activities would be short-term and would end when construction is completed; therefore, construction and operational impacts associated with the conveyance system would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would involve constructing large underground storage tanks within the existing footprint of these WRPs. This construction would not involve traditional pile driving as described in NOI-1(Program). Furthermore, blasting would not occur because of the potential damage that could be done to the existing facilities located at each WRP. Therefore, pile driving and blasting would not result in groundborne vibrations. The use of construction equipment would result in a minor increase in groundborne vibrations during grading and excavation. However, as identified in the conveyance discussion, the vibrations would be well below widely accepted levels of perception thresholds. Therefore, construction impacts associated with groundborne vibrations at the SJCWRP, POWRP, LCWRP, and LBWRP would be less than significant and will not be addressed in the EIR/EIS at the program level.

Groundborne noise and vibration associated with plant expansion during construction and operation may occur, but is expected to be limited and may only occur during use of heavy construction equipment. The Sanitation Districts do not pile drive (or use other equipment with the potential for large or sustained vibration effects) within their facilities because vibrations can damage the existing facilities. Therefore, construction and operation associated with plant expansion is expected to be less than significant and will not be addressed in the EIR/EIS at the program level.

The operation of process optimization facilities would involve operating underground wastewater storage tanks and wastewater treatment facilities similar to those already located at the WRPs. Operation of these facilities would not result in groundborne vibrations. Wastewater treatment utilizes pumps and gravity to treat wastewater in large concrete facilities. None of the treatment processes create vibrations. Operation of process optimization would involve the storage of wastewater until the WRP can treat it. The storage of wastewater would not generate groundborne vibrations. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Operation of WRP effluent management would involve a change in the volume of tertiary treated effluent discharged from existing discharge points at each WRP. The change in volume discharged from each WRP would not result in groundborne vibrations. Therefore, operational impacts of WRP effluent management would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction at the JWPCP for the solids processing digesters may involve limited groundborne vibrations during use of heavy construction equipment; however, this construction is not expected to include pile driving, per the discussion above in NOI-1 (Program). Therefore, construction impacts associated with the solids processing digesters would be less than significant and will not be addressed in the EIR/EIS at the program level. Once operational, the new solids processing digesters would operate exactly as the existing ones and would not generate any groundborne vibrations or noise. Therefore, operation of the solids processing digesters would not result in groundborne vibrations and impacts would not occur. Operational impacts will not be addressed in the EIR/EIS at the program level.

Biosolids management at the JWPCP and at beneficial use and landfill facilities in California does not currently result in groundborne vibrations. The management includes beneficial use, landfill, and land application. At the JWPCP, there would be an increase in truck trips associated with the increase in biosolids transported to other areas of California; this increase in truck trips would not result in

groundborne vibrations. Currently, biosolids-hauling trucks use Figueroa Street to access I-110. Figueroa is bounded on both sides by the JWPCP, between Lomita and Sepulveda, and does not have any sensitive receptors to groundborne vibrations (i.e., residential homes) along it. Therefore, operation of biosolids management would not result in groundborne vibrations and will not be addressed in the EIR/EIS at the program level.

**NOI-3. Overall Determination: Potentially Significant Impact.** Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level. Operation of biosolids management at the JWPCP could result in a substantial permanent increase in ambient noise levels in the project vicinity. Therefore, operational impacts related to this specific program element would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | N/A | – |
| SJCWRP – Plant Expansion | N/A | – |
| WRP – Process Optimization | N/A | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | N/A | – |
| JWPCP – Biosolids Management | N/A | X |

**Conveyance System.** Construction impacts associated with the conveyance system are not discussed under this threshold, as construction impacts are not considered "substantial permanent increases in ambient noise levels." For a discussion of construction impacts associated with the conveyance system, see NOI-4 (Program).

See NOI-1 (Program) for a discussion of the operation of the improvements to the conveyance system. The operation of the conveyance system would not result in a substantial permanent increase in ambient noise and operational impacts would not occur. Operational impacts will not be addressed in the EIR/EIS at the program level**.**

**WRPs.** Construction impacts associated with the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP are not discussed under this threshold, as construction impacts are not considered "substantial permanent increases in ambient noise levels." For a discussion of construction impacts associated with the WRPs, see NOI-4 (Program).

See NOI-1 (Program) for a discussion of the operation of the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level**.**

As discussed in NOI-1 (Program), operation of WRP effluent management would not result in the substantial permanent increase in ambient noise. Operational impacts for WRP effluent management will not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction impacts associated with new solids processing digesters are not discussed under this threshold, as construction impacts are not considered "substantial permanent increases in ambient noise levels." For a discussion of construction impacts associated with solids processing digesters see NOI-4 (Program).

See NOI-1 (Program) for a discussion of the operation of the solids processing digesters. Operational impacts associated with the solids processing digesters would not occur and will not be addressed in the EIR/EIS at the program level**.**

See NOI-1 (Program) for a discussion of the operation of the increase in biosolids at the JWPCP. The increase in biosolids and the increase in trucks could result in a substantial permanent increase in noise in the project vicinity. Therefore, impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

**NOI-4. Overall Determination: Potentially Significant Impact.** Construction and operation of several program elements could result in a substantial temporary or periodic increase in ambient noise levels. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | X |

**Conveyance System.** Operational impacts associated with the conveyance system are not discussed under this threshold, as operational impacts are not considered "substantial temporary or periodic increase in ambient noise levels." For a discussion of operational impacts associated with the conveyance system see NOI-3 (Program).

See NOI-1 (Program) for a discussion of the construction of the improvements to the conveyance system. The construction of the conveyance improvements could result in a substantial temporary or periodic increase in ambient noise. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

**WRPs.** Operational impacts associated with the plant expansion at the SJCWRP would require the potential operation of emergency generators, which could result in substantial temporary or periodic increase in ambient noise levels; therefore, operation of the plant expansion at the SJCWRP would be potentially significant and will be addressed in the EIR/EIS at the program level.

Operational impacts associated with process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP are not discussed under this threshold, as operational impacts are not considered "substantial temporary or periodic increase in ambient noise levels." For a discussion of operational impacts associated with process optimization see NOI-3 (Program).

See NOI-1 (Program) for a discussion of the construction of the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level**.**

As discussed in NOI-1 (Program), construction would not occur under WRP effluent management and, therefore, temporary or periodic increases in ambient noise would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Operational impacts associated with the new solids processing digesters are not discussed under this threshold, as operational impacts are not considered "substantial temporary or periodic increase in ambient noise levels." For a discussion of operational impacts associated with the solids processing digesters see NOI-3 (Program).

See NOI-1 (Program) for a discussion of the construction of the solids processing digesters. Construction impacts associated with the solids processing digesters would be potentially significant and will be addressed in the EIR/EIS at the program level**.**

See NOI-1 (Program) and NOI-3 (Program) for a discussion of the operation of the increase in biosolids at the JWPCP. The increase in biosolids and the increase in truck trips could result in a substantial temporary or periodic increase in noise in the project vicinity. Therefore, operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

**NOI-5. Overall Determination: No Impact.** None of the program elements would be located within an airport land use plan area or within 2 miles of a public airport and would not expose people residing or working in the project area to excessive noise. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** It is unknown where the improvements to the existing conveyance system would occur under the program. However, construction and operation of the improvements to the conveyance system would not conflict with an airport land use plan or result in a safety hazard (see LU-3 [Program]). The conveyance system is generally located underground. Cranes and heavy equipment may be used during construction of the improvements; however, they would not be so large or tall as to impact air traffic. Furthermore, once the conveyance improvements are operational, they would generally be located underground. Therefore, impacts on airport land use plans or public airports associated with the construction and operation of conveyance improvements would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** The only program facility located within 2 miles of an airport is the LBWRP (ESRI 2009b). The Los Alamitos Army Airfield is located approximately 1 mile south/southeast of the LBWRP. The I-605 separates the LBWRP from the airfield. The Long Beach Airport is approximately 2.7 miles from the LBWRP, just outside the 2-mile radius of the threshold. None of the program elements are located within an airport land use plan area, and workers would not be subject to excessive aircraft noise levels. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**NOI-6. Overall Determination: No Impact.** Construction and operation of the program elements would not expose people residing or working in the project area to excessive noise levels associated with a private airstrip. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** See NOI-5 (Program). Impacts on airport land use plans or public airports associated with the construction and operation of conveyance improvements would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** See NOI-5 (Program). The program elements would not be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

## Noise and Vibrations (Terrestrial) Project Discussion

**NOI-1. Overall Determination: Potentially Significant Impact.** Construction at all shaft sites could expose persons to or generate noise levels in excess of standards established in a local general plan. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

All noise impacts associated with the construction and operation of the riser and diffuser on the SP Shelf, PV Shelf, and at the existing ocean outfalls are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore.** The construction of the onshore and offshore tunnel would occur below the ground, and would not result in the generation of noise levels in excess of standards established in local general plans or noise ordinances. Therefore, construction impacts would not occur and will not be addressed in the EIR/EIS at the project level.

Once operational, the onshore and offshore tunnels would not generate any noise. The tunnels would convey secondary treated effluent in self-contained tunnels from the JWPCP to the Pacific Ocean. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East and JWPCP West.** Construction at the JWPCP East or West shaft site would not include pile driving. Pile installation would use drilling methods, similar to the pile construction that would occur at the WRPs and the JWPCP for solids processing. However, the use of heavy specialized equipment would occur at these shaft sites. Therefore, construction could expose people to or generate noise levels in excess of standards established in local general plans or noise ordinances. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

Under operating conditions, there could be some surface structures located at either shaft site, such as a surge tower. Surge towers are currently part of the JWPCP facility and generate minimal noise. They function as hydrologic controls during high tides and protect the JWPCP from potential flooding. Therefore, operational impacts at the JWPCP East or JWPCP West shaft site would be less than significant and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – TraPac, LAXT, Southwest Marine, Angels Gate, and Royal Palms.** Construction of the shaft itself and construction activities at the shaft sites would use heavy specialized equipment. Construction could expose people to or generate noise levels in excess of standards established in local general plans or noise ordinances. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

During operations, the shaft sites would primarily consist of a self-contained, belowground access structure. These access structures would not generate any noise. There may be some low-profile support structures at the surface, but these support structures would not generate noise. Therefore, operation at any shaft site would not expose persons to or generate noise levels in excess of standards established in local general plans or noise ordinances. Operational impacts would not occur and will not be addressed in the EIR/EIS.

**NOI-2. Overall Determination: Potentially Significant Impact.** Construction of all land-based project elements could expose persons to or generate excessive groundborne vibration. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

All noise impacts associated with the construction and operation of the riser and diffuser on the SP Shelf, PV Shelf, and at the existing ocean outfalls are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore.** Tunneling in the onshore and offshore alignments could expose sensitive receptors to groundborne vibrations. Construction of the onshore and offshore tunnels would be potentially significant and will be addressed in the EIR/EIS at the project level. Once operational, the onshore and offshore tunnels would not result in groundborne vibrations or noise. The existing onshore tunnel and ocean outfalls do not generate any vibrations and the onshore and offshore tunnels would operate exactly like the existing tunnel and ocean outfalls. Therefore, operational impacts from the onshore and offshore tunnels would not occur and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Construction at all shaft sites could result in excessive groundborne vibrations or noise depending on the type of equipment used. This could expose surrounding sensitive receptors (such as residences and schools) to vibrations. Therefore, construction impacts would be potentially significant at any shaft site and will be addressed in the EIR/EIS at the project level.

Once operational, the shaft sites would not result in groundborne vibrations or noise levels. The shaft sites would operate to support the subsurface tunnel and ocean outfall conveying treated effluent from the JWPCP to the Pacific Ocean. No vibrations would be generated with this action. Therefore, operational impacts at any shaft site would not occur and will not be addressed in the EIR/EIS at the project level.

**NOI-3. Overall Determination: Less than Significant Impact**. Construction impacts would not occur and will not be addressed in the EIR/EIS at the project level. Operation of all land-based project elements would not result in substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | – | Shaft Site – Southwest Marine | N/A | – |
| Tunnel Alignment – Offshore | N/A | – | Shaft Site – Angels Gate | N/A | – |
| Shaft Site – JWPCP East | N/A | – | Shaft Site – Royal Palms | N/A | – |
| Shaft Site – JWPCP West | N/A | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | N/A | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | N/A | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

All noise impacts associated with the construction and operation of the riser and diffuser on the SP Shelf, PV Shelf, and at the existing ocean outfalls are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** Construction impacts associated with all project elements are not discussed under this threshold, as construction impacts are not considered "substantial permanent increases in ambient noise levels." For a discussion of construction impacts associated with all project elements see NOI-4 (Project).

See NOI-1 (Project) for a discussion of the operation impact determinations for all project elements. Operational impacts would be either less than significant (JWPCP East and JWPCP West) or would not occur (all remaining shaft sites and onshore and offshore tunnel alignments) and will not be addressed in the EIR/EIS at the project level.

**NOI-4. Overall Determination: Potentially Significant Impact.** Construction impacts at all shaft sites would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | N/A | Shaft Site – Southwest Marine | X | N/A |
| Tunnel Alignment – Offshore | – | N/A | Shaft Site – Angels Gate | X | N/A |
| Shaft Site – JWPCP East | X | N/A | Shaft Site – Royal Palms | X | N/A |
| Shaft Site – JWPCP West | X | N/A | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | X | N/A | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | X | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

All noise impacts associated with the construction and operation of the riser and diffuser on the SP Shelf, PV Shelf, and at the existing ocean outfalls, are discussed in Marine Environment Section XI.

**Tunnel Alignments – Onshore and Offshore.** See NOI-1 (Project) for a discussion of the construction impact determinations for the tunnel alignments. Construction impacts would not result in a substantial temporary or periodic increase in ambient noise levels; therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level. Operational impacts are not applicable because they are not addressed under this threshold, which specifically addresses temporary or periodic increase in ambient noise levels in the project vicinity.

**All Shaft Sites.** See NOI-1 (Project) for a discussion of the construction and operational impact determinations for all project elements. Construction impacts for all shaft sites would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts are not applicable because they are not addressed under this threshold which specifically addresses temporary or periodic increase in ambient noise levels in the project vicinity.

**NOI-5. Overall Determination: No Impact.** None of the project elements would be located within an airport land use plan area or within 2 miles of a public airport and, therefore, would not expose people residing or working in the project area to excessive noise. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** None of the project elements are located within an airport land use plan area or within 2 miles of a public airport (ESRI 2009b). Therefore, workers at the facilities would not be subject to excessive aircraft noise levels. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at project level.

**NOI-6. Overall Determination: No Impact.** None of the project elements would be located within the vicinity of a private airstrip and, therefore, would not expose people residing or working in the project area to excessive noise. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** See NOI-5 (Project). None of the project elements are located within the vicinity of a private airstrip and, therefore, would not expose people or workers to excessive noise. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Employment, Housing, Socioeconomics, and Environmental Justice Checklist

| | Program | | | Project | | |
|---|---|---|---|---|---|---|
| **XIII. EMPLOYMENT, HOUSING, SOCIOECONOMICS, AND ENVIRONMENTAL JUSTICE.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| SOC-1. (Population and Housing) Result in displacement of a large number of people necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| SOC-2. (Population and Housing) Result in displacement of substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| SOC-3*. (Environmental Justice) Result in environmental impacts that are disproportionately high and adverse on minority and low income populations? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |
| SOC-4. Cause a substantial change in local employment or the labor force? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| SOC-5. Cause a substantial decrease in property values in the project area? | ☐ | ☒ | ☐ | ☐ | ☒ | ☐ |

*Threshold SOC-3 (Environmental Justice) is a NEPA requirement and is not addressed under CEQA. Because the program is assessed under CEQA only, SOC-3 is not applicable to the program and noted as such in the analysis in this section.

## Employment, Housing, Socioeconomics, and Environmental Justice Program Discussion

**SOC-1. Overall Determination: No Impact.** Construction and operation of the program elements would not result in displacement of a large number of people necessitating the construction of replacement housing elsewhere. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** The construction of the conveyance improvements would generally occur within the public rights-of-way of existing streets. Operation of the conveyance improvements would be located underground. Therefore, construction and operation of the conveyance improvements would not result in the displacement of large numbers of people necessitating the construction of replacement housing elsewhere. Construction and operational impacts associated with the conveyance system would not occur and will not be addressed in the EIR/EIS at the program level.

Construction and operation of the plant expansion at the SJCWRP; process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP; and the new solids processing digesters at the JWPCP would all occur within the footprint of these facilities. Furthermore, biosolids at the JWPCP would be managed within the footprint of the JWPCP, would be transported along existing public rights-of-way, and would be beneficially used or land filled at existing beneficial use, landfills, or land application locations. WRP effluent management would continue to discharge treated effluent via existing discharge points into existing water bodies. Therefore, none of the construction or operation activities at the WRPs or the JWPCP would result in the displacement of large numbers of people necessitating the construction of replacement housing. Construction and operational impacts associated with these program elements would not occur and will not be addressed in the EIR/EIS at the program level.

**SOC-2. Overall Determination: No Impact.** Construction and operation of all program elements would not result in displacement of substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** As discussed in SOC-1 (Program), all construction and operation would generally take place within the existing rights-of-way of streets, the existing footprints of the WRPs and the JWPCP, and at existing beneficial use, landfill, or land application locations. There is no housing currently located at any of these sites. Therefore, the program elements would not result in a

displacement of substantial numbers of existing housing. Construction and operational impacts would not occur for any of the program elements and will not be addressed in the EIR/EIS at the program level.

**SOC-3. Overall Determination: Not Applicable.** An analysis of environmental impacts that are disproportionately high and adverse on minority and low-income populations is required by NEPA. The program elements are only analyzed under CEQA because there is no federal action as part of the construction or operation of the program elements and, therefore, NEPA is not applicable. Thus, this threshold is not applicable to the construction and operation of program elements and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | N/A | N/A |
| SJCWRP – Plant Expansion | N/A | N/A |
| WRP – Process Optimization | N/A | N/A |
| WRP – Effluent Management | N/A | N/A |
| JWPCP – Solids Processing | N/A | N/A |
| JWPCP – Biosolids Management | N/A | N/A |

**SOC-4. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not cause a substantial change in local employment or the labor force. Impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Construction of the conveyance improvements; the plant expansion at the SJCWRP; process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP; and the solids processing digesters at the JWPCP would require some construction workers. Construction firms would bid on construction contracts for the various program elements, and the winning firms would assign employees they currently employ to the construction jobs. The construction workers would not need specialized training and would be located within the JOS service area. Therefore, the construction of the program elements would not cause a substantial change in the local employment or labor force. Construction impacts for all program elements would be less than significant and will not be addressed in the EIR/EIS at the program level.

The operation of the program elements would not require the hiring of additional employees. The operation of the improvements to the conveyance system would occur underground and would convey wastewater via gravity to the WRPs and JWPCP for treatment. It would not require additional employees to operate. The operation of the plant expansion at the SJCWRP would simply allow a greater volume of wastewater to be treated and the existing employees at the SJCWRP would oversee the operation of this treatment. The operation of process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would store wastewater underground prior to treatment; the ability to store wastewater would not require additional employees. WRP effluent management could change the volume of tertiary treated effluent discharged into existing water bodies; however, the change in volume would not require any additional employees as it would continue to be discharged from existing discharge points. The new solids processing digesters would be connected to the existing system at the JWPCP, and the existing employees

would operate and maintain the new digesters. The increase in biosolids management would result in an increase in truck trips per day. However, these additional truck trips would likely be absorbed and operated by the current transportation companies hired to haul the biosolids. Therefore, the increase in biosolids would not result in the development of new transportation companies or the hiring of new employees. Operation of all program elements would not cause a substantial change in local employment or labor force. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**SOC-5. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not cause a substantial decrease in property values in the program area. Impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Construction of the conveyance improvements would generally occur within the public rights-of-way of existing streets and would not extend into private property. Construction of improvements at the WRPs and the JWPCP would occur within the footprint of the facilities and would not extend into residential neighborhoods or private property surrounding the plants. Therefore, construction impacts associated with all program elements would be less than significant and will not be addressed in the EIR/EIS at the program level.

The operation of the conveyance improvements, the improvements at the WRPs, WRP effluent management, and solids processing at the JWPCP would not result in a substantial decrease in property values in the project area. Operation of the conveyance system would occur underground, within the public rights-of-way of existing streets, and would not extend into private property. Operation of all improvements to the WRPs and JWPCP would be within the footprint of the existing facilities. WRP effluent management would continue to consist of effluent discharge into currently receiving channels. Therefore, operational impacts associated with all project elements would not occur and will not be addressed in the EIR/EIS at the program level.

Biosolids management would increase the number of truck trips from the JWPCP. However, trucks typically use Figueroa Street, between Lomita and Sepulveda, to access I-110, and there are no residential properties along this section of Figueroa to experience a decrease in property values. Therefore, the increase in truck trips would not result in a substantial decrease in property values. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

## Employment, Housing, Socioeconomics, and Environmental Justice Project Discussion

**SOC-1. Overall Determination: No Impact.** Construction and operation of all project elements would not result in displacement of a large number of people necessitating the construction of replacement housing elsewhere. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | N/A | N/A |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | N/A | N/A |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | N/A |

**Tunnel Alignments – Onshore and Offshore; All Riser/Diffuser Areas.** The onshore tunnel alignment would be constructed and operated below the ground surface. The offshore tunnel alignment and the riser and diffuser areas would be located below the seafloor and/or below the ocean surface. People and homes do not exist at these locations; therefore, this threshold is not applicable to these project elements.

**All Shaft Sites.** Construction and operation at all shaft sites would occur in primarily industrial areas (TraPac, LAXT, Southwest Marine), vacant lots owned by the Sanitation Districts (JWPCP East, JWPCP West), or open space/parking lots (Angels Gate, Royal Palms). Therefore construction and operation would not result in the displacement of any people necessitating the construction of replacement housing elsewhere. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**SOC-2. Overall Determination: No Impact.** Construction and operation of all project elements would not result in displacement of substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere. No impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | N/A | N/A |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | N/A | N/A |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | N/A |

**Tunnel Alignments – Onshore and Offshore; All Riser/Diffuser Areas.** The onshore tunnel alignment would be constructed and operated below the ground surface. The offshore tunnel alignment and the riser and diffuser areas would be located below the seafloor and/or below the ocean surface. People and homes do not exist at these locations; therefore, this threshold is not applicable to these project elements.

**All Shaft Sites.** See SOC-1 (Project). Construction and operation at any shaft site would not result in the displacement of substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere. All shafts sites are in industrial areas, on land currently owned by the Sanitation

Districts, or open space/parking lots. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**SOC-3. Overall Determination: Potentially Significant Impact.** Construction and operation of all project elements, with the exception of the offshore tunnel, have the potential to result in environmental impacts that are disproportionately high and adverse on minority and low-income populations. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction[1] | Operation[1] | | Construction[1] | Operation[1] |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

[1] Environmental justice is addressed in the EIR/EIS using significant and unavoidable determinations from other resource chapters. The final determination will be provided in the resource evaluations in each resource chapter in the EIR/EIS. Any impacts determined to be significant and unavoidable will be evaluated for environmental justice to determine if there are disproportionate effects on low-income and minority populations.

**All Project Elements (Except Tunnel Alignment – Offshore).** Construction of the project elements would occur in areas of Los Angeles known to be depressed socio-economically or known to have high minority populations. Therefore, construction of all project elements have the potential to result in environmental impacts that are disproportionately high and adverse on minority and low-income populations. Furthermore, operation of the project elements could result in environmental impacts. Therefore, construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

**Tunnel Alignment – Offshore.** The offshore tunnel alignment would be constructed below the seafloor. People do not live within the ocean and, therefore, the area above the offshore tunnel alignments does not have presence of minority or low-income population. Thus, the construction and operation of the offshore tunnel would not result in environmental impacts that are disproportionately high and adverse on minority and low-income populations. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**SOC-4. Overall Determination: Potentially Significant Impact.** Construction of all project elements has the potential to substantially change the local employment or the labor force. Therefore, construction impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**All Project Elements.** Construction of the onshore and offshore tunnels and the riser and diffuser would require specialized construction workers nationally and internationally to relocate to the JOS service area. There would likely be fewer than 100 of these highly specialized workers; however, support staff, engineers, and other construction employees, may be needed. Construction at the shaft sites would also require more construction workers than those specialized to work on the tunnels and riser and diffuser. Construction could occur from 6 to 8 years. Therefore, construction of the project elements could substantially change the local employment or labor force. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the project elements would convey treated effluent to the Pacific Ocean for discharge. The conveyance would not require any additional employees. The system would be entirely self-contained. Maintenance would be performed by the existing staff, who regularly maintains the existing ocean outfalls. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**SOC-5. Overall Determination: Less Than Significant Impact.** Construction and operation of project elements would not cause a substantial decrease in property values in the project area. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | N/A | N/A |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | N/A | N/A |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | N/A |

**Tunnel Alignments – Onshore.** The onshore tunnel could require easements to be obtained from property owners for the purpose of accessing the underground tunnel if necessary; however, the purchase of easements would not have a detrimental effect of property values as these easements would be partial underground easements and would not preclude use of the property at the surface. The underground tunnels would be accessible for service and repair work from the shaft sites. In case of an accident, any hazardous materials would be removed via the shaft sites. Therefore, the private properties would not be disturbed in order to provide access to the tunnel. Due to the average tunnel depth of 200 feet, the subsidence of the soil under the private properties would not be an issue. Additionally, purchase of the easements by the Sanitation Districts would ensure that property owners do not have any liabilities. Thus, impacts of the underground easements on private properties would be less than significant; however, the EIR/EIS will identify the parcels that may require an easement.

**Tunnel Alignments – Offshore; All Riser/Diffuser Areas.** The offshore tunnel alignment would be constructed and operated below the ground surface. The offshore tunnel alignment and the riser and diffuser areas would be located below the seafloor and/or below the ocean surface. Homes do not exist at these locations. Therefore, this threshold is not applicable to these project elements.

**All Shaft Sites.** Similar industrial uses exist in the neighborhood surrounding the JWPCP where project construction activities would occur, and no new incompatible land uses would be introduced. Construction and operation of new shaft sites would be on industrially zoned land (e.g., the Port of Los Angeles) or on Sanitation Districts' property (e.g., the JWPCP). At the Angels Gate shaft site, the closest surrounding uses are recreational; however, residential uses are located across from Gaffey. These

properties could experience temporary but adverse construction impacts, such as construction noise (Noise Section XII), for the duration of construction at this shaft site (between 4 and 8 years). During construction, affected property owners may experience a decrease in property value. However, any decrease in property value would be temporary, isolated to these homes, and would not be applicable to the whole of the project area (e.g., other shaft sites, and onshore and offshore tunnel alignments).

There are several residential properties to the north of the Royal Palms shaft site, overlooking Royal Palms Beach. As with the properties located adjacent to Angels Gate, these properties could experience temporary but adverse construction impacts, such as construction noise (these impacts are further discussed in Noise Section XII) for the duration of construction at this shaft site (between 4 and 8 years). During construction, affected property owners may experience a decrease in property value. However, any decrease in property value would be temporary, isolated to these homes, and would not be applicable to the whole of the project area (e.g., other shaft sites and onshore and offshore tunnel alignments). Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

Once operational, the shaft sites would support the conveyance of treated effluent to the Pacific Ocean for discharge. The shaft sites may include some low-profile aboveground structures such as access hatches (TraPac, LAXT, Southwest Marine, Angels Gate, and Royal Palms) or a three-story surge tower (JWPCP East and JWPCP West). The surge towers would blend in with the existing JWPCP buildings. The system would be primarily underground and entirely self-contained. Therefore, operation at any shaft site would not cause a substantial decrease in property values in the area and operational impacts would be less than significant. Operational impacts will not be addressed in the EIR/EIS at the project level.

## Public Services Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XIV.** | **PUBLIC SERVICES.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| PS-1. | Require the substantial expansion of existing fire protection facilities or the construction of new fire protection facilities to maintain an acceptable level of service? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |
| PS-2. | Require the substantial expansion of existing police service facilities or the construction of new police service facilities to maintain an acceptable level of service? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |
| PS-3. | Require the substantial expansion of existing school facilities or require the building of new facilities? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| PS-4. | Require the substantial expansion of existing parks and/or recreation opportunities or require the building of new recreation facilities? | ☐ | ☐ | ☒ | ☐ | ☒ | ☐ |
| PS-5. | Impair implementation of or physically interfere with an existing emergency response or emergency preparedness plan or emergency evacuation plan or require the preparation of a new emergency response or preparedness plan? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Public Services Program Discussion

**PS-1. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not require the substantial expansion of existing fire protection facilities or the construction of new fire protection facilities to maintain an acceptable level of service. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Typically, the need for increased fire services is either associated with an increase in population or an increase in uses or activities that require fire services because of their inherent nature (e.g., oil storage terminals). Construction and operation of the program elements would not be directly associated with an increase in population. Furthermore, as discussed below, the inherent nature of the uses of each program element is that of wastewater conveyance and treatment, and these uses typically do not generate a need for fire services. Fire services were contacted in each of the jurisdictions of the program facilities to confirm whether there was a need for expanded services associated with the program. Responses from fire services can be found in Appendix 16-A of the EIR/EIS, and they indicate that the program elements do not create a need for increased fire services. Therefore, construction and operation of the program elements would not result in the need for substantial expansion of existing fire protection facilities or the construction of new fire protection facilities; impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Construction and operation of the conveyance improvements would not require the expansion of existing fire protection facilities or the construction of new fire protection facilities. The conveyance system is currently underground and conveys wastewater to the WRPs and JWPCP for treatment and is generally located within the public rights-of-way of roads. This type of infrastructure does not require fire services because of their purpose to convey wastewater; therefore, during construction and operation of the conveyance improvements, an increase in fire services or facilities would not be required and impacts would not occur. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Construction and operation at the WRPs would not require the substantial expansion of existing fire protection facilities or the construction of new fire protection facilities. The WRPs treat wastewater and are not facilities that require regular fire protection services (see Section VIII for a discussion of hazardous materials currently used at the WRPs during operation and emergency plans). Plant expansion at the SJCWRP would involve the continued operations to treat wastewater and, therefore, would not increase the need for fire protection services. Process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would include underground storage tanks of wastewater and, therefore, would not increase the need for fire protection services. WRP effluent management would continue to release volumes of treated effluent from the WRPs into receiving waters and, therefore, would not require increased fire services. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Construction and operation at the JWPCP would not require the substantial expansion of existing fire protection facilities or the construction of new fire protection facilities. The existing solids processing digesters do not require regular fire services; the new digesters would be similar to the existing ones. The operation of biosolids management would consist of an increase in truck trips to take the biosolids from the JWPCP to existing biosolids use facilities or land application facilities. An increase in truck trips would not require expanded fire services. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**PS-2. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not require the substantial expansion of existing police service facilities or the construction of new police service facilities to maintain an acceptable level of service. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Typically, the need for increased police services is either associated with an increase in population or an increase in uses or activities that require police services because of their inherent nature (e.g., correctional facilities or prisons). Construction and operation of the program elements would not be directly associated with an increase in population. Furthermore, as discussed below, the inherent nature of the uses of each program element is that of wastewater conveyance and treatment, and these uses typically do not generate a need for police services. Police services were contacted in each of the jurisdictions of the program facilities to confirm whether there was a need for expanded services associated with the program. The responses from police services can be found in Appendix 16-A of the EIR/EIS, and they indicate that the program elements do not create a need for increased police services. Therefore, construction and operation of the program elements would not result in the substantial expansion of existing police facilities or the construction of new police facilities; impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

Construction and operation of the conveyance improvements would not require the expansion of existing police facilities or the construction of new police facilities. The conveyance system is currently underground and it conveys wastewater to the WRPs and JWPCP for treatment and is generally located within the public rights-of-way of roads. This type of infrastructure does not require police services because of their purpose to convey wastewater. During construction, traffic plans may be required to control traffic and re-route traffic; however, these types of traffic plans and any required police and security to implement them are typical of utilities located in existing public rights-of-way. Therefore, during construction and operation of the conveyance improvements, an increase in police services or facilities would not be required, and impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Construction and operation at the WRPs would not require the substantial expansion of existing police facilities or the construction of new police facilities. The WRPs treat wastewater and are not facilities that require regular police services. Plant expansion at the SJCWRP would involve the continued treatment of wastewater and, therefore, would not increase the need for police services. Process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would include underground storage tanks of wastewater and, therefore, would not increase the need for police services. WRP effluent management

would continue to release volumes of treated effluent from the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP into receiving waters and, therefore, would not need expanded police services. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level

Construction and operation at the JWPCP would not require the substantial expansion of existing police facilities or the construction of new police facilities. The existing solids processing digesters do not require regular police services; the new digesters would be similar to the existing ones. The operation of biosolids management would consist of an increase in truck trips to transport the biosolids from the JWPCP to existing biosolids use facilities or land application facilities. An increase in truck trips would not require additional police services. Impacts would be less than significant and will not be addressed in the EIR/EIS at the program level

**PS-3. Overall Determination: No Impact.** Construction and operation of all program elements would not generate new students or adversely impact any school facilities necessitating the building of new schools. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Typically, the need for increased school services, such as new buildings, is associated with land uses and activities that result in an increase in population and, specifically, an increase in the population of school-age children (e.g., subdivisions). Construction and operation of the program elements would not be associated with an increase in population of school-age children. Furthermore, the inherent nature of the uses of each program element is that of wastewater conveyance and treatment, and these uses typically do not generate a need for school services. School districts were contacted in each of the jurisdictions of the program facilities to confirm whether there was a need for expanded services associated with the program. The responses from school districts can be found in Appendix 16-A of the EIR/EIS, and they indicate that the program elements do not create a need for increased school services. Therefore, construction and operation of the program elements would not result in the substantial expansion of existing school facilities or the construction of new school facilities; impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**PS-4. Overall Determination: No Impact.** Construction and operation of all program elements would not require the substantial expansion of existing parks and/or recreation opportunities or require the building of new recreation facilities. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Typically, the need for increased parks and recreational services is associated with land uses and activities that result in an increase in population (e.g., subdivisions). Construction and operation of the program elements would not be directly associated with an increase in population. Furthermore, the inherent nature of the uses of each program element is that of wastewater conveyance and treatment, and these uses typically do not generate a need for parks or recreational services. Therefore, construction and operation of the program elements would not result in the substantial expansion of existing park or recreational facilities or the construction of new park or recreational facilities; impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**PS-5. Overall Determination: Potentially Significant Impact.** Construction of some program elements could impair implementation of or physically interfere with an existing emergency response or emergency preparedness plan or emergency evacuation plan, or require the preparation of a new emergency response or preparedness plan. Therefore, construction impacts related to these specific program elements would be potentially significant, and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The conveyance system is currently underground and conveys wastewater to the WRPs and JWPCP for treatment and is generally located within the public rights-of-way of roads. During construction, traffic plans may be required to control traffic and re-route traffic; however, these types of traffic plans are typical of utilities located in existing public rights-of-way. Once operational, the conveyance system would be located underground and would not have the ability to impair or conflict with an emergency preparedness plan. Therefore, construction and operation of the conveyance improvements would not impair the implementation of or physically interfere with an existing emergency response or emergency preparedness plans; impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** Construction of plant expansion at the SJCWRP; process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP; and solids processing facilities at the JWPCP could result in activities that could physically interfere with the implementation of an emergency preparedness plan; therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level. Once the elements at these WRPs and the JWPCP are operational (including WRP effluent management), the conveyance of wastewater through the system, the discharge of recycled water, and the processing of solids, would not require additional employees or require new emergency preparedness plans. Furthermore, the program elements would be located within the footprint of existing facilities and, therefore, would not physically interfere with emergency preparedness plans. Additional truck trips related to biosolids management are small (about 20 additional daily truck trips from the JWPCP), and these trucks would follow existing designated truck routes. Therefore, the small number of trucks would not impair implementation of or physically interfere with an existing emergency preparedness plan. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

## Public Services Project Discussion

**PS-1. Overall Determination: No Impact.** Construction and operation of all project elements would not require the substantial expansion of existing fire protection facilities or the construction of new fire protection facilities to maintain an acceptable level of service. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** Typically, the need for increased fire services is either associated with an increase in population or an increase in uses or activities that require fire services because of their inherent nature (e.g., oil storage terminals). Construction and operation of the project elements would not be associated with an increase in population. Furthermore, as discussed below, the inherent nature of the uses of each project element is that of supporting wastewater treatment or discharging treated wastewater, and these uses typically do not generate a need for fire services. Fire services were contacted in each of the jurisdictions of the project facilities to confirm whether there was a need for expanded services associated with the project. Responses from fire services can be found in Appendix 16-A of the EIR/EIS, and they indicate that the project elements do not create a need for increased fire services. Therefore, construction and operation of the project elements would not result in the substantial expansion of existing fire protection facilities or the construction of new fire protection facilities; impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**PS-2. Overall Determination: No Impact.** Construction and operation of all project elements would not require the substantial expansion of existing police service facilities or the construction of new police service facilities to maintain an acceptable level of service. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** Typically, the need for increased police services is either associated with an increase in population or an increase in uses or activities that require police services because of their inherent nature (e.g., correctional facilities or prisons). Construction and operation of the project elements would not be associated with an increase in population. Furthermore, the inherent nature of the uses of each project element is that of supporting wastewater treatment or discharging treated wastewater, and these uses typically do not generate a need for police services. Police services were contacted in each of the jurisdictions of the project facilities to confirm whether there was a need for expanded services associated with the project. The responses from police services can be found in Appendix 16-A of the EIR/EIS, and they indicate that the project elements do not create a need for increased police services.

Therefore, construction and operation of the project elements would not result in the substantial expansion of existing police facilities or the construction of new police facilities; impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**PS-3. Overall Determination: No Impact.** Construction and operation of all project elements would not require the substantial expansion of existing school facilities or require the building of new facilities. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** Typically, the need for increased school services, such as new buildings, is associated with land uses and activities that result in an increase in population and, specifically, an increase in the population of school-age children (e.g., subdivisions). Construction and operation of the project elements would not be associated with an increase in population of school-age children. Furthermore, the project elements would not generate new students or adversely impact any school facilities necessitating the building of new schools. School districts were contacted in each of the jurisdictions of the project elements to confirm whether there was a need for expanded services associated with the project. The responses from school districts can be found in Appendix 16-A of the EIR/EIS, and they indicate that the project elements do not create a need for increased school services. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**PS-4. Overall Determination: Less Than Significant Impact.** Construction and operation of the project elements would not require the substantial expansion of existing parks and/or recreation opportunities or require the building of new recreation facilities. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** Typically, the need for increased parks and recreational services is associated with land uses and activities that result in an increase in population (e.g., subdivisions). Construction and operation of the project elements would not be associated with an increase in population. Furthermore, the inherent nature of the uses of each project element is that of supporting wastewater treatment and discharging treated wastewater, and these uses does not generate a need for parks or recreational services. (For specific impacts on Angels Gate, Point Fermin, and Royal Palms [existing recreational areas and parks] associated with construction at the Royal Palms shaft site and the Angels Gate shaft site, see

Recreation Section XV.) Therefore, impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

**PS-5. Overall Determination: Potentially Significant Impact.** Construction of the project elements could impair implementation of or physically interfere with an existing emergency response or emergency preparedness plan or emergency evacuation plan or require the preparation of a new emergency response or preparedness plan. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**All Project Elements.** Construction of the project elements could result in activities that could physically interfere with the implementation of an emergency preparedness plan; therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Once operational, the project elements would be located in the subsurface with minimal aboveground facilities located within existing developed areas. Therefore, operation of all project elements would result in no impacts and will not be addressed in the EIR/EIS at the project level.

## Recreation Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XV.** | **RECREATION.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| REC-1. | Result in a substantial loss or diminished quality of recreational, educational, or visitor-oriented opportunities, facilities, or resources? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| REC-2. | Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☒ | ☒ | ☐ | ☐ |
| REC-3. | Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |

## Recreation Program Discussion

**REC-1. Overall Determination: Potentially Significant Impact.** Construction of process optimization at the LCWRP could result in the diminished quality of recreational opportunities. Therefore, construction impacts related to this specific program element would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

Recreational opportunities related to WRP Effluent Management are discussed in Hydrology, Water Quality (Freshwater), and Public Health Section IX of this appendix or Chapter 11 within the context of designated beneficial uses for the receiving waters.

**Conveyance System.** The construction of the conveyance improvements would generally occur within the public streets rights-of-way and, therefore, may occur near to or adjacent to recreational, educational, or visitor-oriented opportunities. However, construction and maintenance activities related to utilities within the public rights-of-way are typical. Furthermore, since the construction would be temporary and short in duration, any effect from construction to the recreational opportunity would be restored upon construction completion. Construction of the conveyance improvements would not substantially reduce or diminish the quality of recreational, educational, or visitor-oriented opportunities; therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the program level. Once operational, the conveyance system would be located underground and would not substantially diminish the quality of recreational, educational, or visitor-oriented opportunities, facilities, or resources. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Some recreational resources are located within the general vicinity of several WRPs. A golf course is located to the north/northeast across the San Jose Creek from the SJCWRP. Elephant Hill, an open space recreational area, is located to the west/southwest of the POWRP. El Dorado Park, an open space recreational area, and El Dorado Park Golf Course are located to the north and west, respectively, of the LBWRP. The San Gabriel River separates the LBWRP from the golf course, and Willow Street separates the LBWRP from the park. Whittier Narrows Recreation Area is located to the north of the WNWRP and Legg Lake is located to the east across from Rosemead Boulevard. Finally, part of Iron-Wood Nine Golf Course is located within the boundaries of the LCWRP.

Construction and operation of the plant expansion and process optimization at the SJCWRP would not diminish the quality of the golf course. The golf course is not directly adjacent to the SJCWRP and is separated from the WRP by the San Jose Creek. Construction and operation of the plant expansion would take place along the west/northwestern side of the SJCWRP, adjacent to the San Gabriel River and away from the golf course. Construction of process optimization would take place in an existing parking lot of the SJCWRP and would be separated from the golf course by more than 250 feet and San Jose Creek. Therefore, the construction of plant expansion and process optimization at the SJCWRP would be physically separated from the golf course so as not to diminish the golfing experience. Once operational, the majority of the process optimization facilities would exist underground and the surface would be returned to an existing parking lot. Therefore, construction and operational impacts associated with improvements at the SJCWRP would not result in a substantial loss or diminished quality of recreational

opportunities or resources. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

Construction and operation of process optimization at the POWRP would not diminish the quality of the existing recreational opportunities within the general vicinity of this WRP. Construction of process optimization would occur in the center of the POWRP and approximately 75 feet from the nearest edge of Elephant Hill. Elephant Hill is a large open space area, and there are no special features or amenities directly adjacent to the process optimization construction area. Visitors to Elephant Hill could move away from or enjoy the remaining area of Elephant Hill should construction of process optimization at the POWRP inhibit their enjoyment. Construction impacts of process optimization at POWRP would be less than significant and will not be addressed in the EIR/EIS at the program level. Once operational, the majority of the process optimization facilities would be located underground and the surface would be returned to its existing condition of vacant lot/wastewater support facilities. Therefore, operational impacts associated with process optimization at the POWRP would not occur and will not be addressed in the EIR/EIS at the program level.

Construction and operation of process optimization at the LBWRP would not diminish the quality of the existing recreational opportunities within the general vicinity of this WRP. Construction of process optimization at the LBWRP would be located south of the existing Leo J. Vander Lans Advanced Water Treatment Facility and north of the LBWRP existing wastewater treatment facilities. This construction would be located more than 500 feet from El Dorado Park and El Dorado Park Golf Course. Furthermore, San Gabriel River and Willow Street both separate these two recreational areas from the construction area. Finally, the park is open space and there are no special amenities located on southern edge adjacent to Willow Street. Therefore, users of the park could move away from the construction to other areas of park should the construction inhibit users enjoyment of the park. The golf course only has a few holes adjacent to the San Gabriel River, west of the construction area. The very nature of golf allows players to move through the course and not remain at one hole. Therefore, players would move from these holes and not remain stationary for long periods should the construction inhibit their enjoyment of the golf course. Therefore, construction of process optimization would not substantially diminish the quality of the park or golf course due to the distance and the separation by the river and the street and the availability of other areas of the park and golf course open to users. Construction impacts of process optimization at LBWRP would be less than significant and will not be addressed in the EIR/EIS at the program level. Once operational, the majority of the process optimization facilities would be located underground and the surface would be returned to its existing condition of vacant disturbed soil. Therefore, operational impacts of process optimization at the LBWRP would not occur and will not be addressed in the EIR/EIS at the program level.

Construction of process optimization at the LCWRP could result in a disruption of the existing Iron-Wood Nine Golf Course driving range. The proposed location for the underground storage tank is beneath a portion of the existing driving range. Therefore, construction of the process optimization could result in a substantial loss or diminished quality of the driving range. Construction impacts of process optimization at the LCWRP would be potentially significant and will be addressed in the EIR/EIS at the program level. Once operational, the majority of the process optimization facilities would be located underground and the surface of the driving range would be returned to its existing conditions. Therefore, operational impacts of process optimization at the LCWRP would not occur and will not be addressed in the EIR/EIS at the program level.

WRP effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP would result in a change in volume of discharged water into the existing water bodies; however, this change would not substantially diminish the quality of recreational opportunities or resources. Some of the receiving waters

have designated beneficial uses of recreation under the Clean Water Act. However, much of the recreation is restricted by Los Angeles County Department of Public Works (by restricted access to the receiving waters) or may be reviewed by SWRCB. Furthermore, the current primary function is specifically to be maintained for flood and drainage purposes during wet and dry flows. Therefore, impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** There are no recreational facilities within the general vicinity of the improvement locations at the JWPCP. Furthermore, the construction and operation of solids processing facilities and the operation of biosolids management would be located within the interior of the JWPCP. Therefore, construction and operation of solids processing facilities and operation of biosolids management at the JWPCP would not have an impact on recreational opportunities and will not be addressed in the EIR/EIS at the program level.

Once the biosolids are transported from the JWPCP, they are beneficially used at existing locations, land filled, or applied to agricultural land. The increase in biosolids at the JWPCP to be beneficially used or disposed of would not diminish the quality of recreational opportunities or resources. The land applications and beneficial use locations are generally located in areas dominated by agriculture or in light industrial/commercial areas and, generally, recreational resources would not be located within close proximity to these existing uses. The actual land use application or beneficial use would occur on existing agricultural land or in existing beneficial use buildings. The Sanitation Districts would only use sites that are properly permitted and for which all site-specific impacts, including impacts on offsite recreational resources, have been mitigated thoroughly through either preparation of site-specific environmental documents or compliance with other federal, state, and local regulations. Therefore, operational impacts associated with biosolids management on recreational opportunities would not occur and will not be addressed in the EIR/EIS at the program level.

**REC-2. Overall Determination: No Impact.** Construction and operation of all program elements would not increase the use of existing neighborhood and regional parks. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** The construction and operation of all program elements would not result in an increase in use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Construction and operation of improvements under the program would generally occur within existing public rights-of-way or would occur within the footprint of the WRPs and JWPCP, with the exception of WRP effluent management, and would not extend into areas surrounding the facilities. WRP effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP would result in a change in volume of discharged water into the existing water bodies; however, this change would not substantially diminish the quality of recreational opportunities or resources at neighborhood or regional parks. Furthermore, as previously discussed, once the biosolids are transported from the JWPCP, they are beneficially used at existing locations, land filled, or applied to agricultural land. The actual land use application or beneficial use would occur on existing agricultural land or in existing beneficial use buildings. Therefore,

construction and operational impacts for all program elements to existing neighborhood and regional parks would not occur and will not be addressed in the EIR/EIS at the program level.

**REC-3. Overall Determination: No Impact.** Construction and operation of all program elements would not include recreational facilities or require the construction of new recreational facilities. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Construction and operation of program elements do not include recreational facilities. See REC-1 (Program) for information about existing recreational opportunities. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

## Recreation Project Discussion

**REC-1. Overall Determination: Potentially Significant Impact.** Construction at the JWPCP West, Angels Gate, and Royal Palms shaft sites could result in a diminished quality of recreational opportunities. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Recreational opportunities and the riser/diffuser areas are discussed in Marine Environment Section XI within the context of designated beneficial uses for the Pacific Ocean and the coastal area.

**Tunnel Alignments – Onshore and Offshore.** Construction and operation of the onshore and offshore tunnels would occur below the ground surface and below the seafloor. There are no recreational opportunities at these depths. Therefore, the construction and operation of the onshore and offshore tunnels would not substantially diminish the quality of recreational opportunities or resources. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East, TraPac, LAXT, and Southwest Marine.** There are no recreational facilities adjacent or in proximity to the JWPCP East, LAXT, and Southwest Marine shaft sites. The LAXT and Southwest Marine shaft sites are located within the Port of Los Angeles on Terminal Island and are removed from all recreational locations at the port. The JWPCP East shaft site is surrounded by residential homes, retail, and commercial uses and does not have any recreational uses adjacent or within proximity to it. Therefore, construction and operation at these shaft sites would not substantially diminish

recreational opportunities or resources. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

Directly across from the TraPac terminal is the designated Harry Bridges Boulevard Buffer, which will be a future park area for the residents of Wilmington. The buffer will include a 30- to 40-foot tall earthen berm along Harry Bridges Boulevard to buffer Wilmington residents and park users from the noise generated by activities at the TraPac container terminal and from trucks traveling on Harry Bridges Boulevard. Currently, the Harry Bridges Boulevard Buffer is under construction. TraPac specifically is a container terminal that stores hundreds of stacked containers removed from cargo ships. These containers can be stacked as high as several stories (assuming each container is approximately 10 feet in height). The construction at the TraPac shaft site would occur behind the containers, effectively shielding the buffer from noise or other construction activities. Furthermore, the berm associated with the buffer would shield users of the buffer from shaft construction. Once constructed, the TraPac shaft site could have low-profile aboveground facilities associated with it, such as access hatches. These would remain screened from view by the containers. Therefore, construction and operation at the TraPac shaft site would not substantially diminish existing recreational opportunities. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP West, Angels Gate, and Royal Palms.** The JWPCP West shaft site would be located at the corner of West Lomita and Figueroa Street. Immediately across Figueroa Street is the Wilmington Athletic Complex, which includes soccer fields and baseball fields. The noise barrier surrounding the shaft site would not necessarily prevent noise, light, and glare impacts on users of the Wilmington Athletic Field. Therefore, construction impacts associated with the JWPCP West shaft site would be potentially significant on the Wilmington Athletic Field and will be addressed in the EIR/EIS at the project level. Once operational, the shaft site could have permanent facilities such as a three-story surge tower and a pumping plant, which are consistent with the type of facilities already at the JWPCP. Therefore, operation at the JWPCP West shaft site would not have an impact on the Wilmington Athletic Complex. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

Construction at the Angels Gate and Royal Palms shaft sites has the potential to result in a substantial loss or diminished quality of recreational, educational, or visitor-oriented opportunities, facilities, or resources. Angels Gate and Royal Palms Beach are two designated recreational areas of the city of Los Angeles. Construction at these areas would occur over a number of years and could reduce the quality of the existing recreational experience at these two locations due to noise, vibration, and traffic. Therefore, construction at the Angels Gate and Royal Palms shaft sites could substantially diminish the quality of recreational resources at these locations. Construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Operation at the Angels Gate or Royal Palms shaft sites would not have an impact on recreational, educational, or visitor-oriented facilities or resources. The shaft would be converted into a smaller belowground access structure that would be connected to the tunnel. Any aboveground facilities at the Royal Palms shaft site would exist in the same location as the current facilities. Therefore, these facilities would not inhibit the use of Angels Gate Park or Royal Palms Beach. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**REC-2. Overall Determination: Potentially Significant Impact.** Construction at the JWPCP West, Angels Gate, and Royal Palms shaft sites could result in the increased use of existing neighborhood and regional parks. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

Recreational opportunities associated with the riser/diffuser areas are discussed in Marine Environment Section XI within the context of designated beneficial uses for the Pacific Ocean and the coastal area

**Tunnel Alignments – Onshore and Offshore.** See REC-1 (Project) for construction and operation details. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP East, TraPac, LAXT, and Southwest Marine.** See REC-1 (Project) for construction and operation details. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**Shaft Sites – JWPCP West, Angels Gate, and Royal Palms.** See REC-1 (Project) for construction details. The presence of construction activities near the Wilmington Athletic Complex, the Angels Gate Park, and the Royal Palms Beach may shift use away from those areas during the construction period and increase the use of other recreational areas. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. See REC-1 (Project) for operation details. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**REC-3. Overall Determination: No Impact.** Construction and operation of all project elements would not include recreational facilities or require the expansion of existing facilities. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** The construction and operation of all project elements do not include the development of recreational facilities or require the expansion of existing facilities. Use may temporarily shift away from certain facilities during construction (e.g., Angels Gate or Royal Palms), but this temporary shift would not require the construction of new facilities elsewhere due to the availability of other areas of the coastline for recreational enjoyment. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Transportation and Traffic (Terrestrial) Checklist

| | Program | | | Project | | |
|---|---|---|---|---|---|---|
| **XVI. TRANSPORTATION AND TRAFFIC (TERRESTRIAL).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| TRT-1. Conflict with an applicable plan, ordinance, or policy establishing a measure of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant elements of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| TRT-2. Conflict with an applicable congestion management program, including, but not limited to level of service standards established by the county congestion management agency for designated roads or highways? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| TRT-3. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| TRT-4. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

| | Program | | | Project | | |
|---|---|---|---|---|---|---|
| **XVI. TRANSPORTATION AND TRAFFIC (TERRESTRIAL).** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| TRT-5. Result in inadequate emergency access? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| TRT-6. Conflict with adopted policies, plans, or programs regarding public transit, bikeways, or pedestrian facilities, or otherwise substantially decrease the performance of safety of such facilities? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Transportation and Traffic (Terrestrial) Program Discussion

**TRT-1, TRT-2, TRT-4, TRT-5, and TRT-6. Overall Determination: Potentially Significant Impact.** Construction and operation of several program elements could exceed thresholds related to traffic. Therefore, construction and operational impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | X |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | X |
| JWPCP – Biosolids Management | N/A | X |

**All Program Elements (Except WRP Effluent Management).** Construction of all program elements except WRP effluent management (which is discussed below and does not include construction) has the potential to impact traffic and exceed traffic and transportation thresholds. Therefore, construction activities for Thresholds TRT-1, TRT-2, and TRT-4 through TRT-6 will be evaluated for all program elements in the EIR/EIS at the program level. Operation of the program elements may also affect transportation and circulation. For example, construction- and operation-related activities resulting from solids processing and the operation of biosolids management at the JWPCP could conflict with an applicable congestion management program, including, but not limited to, level-of-service standards established by the county congestion management agency for designated roads or highways. According to the city of Carson guidelines, a detailed traffic study must be prepared if the project adds 50 or more new trips to and from the site during a peak hour. Biosolids truck trips from the JWPCP are anticipated to increase. Therefore, construction and operational impacts would be potentially significant and will be addressed in the EIR/EIS at the program level. Therefore, the traffic analysis will evaluate construction and operational activities for all program elements (except WRP effluent management as discussed below) for Thresholds TRT-1, TRT-2, and TRT-4 through TRT-6 in the EIR/EIS at a program level.

**WRP (Effluent Management).** WRP effluent management would include a change in the volume of treated effluent discharged from the WRPs. The very nature of discharging treated effluent does not generate traffic and cannot have an impact on traffic. Therefore, the operation of WRP effluent management would not impact traffic or circulation and will not be addressed in the EIR/EIS at the program level.

**TRT-3. Overall Determination: No Impact.** Construction and operation of all program elements would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** See LU-3 (Program), for details regarding public airports and private airstrips. Construction and operational impacts would not occur; therefore, this issue will not be addressed in the EIR/EIS at the program level.

## Transportation and Traffic (Terrestrial) Project Discussion

**TRT-1, TRT-2, TRT-4, TRT-5, and TRT-6. Overall Determination: Potentially Significant Impact.** Construction and operation of all project elements could generate traffic levels that could exceed traffic related thresholds. Therefore, construction and operational impacts related to all project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** Construction of all project elements has the potential to generate traffic that could exceed thresholds. Therefore, construction activities for all project elements for Thresholds TRT-1, TRT-2, TRT-4, TRT-5, and TRT-6 will be evaluated in the EIR/EIS at a project level. Operation of the project is unlikely to generate traffic that could exceed thresholds because once operational, treated effluent would be conveyed belowground and discharged to the Pacific Ocean. However, operational activities for all thresholds for all project elements will be evaluated in the EIR/EIS at a project level.

**TRT-3. Overall Determination: No Impact.** Construction and operation of all project elements would not result in a change in air traffic patterns. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** See LU-3 (Project) for details regarding public airports and private airstrips. Construction and operation of all project elements would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. Construction and operational impacts would not occur; therefore, this issue will not be addressed in the EIR/EIS at the project level.

## Transportation and Traffic (Marine) Checklist

| | | Program (marine transportation and traffic thresholds are not applicable to the program elements*) | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XVII.** | **TRANSPORTATION AND TRAFFIC (MARINE).** Would the project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| TRM-1. | Interfere with the operation of designated vessel traffic lanes entering and exiting the Port of Los Angeles? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |
| TRM-2. | Impair the level of safety for vessels navigating the Main Channel or West Basin areas within the Port of Los Angeles, or precautionary areas outside the Port of Los Angeles? | ☐ | ☐ | ☐ | ☒ | ☐ | ☐ |

*The program elements would not be located in the marine environment. All program elements would be constructed and operated on land. Therefore, none of the Transportation-Traffic Marine thresholds apply to the program elements and marine transportation impacts will not be addressed in the EIR/EIS at the program level.

## Transportation and Traffic (Marine) Project Discussion

The only project elements that would be located in the marine environment and could have an impact on marine transportation and traffic are:

- The offshore tunnel alignments
- The riser and diffuser on either the PV Shelf or the SP Shelf
- The existing ocean outfalls

The construction and operation of all other project elements would occur on land and would not have an impact on marine transportation and traffic. Therefore, the marine transportation and traffic thresholds only apply to the offshore tunnel alignments, the riser and diffuser areas, and the existing ocean outfalls; all other project elements will not be addressed in this section or in the EIR/EIS.

**TRM-1. Overall Determination: Potentially Significant Impact.** Construction of the offshore tunnels and at all the riser and diffuser areas could interfere with the operation of designated vessel lanes entering and exiting the Port of Los Angeles. Additionally, operation of the SP Shelf riser and diffuser could interfere with the operation of designated vessel lanes. Therefore, construction and operational impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | X | – |

**Tunnel Alignments – Offshore.** Non-hazardous material excavated from construction of the offshore tunnel could potentially be loaded onto barges at a location within the Port of Los Angeles where it would then be transported to the LA-2 or LA-3 ocean disposal site. This would create additional marine vessel activity and traffic within the Port of Los Angeles and has the potential to interfere with the operation of designated vessel traffic lanes entering and exiting the Port of Los Angeles. Therefore, construction impacts would be potentially significant, and will be addressed in the EIR/EIS at the project level. Once the offshore tunnel is operational, it would be located below the surface of the ocean and would not require any additional vessel traffic. Therefore, operation of the offshore tunnel would not interfere with the operation of designated vessel traffic lanes entering and exiting the Port of Los Angeles and impacts would not occur; this issue will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** Construction activities at the riser/diffuser areas have the potential to interfere with the operation of designated vessel traffic lanes entering and exiting the Port of Los Angeles. The construction of the new riser and diffuser on either the PV Shelf or SP Shelf would require the construction and operation of a construction platform, similar to those used for oil exploration in the ocean. Barges may also be anchored to the platform. The rehabilitation of the existing ocean outfalls would require the use of multiple barges, and may require some type of ocean surface platform. These construction structures and barges could interfere with the operation of designated vessel traffic lanes entering and exiting the Port of Los Angeles. Therefore, construction impacts at the riser/diffuser areas would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational the construction platform and multiple barges would be removed from all of the riser/diffuser areas. Barges and ships would only be used for periodic maintenance purposes and would not remain in one place for extended durations. Currently, the existing ocean outfalls are periodically maintained and, therefore, any maintenance of the existing ocean outfalls after rehabilitation would be no different than the existing conditions. Operational impacts associated with the rehabilitated existing ocean outfalls would not occur and will not be addressed in the EIR/EIS at the project level.

Periodic maintenance activities associated with a riser and diffuser on either the SP Shelf or on the PV Shelf would be the same as those of the existing ocean outfalls. However, although similar in nature to maintenance of the existing ocean outfalls, the operation of a new riser and diffuser on the SP Shelf has the potential to interfere with marine transportation and traffic due to the proximity of the riser and diffuser area to the marine vessel travel lanes. Therefore, operation of a new riser and diffuser on the SP Shelf would be potentially significant and will be addressed in the EIR/EIS at the project level.

Operation of a riser and diffuser on the PV Shelf would not have the potential to interfere with marine transportation and traffic because any periodic maintenance activities would occur outside the designated vessel lanes. Therefore, operation of a new riser and diffuser on the PV Shelf would not interfere with the operation of the designated vessel traffic lanes and will not be addressed in the EIR/EIS at the project level.

**TRM-2. Overall Determination: Potentially Significant Impact.** Construction of the offshore tunnel and at the SP and PV Shelf riser and diffuser areas could impair the level of safety for vessels navigating in the Port of Los Angeles or precautionary areas outside the port. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | N/A | N/A |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | N/A | N/A |
| Shaft Site – JWPCP East | N/A | N/A | Shaft Site – Royal Palms | N/A | N/A |
| Shaft Site – JWPCP West | N/A | N/A | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | N/A | N/A | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | N/A | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Offshore.** Non-hazardous material excavated from the offshore tunnel alignments could potentially be loaded onto barges at a location within the Port of Los Angeles where it would then be transported to the LA-2 or LA-3 ocean disposal site. This would create additional marine vessel activity and traffic within the Port of Los Angeles and has the potential to impair the level of safety for vessels entering and exiting the Port of Los Angeles. Therefore, construction impacts would be potentially significant, and this issue will be addressed in the EIR/EIS at the project level. Once the offshore tunnel is operational, it would be located below the surface of the ocean and would not require any additional vessel traffic. Therefore, operation of the offshore tunnel would not impair the level of safety for vessels and impacts would not occur; this issue will not be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – San Pedro Shelf and Palos Verdes Shelf.** The construction of a new riser and diffuser on the PV Shelf or SP Shelf has the potential to impair the level of safety for vessels navigating the Main Channel, West Basin area, or precautionary areas. Construction of a new riser and diffuser would involve assembly of diffuser sections at the Port of Los Angeles and then towing the assembled diffuser sections to the offshore riser and diffuser area. The diffuser sections could be a significant

length, requiring careful maneuvering through the Port of Los Angeles. Therefore, construction impacts of a new riser and diffuser on either the SP Shelf or the PV Shelf would be potentially significant and will be addressed in the EIR/EIS at the project level.

Operation of a new riser and diffuser on either the SP Shelf or the PV Shelf would have no impact on the safety of vessels. As discussed previously, once the new riser and diffuser are operating, they would only require periodic maintenance. The vessels that would be used for this maintenance are similar to vessels that regularly use the Port of Los Angeles under existing conditions and would not substantially increase or impair the safety of vessel traffic entering and leaving the port. Therefore, operation of a new riser and diffuser would have no impact and will not be addressed in the EIR/EIS at the project level.

**Riser/Diffuser Area – Existing Ocean Outfalls.** Rehabilitation of the existing ocean outfalls would not impair the level of safety for vessels. Construction barges and ships would leave from and return to the Port of Los Angeles en route to the existing ocean outfall location; however, these vessels would be similar to those that regularly use the Port of Los Angeles under existing conditions. Therefore, construction impacts would be less than significant and will not be addressed in the EIR/EIS at the project level. As previously discussed, once the rehabilitated existing ocean outfalls are operating, they would only require periodic maintenance as under existing conditions. Therefore, operation of the rehabilitated existing ocean outfalls would not change from existing conditions and there would be no impact. This issue will not be addressed in the EIR/EIS at the project level.

## Utilities and Service Systems and Energy Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XVIII.** | **UTILITIES AND SERVICE SYSTEMS AND ENERGY.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| UTL-1. | Exceed wastewater treatment requirements of the applicable regional water quality control board? | ☐ | ☒ | ☐ | ☐ | ☐ | ☒ |
| UTL-2. | Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| UTL-3. | Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| UTL-4. | Require new or expanded entitlements because sufficient water supplies would not be available to serve the project? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |
| UTL-5. | Result in the disruption or impediment of utility service to areas during construction? | ☐ | ☒ | ☐ | ☐ | ☒ | ☐ |
| UTL-6. | Be served by landfill(s) with insufficient permitted capacity to accommodate the project's solid waste disposal needs during construction and operation? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XVIII.** | **UTILITIES AND SERVICE SYSTEMS AND ENERGY.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| UTL-7. | Be in noncompliance with federal, state, and local statutes and regulations related to solid waste? | ☐ | ☐ | ☒ | ☐ | ☐ | ☒ |
| UTL-8. | Require new, offsite energy supply and distribution infrastructure or capacity-enhancing alterations to existing facilities that are not anticipated by adopted plans or programs? | ☐ | ☒ | ☐ | ☒ | ☐ | ☐ |

## Utilities and Service Systems and Energy Program Discussion

**UTL-1. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not exceed wastewater treatment requirements of the applicable regional water quality control board. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** Construction and operation of the improvements to the conveyance system would facilitate the conveyance of wastewater via gravity to the WRPs and JWPCP for treatment. The improvements to the conveyance system could accept additional volumes of wastewater; however, the additional volume of wastewater would be treated under the current permitted capacity of the POWRP, LBWRP, LCWRP, WNWRP and JWPCP (for SJCWRP see below). Therefore, the construction and operation of the conveyance improvements would not exceed wastewater treatment requirements. Construction and operational impacts associated with the conveyance system would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** SJCWRP would expand by 25 MGD for a total capacity of 125 MGD. This is the only WRP expansion proposed. The increase in permitted capacity would require the Sanitation Districts to apply for a new wastewater permit from the Los Angeles RWQCB. This permit would require wastewater treatment levels and criteria for the SJCWRP to continue to be met, as they currently are. Therefore, plant expansion at the SJCWRP would not exceed wastewater treatment requirements of the applicable RWQCB permits. Construction and operational impacts associated with plant expansion at the SJCWRP would be less than significant, and this issue will not be addressed in the EIR/EIS at the program level.

The other WRPs would maintain their permitted capacities and would not treat additional wastewater. Process optimization would not change the capacity of the WRPs but rather normalize the flows through the WRPs to more efficiently treat the wastewater and discharge or recycle the treated effluent. Therefore, impacts would not occur under the construction and operation of process optimization at all of the WRPs and will not be addressed in the EIR/EIS at the program level.

WRP effluent management would continue to discharge treated effluent into existing receiving waters. Any change in volume of this discharge would not result in an exceedence of wastewater treatment requirements since the discharge is regulated through the permits granted by the RWQCB to each WRP. Therefore, operation of WRP effluent management would not result in an exceedence of wastewater treatment requirements and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction and operation of solids processing facilities and operation of biosolids management at the JWPCP would not result in an exceedence of wastewater treatment requirements of the applicable RWQCB. The increase in solids processing would not increase the volume of secondary treated effluent from the JWPCP. The JWPCP would continue to operate within its permitted discharge requirement of 400 MGD. However, the increase in solids processing would increase biosolids management. This increase would require additional trucks to transport the biosolids off site for beneficial use, landfill, or land application. This increase in biosolids would not exceed wastewater

treatment requirements. The actual land use application or beneficial use would occur on existing agricultural land or in existing beneficial use buildings. The Sanitation Districts would only use sites that are properly permitted and for which all site-specific impacts, including exceeding wastewater treatment requirements, have been mitigated thoroughly through either preparation of site-specific environmental documents or compliance with other federal, state, and local regulations. Therefore, impacts associated with construction and operation of solids processing facilities and the operation of biosolids management would be less than significant and will not be addressed in the EIR/EIS at the program level.

**UTL-2. Overall Determination: No Impact.** Construction and operation of all program elements would not result in the construction of new water or wastewater treatment facilities, the construction of which could cause significant environmental effects. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** All program elements include the construction of new or improvements to wastewater treatment facilities. Potential significant impacts associated with the construction and operation of all program elements are discussed in the applicable resource sections of this Preliminary Screening Analysis (e.g., cultural resources, hazards and hazardous materials, air quality, noise, etc.). Any impact deemed potentially significant in this Preliminary Screening Analysis will be further addressed in the EIR/EIS. Because the potentially significant impacts of the program elements (e.g., wastewater treatment facilities) are being evaluated in their respective resource sections, this issue will not be addressed in the EIR/EIS at the program level.

**UTL-3. Overall Determination: Potentially Significant Impact.** Construction of all program elements could increase the amount of runoff. Therefore, construction impacts related to these specific program elements would be potentially significant and will be addressed in the EIR/EIS at the program level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | – |
| SJCWRP – Plant Expansion | X | – |
| WRP – Process Optimization | X | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | X | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The generation of stormwater runoff is affected by a change in the amount of impervious (e.g., roads, sidewalks, gutters) or pervious (e.g., lawns, parks, natural open space) surfaces in a location. Exposed soils during construction can generate more stormwater runoff when compared to existing conditions, as can a substantial reduction in pervious surfaces due to an increase in the amount of impervious surfaces (e.g., converting a park to a parking structure). Construction and operation of the conveyance improvements would occur in the existing public rights-of-way of streets. During construction, runoff could be generated as discussed in HYD-7 (Program). Therefore, construction of the conveyance improvements would have potentially significant impacts and will be addressed in the EIR/EIS at the program level. Operation would not substantially increase impervious surfaces over the

current existing impervious surface conditions. Therefore, operation would not generate new or large volumes of stormwater requiring the construction of new stormwater drainage facilities, and impacts would not occur. Therefore, operational impacts will not be addressed in the EIR/EIS at the program level.

**WRPs.** The program includes plant expansion at the SJCWRP and process optimization at the SJCWRP, LCWRP, POWRP, and LBWRP within the existing footprint of these facilities. Construction would likely not need new stormwater drainage facilities but would require management plans to control any stormwater generated by the program construction sites as required under NPDES. This issue is discussed in more detail in HYD-7 (Program). Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the program level.

Once construction is complete, the site surface for the plant expansion at the SJCWRP and process optimization at the SJCWRP, LCWRP, POWRP, and LBWRP would return to existing conditions. In general, the improvements to the WRPs would not substantially increase impervious surfaces at the WRPs and, therefore, would not result in a substantial increase in stormwater runoff. The operation of the improvements to the WRPs would utilize existing stormwater drainage facilities and would not require the construction of new facilities. Therefore, operational impacts associated with the improvements to the WRPs would be less than significant and will not be addressed in the EIR/EIS at the program level.

WRP effluent management would continue to discharge tertiary treated effluent into existing receiving waters. Any change in volume of this discharge would not result in the construction of new stormwater drainage facilities. The existing receiving waters primarily act as flood control channels, and are maintained and operated to receive stormwater runoff, as well as the discharge from the WRPs. Therefore, operation of WRP effluent management would not result in the need for new stormwater drainage facilities and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction of the solids processing digesters would likely not require new stormwater drainage facilities but would require management plans to control any stormwater generated by the program construction sites as required under NPDES (see HYD-7 [Program]). Therefore, construction impacts associated with the solids processing digesters would be potentially significant and will be addressed in the EIR/EIS at the program level. The new solids processing digesters would operate on existing impervious surfaces. Furthermore, operation of the solids processing digesters would utilize existing stormwater drainage facilities and would not require the construction of new facilities. Because the operation of the solids processing digesters would not substantially increase impervious surfaces, the operation would not result in a substantial increase in stormwater runoff requiring new stormwater drains. Operational impacts associated with the solids processing digesters would not occur and will not be addressed in the EIR/EIS at the program level.

The operation of biosolids management would continue to occur at the JWPCP and would not require the construction of new buildings or impervious surfaces. The biosolids would be transported to existing beneficial use locations, existing landfills, or existing land application areas. Since the biosolids management locations already exist, they would not increase the stormwater volume and would not need new stormwater drainage facilities. Therefore, impacts associated with the operation of biosolids management would not occur and will not be addressed in the EIR/EIS at the program level.

**UTL-4. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not require new or expanded entitlements because sufficient water supplies would be available. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The construction and operation of the conveyance improvements would not require new or expanded entitlements for potable water. Construction would require trenching and excavation for the replacement and/or maintenance of existing conveyance pipelines. Operation would simply involve the conveyance of wastewater via gravity to the WRPs and JWPCP for treatment. Therefore, construction and operation of the conveyance improvements would not require new or expanded entitlements for potable water and sufficient water supplies would be available. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** The plant expansion at the SJCWRP; process optimization at the SJCWRP, LCWRP, POWRP, and LBWRP; and improvements at the JWPCP would not result in an increased demand for potable water. Some potable water would be required during construction of the improvements at the SJCWRP, POWRP, LCWRP, LBWRP, and JWPCP for drinking water purposes and spraying water on graded areas for dust control. However, construction would be temporary and would not require new entitlements for potable water sources to be developed. Therefore, construction impacts associated with these WRPs and the JWPCP would be less than significant and will not be addressed in the EIR/EIS at the program level.

Operation of plant expansion at the SJCWRP and process optimization at the SJCWRP, LCWRP, POWRP, and LBWRP would not use large quantities of potable water. Currently, the WRPs and JWPCP use "wash water" for all water uses except drinking and safety showers. The wash water is recycled water from the facilities. The solids processing digesters also use wash water. Since the improvements at the WRPs and the JWPCP would not increase the number of employees at each facility, potable water for drinking or showering purposes would not increase. Furthermore, effluent management at the SJCWRP, POWRP, LCWRP, LBWRP, and WNWRP may actually increase the availability of treated water for beneficial reuse in the JOS service area as an additional supply to potable water supplies. Therefore, operation of the program may actually create additional water supplies for industry, landscaping, and other uses. The operation of the WRPs and JWPCP would not require new or expanded entitlements. Operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**UTL-5. Overall Determination: Less Than Significant Impact.** Construction would not result in the disruption or impediment of utility services to areas during construction. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation[a] |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | N/A |
| SJCWRP – Plant Expansion | – | N/A |
| WRP – Process Optimization | – | N/A |
| WRP – Effluent Management | N/A | N/A |
| JWPCP – Solids Processing | – | N/A |
| JWPCP – Biosolids Management | N/A | N/A |

[a] Threshold addresses construction-specific impacts; operation does not apply.

**Conveyance System.** The improvements to the conveyance system would generally be constructed in the public rights-of-way of existing streets adjacent to other utilities. The Sanitation Districts regularly maintain its existing conveyance system without disrupting utility services to areas. Construction on the conveyance system would be performed in accordance with the Sanitation Districts' normal maintenance practices. Therefore, construction impacts would not result in the disruption or impediment of utility service during construction. Construction impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs and JWPCP.** Construction for the plant expansion at the SJCWRP; process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP; and solids processing at the JWPCP would be within the existing footprints of the facilities. Because construction would be constrained to the existing footprints, it would not disrupt existing utilities. Biosolids management and WRP effluent management do not include any construction and, therefore, would not disrupt existing utility services. Therefore, the construction of improvements to the WRPs and the JWPCP would not result in disruption to or impediment of utility service to areas during construction. Impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**UTL-6. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would be served by landfill(s) with sufficient permitted capacity to accommodate solid waste disposal needs. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** Construction of the conveyance improvements and improvements to the WRPs and the JWPCP would include the demolition of several existing solids processing digesters and, therefore, would generate a small amount of waste during a single occasion. The metal of the solids processing digesters could be recycled per waste management standards and the remaining could be disposed of at a landfill. The program elements' construction waste would primarily consist of soil, as process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would require the excavation of large amounts of soil to build the underground storage tanks. Construction waste also would include concrete and asphalt. Concrete and asphalt are typically recycled and not sent to landfills. The excavated soil could be land filled or it could be beneficially reused at other Sanitation District locations or other

Los Angeles County locations. Construction solid waste could be sent by rail to Mesquite Landfill, located in Imperial County off Highway 78 and 5 miles northeast of the city of Glamis. Mesquite Landfill can receive a maximum amount of 20,000 tons per day, and has a current available capacity of 600 million tons with a projected closing date of 100 years (Sanitation Districts 2007). Therefore, construction of all program elements would be served by a landfill with sufficient capacity. Construction of all program elements would result in less than significant impacts on landfills and will not be addressed in the EIR/EIS at the program level.

Operation of the program elements would not result in significant amounts of solid waste. The program elements would upgrade and improve wastewater treatment facilities, which by their very nature, do not produce large amounts of solid waste (e.g., trash). Furthermore, the program does not include an increase in the number of employees at the WRPs or the JWPCP. Employees are generators of solid waste in industrial and commercial uses. Therefore, if the number of employees does not increase under the program, the volume of solid waste would not increase. For a discussion of biosolids, (which are not solid waste, but rather products of the wastewater treatment process), please see AG-1 (Program) for additional details on biosolids. Therefore, operation of all program elements would be served by a landfill with sufficient capacity. Operational impacts for all program elements would not occur and will not be addressed in the EIR/EIS at the program level.

**UTL-7. Overall Determination: No Impact.** Construction and operation of all program elements would comply with federal, state, and local statute and regulations related to solid waste. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**All Program Elements.** The construction and operation of all program elements would comply with all regulations related to solid waste, such as the California Integrated Waste Management Act and city recycling programs. Furthermore, the biosolids management element would comply with all biosolids waste disposal and beneficial use regulations as described in UTL-1 (Program). Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**UTL-8. Overall Determination: Less Than Significant Impact.** Construction and operation of all program elements would not require new, offset energy supply, and distribution infrastructure or capacity enhancing alterations to existing facilities. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the program level.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | – | – |
| SJCWRP – Plant Expansion | – | – |
| WRP – Process Optimization | – | – |
| WRP – Effluent Management | N/A | – |
| JWPCP – Solids Processing | – | – |
| JWPCP – Biosolids Management | N/A | – |

**Conveyance System.** The construction and operation of the conveyance improvements would not require new, offsite energy supply and distribution infrastructure or capacity-enhancing alterations to existing facilities that are not anticipated by adopted plans or programs. Construction would primarily require trenching and excavation and restoring roads to existing conditions after construction. This would typically require minimal amounts of energy usually in the form of diesel fuel for construction equipment. It would not require substantial amounts of electricity. Therefore, construction would not require new energy supplies. Wastewater is generally conveyed through the system by gravity; therefore, energy is typically not required under operating conditions. Construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the program level.

**WRPs.** Construction for the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would require some energy. Energy would primarily be used in the form of diesel for construction equipment, and small amounts of electricity may be required for construction activities, such as welding. However, construction would be temporary and would not be so substantial as to require new offsite energy supplies. Therefore, construction impacts associated with the plant expansion at the SJCWRP and process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP would be less than significant and will not be addressed in the EIR/EIS at the program level.

The operation of process optimization at the SJCWRP, POWRP, LCWRP, and LBWRP may require the pumping of wastewater, which would require some energy. However, process optimization is primarily wastewater storage and, therefore, would not require a substantial amount of energy. Furthermore, process optimization and the WRPs would use variable frequency drives. Rather than running at a constant set point, the variable frequency drives ramp up and down based on the volume of wastewater flow. Therefore, energy is saved during low flow periods. Impacts associated with the operation of process optimization would be less than significant.

The operation of the plant expansion at the SJCWRP would increase energy use. The SJCWRP currently receives approximately 5 megawatts (MW) of energy from methane captured at the Puente Hills landfill through the use of internal combustion engine(s). The remaining necessary energy of approximately 1 to 2 MW is obtained from the grid. Utility power is currently available and used at the SJCWRP whenever the internal combustion engines are out of service or need maintenance. This would continue under the operation of the plant expansion. The plant expansion at the SJCWRP would potentially increase the use of energy to approximately 8.5 MW by 2050. Therefore, at least 2 to 3 MW would likely need to be obtained from the grid. Overall, the operation of the plant expansion would result in less than significant impacts and will not be addressed in the EIR/EIS at the program level.

The operation of WRP effluent management would continue to discharge treated effluent into receiving waters. This discharge is currently performed, and would continue to perform, via gravity and would not involve the use of electricity or energy. Therefore, impacts associated with WRP effluent management would not occur and will not be addressed in the EIR/EIS at the program level.

**JWPCP.** Construction at the JWPCP would require some energy, which would primarily be used in the form of diesel for construction equipment. Small amounts of electricity may be required for construction activities, such as welding. However, construction would be temporary and would not be so substantial as to require new offsite energy supplies. Therefore, construction impacts associated with solids processing at the JWPCP would be less than significant and will not be addressed in the EIR/EIS at the program level

The JWPCP produces electricity when it treats wastewater through the gas anaerobic digestion process from the solids processing. A combined cycle power plant at the JWPCP uses gas turbines to produce

approximately 18 to 20 MW of electricity and a steam turbine generator produces approximately 4 to 6 MW of electricity. Therefore, the electricity needed to operate the proposed solids processing digesters would be provided by the JWPCP. Utility power is currently available and used whenever the JWPCP onsite power plant and steam turbine generators are out of service or need maintenance. This would continue under the operation of the new solids processing digesters. Therefore, the operation of the solids processing digesters would result in less than significant impacts and will not be addressed in the EIR/EIS at the program level.

The operation of biosolids management would not require electrical energy. The biosolids would be transported to existing beneficial use facilities, existing landfills, or existing land application areas. The transportation would require some additional diesel. The existing uses would process the biosolids as they currently do. Therefore, biosolids management would not require any new, offsite energy supply and distribution infrastructure. Operational impacts would be less than significant and will not be addressed in the EIR/EIS at the program level.

## Utilities and Service Systems and Energy Project Discussion

**UTL-1. Overall Determination: No Impact.** Construction and operation of all project elements would not exceed wastewater treatment requirements. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | See Marine Environment. | |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | See Marine Environment. | |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | See Marine Environment. | |

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** The project elements would allow the Sanitation Districts to continue to meet their wastewater treatment requirements. The project elements would ensure reliability in the existing infrastructure. The JWPCP would continue to operate at its permitted capacity of 400 MGD, and construction and operation of the project elements would not increase the permitted capacity of the JWPCP. The project elements would not exceed wastewater treatment requirements of the applicable RWQCB. Therefore, construction and operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**UTL-2. Overall Determination: No Impact.** Construction and operation of all project elements would not require the construction of new water or wastewater treatment facilities. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** All project elements include the construction of new wastewater treatment facilities. Potential significant impacts associated with the construction and operation of all project elements are discussed in the applicable resource sections of this Preliminary Screening Analysis (e.g., cultural resources, hazards and hazardous materials, air quality, noise, etc.). Any impact deemed potentially significant in this Preliminary Screening Analysis will be further addressed in the EIR/EIS. Because the potentially significant impacts of the project elements are being evaluated in their respective resource sections, this issue will not be addressed in the EIR/EIS at the project level.

**UTL-3. Overall Determination: Potentially Significant Impact.** Construction at all shaft sites may generate runoff that could require the construction of new stormwater drainage facilities. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | N/A | N/A | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | N/A | N/A | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | N/A | N/A |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | N/A | N/A |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | N/A | N/A |

**Tunnel Alignments – Onshore and Offshore.** Based on the anticipated construction method of using a TBM, the tunnel would be watertight. Equal pressure between the cutting face and the soil would be maintained. There would be minimal leakage of groundwater into the excavation because the soil interface is isolated within the pressurized cutting face. Therefore, only minimal volumes of nuisance water would need to be removed from the tunnel during construction. Water generated during tunnel construction would not be released directly into receiving waters. Furthermore, any inflow of water and/or slurry used during tunneling activities would be pumped back to a working shaft site, and thus impacts would occur at the shaft sites and not at the tunnel (similar to air quality impacts). Therefore, this threshold is not applicable to construction of the onshore and offshore tunnels and will not be addressed in the EIR/EIS at the project level.

Once the onshore and offshore tunnels are operational, they would convey secondary treated effluent from the JWPCP to the Pacific Ocean for disposal. This method of conveyance would not generate any new stormwater or require any new storm drains. Therefore, this threshold is not applicable to the operation of the onshore and offshore tunnels and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Any runoff generated at the shaft sites would be put into the sanitary sewer system maintained by the Sanitation Districts at the JWPCP, or the sewer system maintained by the City of Los Angeles for disposal at the Terminal Island Water Reclamation Plant on Terminal Island in the Port of Los Angeles. The storm drain system in the region is separate from the sewer system; all discharge into the sewer system is treated at wastewater treatment plants, whereas typically storm drains outlet into receiving waters and/or the Pacific Ocean. Construction at any shaft site would likely not need new stormwater drainage facilities but would require management plans to control any stormwater generated by the project construction sites. See HYD-7 (Project). Therefore, construction impacts associated with all shaft sites would be potentially significant and will be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** There is no runoff generated by the construction or operation of the riser and diffuser as these would be located in the Pacific Ocean. Therefore, this threshold is not applicable to the

construction or operation on the SP Shelf or PV Shelf and the rehabilitation and operation of the existing ocean outfalls and will not be addressed in the EIR/EIS at the project level.

**UTL-4. Overall Determination: Potentially Significant Impact.** Construction of the onshore and offshore tunnels and at all shaft sites could require new or expanded entitlements. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** Construction of all project elements may require substantial volumes of water that could require new or expanded entitlements because sufficient water supplies may not be available to serve the project. The water demand during construction of the onshore tunnel, offshore tunnel, and at the shaft sites has likely not been included in any water purveyor urban water management plans or water master plans. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the onshore tunnel, offshore tunnel, and shaft site permanent facilities would require no water. They would convey secondary treated effluent from the JWPCP to the Pacific Ocean. The conveyance of secondary treated effluent does not require potable water. Therefore, operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** Construction on the SP Shelf or the PV Shelf would occur in the ocean, as would the rehabilitation of the existing ocean outfalls. No potable water would be required for construction in these areas. Furthermore, once operational, the riser and diffuser on the SP Shelf or PV Shelf would be located below the ocean surface and would discharge secondary treated effluent, as would the rehabilitated existing ocean outfalls. Thus, under operating conditions, potable water would not be used. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**UTL-5. Overall Determination: Less Than Significant Impact.** Construction of all project elements would not result in the disruption or impediment of utility services during the construction period. Therefore, impacts would be less than significant, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation[a] |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | N/A | Shaft Site – Southwest Marine | – | N/A |
| Tunnel Alignment – Offshore | – | N/A | Shaft Site – Angels Gate | – | N/A |
| Shaft Site – JWPCP East | – | N/A | Shaft Site – Royal Palms | – | N/A |
| Shaft Site – JWPCP West | – | N/A | Riser/Diffuser Area – SP Shelf | – | N/A |
| Shaft Site – TraPac | – | N/A | Riser/Diffuser Area – PV Shelf | – | N/A |
| Shaft Site – LAXT | – | N/A | Riser/Diffuser Area – Existing Ocean Outfalls | – | N/A |

[a] Threshold addresses construction-specific impacts; operation does not apply.

**Tunnel Alignments – Onshore and Offshore.** The Sanitation Districts have studied the existing utilities along the alternative tunnel alignments and surrounding the shaft sites (Parsons 2011). Since the onshore tunnel would be located at depths of approximately 70 to 450 feet, only existing deep utility facilities could potentially conflict with the onshore tunnel alignments (Parsons 2011). These utilities could include abandoned or active oil production wells, monitor and injection wells, pier and bridge pilings, high pressure oil and natural gas pipelines, and utility channel crossings (Parsons 2011). Typical service utilities such as electricity, water, and wastewater would not be affected by the onshore and offshore tunnel alignments based on the depth of tunnel installation (Parsons 2011). These types of utilities are typically located within the public right-of-way of streets at depths no greater than 30 feet bgs.

As discussed in HYD-3 (Project), construction of the onshore tunnel may require the temporarily suspension of a salt water barrier injection well. This would disrupt an existing utility service that could result in significant impacts. However, these impacts would be fully analyzed under HYD-3 (Project) and will not be included in this threshold.

Therefore, these utilities would not experience a disruption or impediment during tunnel construction. Construction impacts would be less than significant and will not be addressed in the EIR/EIS at the project level.

**All Shaft Sites.** Typical service utilities such as electricity, water, and wastewater would not be affected by the shaft sites because these utilities are generally within the rights-of-way of the street and, therefore, would not experience interference with the JWPCP East, TraPac, LAXT, Angels Gate, Royal Palms, or Southwest Marine shaft sites (Parsons 2011).

The JWPCP West and JWPCP East shaft sites would be constructed in the general vicinity of the Wilmington Oil Field. There are a number of abandoned and active oil wells within the vicinity of the shaft sites. Any active oil production well within the vicinity of these two shaft sites would be avoided during construction. Therefore, construction at these two shaft sites would not result in a disruption of oil production from the Wilmington Oil Field.

The JWPCP West shaft site would require crossing Figueroa Street and West Lomita Boulevard. There are a number of small diameter utilities in both of these streets, such as an Air Force pipeline, Unocal pipelines, and an abandoned sewer line. These utilities would either have to be relocated or avoided as is common for in-street construction. Because avoidance of utility disruption is a standard construction practice that requires coordination with utility providers, this impact is considered to be less than significant.

Construction impacts associated with construction at the shaft sites would be less than significant and will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** The riser and diffuser areas on the SP Shelf or the PV Shelf would be located off the coast of Southern California, and there are no existing utilities located within the vicinity of the risers and diffuser areas (Parsons 2011). In addition, there are no existing utilities within the vicinity of the existing ocean outfalls. Therefore, there would be no construction impacts on utilities for the riser and diffuser areas, and this will not be addressed in the EIR/EIS at the project level.

**UTL-6. Overall Determination: Potentially Significant Impact.** Construction of all project elements, except rehabilitation of the existing ocean outfalls, could result in large amounts of solid waste over an extended period of time. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | X | – |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | X | – |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** Excavated soil generated by the construction of all project elements, except for the rehabilitation of the existing ocean outfalls, would be disposed of at several locations, depending on whether it is hazardous or non-hazardous materials. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level. Rehabilitation of the existing ocean outfalls would not involve trenching or dredging; therefore, disposal of dredged material would not be required. Therefore, construction impacts associated to rehabilitation of the existing ocean outfalls would be less than significant and will not be addressed in the EIR/EIS at the project level.

Under operating conditions, the project elements would be self-contained, and would convey secondary treated effluent from the JWPCP to the Pacific Ocean for disposal. Operation of the project elements would not generate any solid waste and, therefore, no impacts would occur. Operational impacts will not be addressed in the EIR/EIS at the project level.

**UTL-7. Overall Determination: No Impact.** All project elements would comply with all regulations related to solid waste, such as the California Integrated Waste Management Act and city recycling programs. Therefore, no impacts would occur, and this threshold will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | – | – | Shaft Site – Southwest Marine | – | – |
| Tunnel Alignment – Offshore | – | – | Shaft Site – Angels Gate | – | – |
| Shaft Site – JWPCP East | – | – | Shaft Site – Royal Palms | – | – |
| Shaft Site – JWPCP West | – | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | – | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | – | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**All Project Elements.** The construction and operation of all project elements would comply with all regulations related to solid waste, such as the California Integrated Waste Management Act and city recycling programs. Therefore, impacts would not occur and will not be addressed in the EIR/EIS at the project level.

**UTL-8. Overall Determination: Potentially Significant Impact.** Construction of the tunnels and shafts would result in an increased use of energy. Therefore, construction impacts related to these specific project elements would be potentially significant and will be addressed in the EIR/EIS at the project level. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | – | Shaft Site – Southwest Marine | X | – |
| Tunnel Alignment – Offshore | X | – | Shaft Site – Angels Gate | X | – |
| Shaft Site – JWPCP East | X | – | Shaft Site – Royal Palms | X | – |
| Shaft Site – JWPCP West | X | – | Riser/Diffuser Area – SP Shelf | – | – |
| Shaft Site – TraPac | X | – | Riser/Diffuser Area – PV Shelf | – | – |
| Shaft Site – LAXT | X | – | Riser/Diffuser Area – Existing Ocean Outfalls | – | – |

**Tunnel Alignments – Onshore and Offshore; All Shaft Sites.** Construction of the tunnels and at all shaft sites would require increased energy use. Therefore, construction impacts would be potentially significant and will be addressed in the EIR/EIS at the project level.

Once operational, the onshore and offshore tunnels would be used to convey secondary treated effluent from the JWPCP to the Pacific Ocean for discharge via gravity and would typically not require the use of electricity. The shafts would be converted into belowground access structure that would not require electricity. Therefore, operation would not result in an increased use of electricity and impacts would not occur. Operational impacts will not be addressed in the EIR/EIS at the project level.

**All Riser/Diffuser Areas.** Electricity would not be used to construct the riser and diffuser or to rehabilitate the existing ocean outfalls. Portable generators that use diesel would be used on the construction platforms and barges. Therefore, construction of the riser and diffuser and/or rehabilitation of the existing ocean outfalls would not require new, offsite energy supplies, or distribution infrastructure. Construction impacts would not occur and will not be addressed in the EIR/EIS at the project level.

Once operational, the riser and diffuser would release secondary treated effluent into the Pacific Ocean. This would not require the use of electricity. Therefore, the operation of the new riser and diffuser and the rehabilitation of the existing ocean outfalls would not require new, offsite energy sources. Operational impacts would not occur and will not be addressed in the EIR/EIS at the project level.

## Growth Inducing Checklist

| | | Program | | | Project | | |
|---|---|---|---|---|---|---|---|
| **XIX.** | **GROWTH INDUCING.** Would the program/project: | Potentially Significant Impact | Less Than Significant Impact | No Impact | Potentially Significant Impact | Less Than Significant Impact | No Impact |
| 1 | Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example through extension of roads or other infrastructure)? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| 2 | Remove obstacles to growth (e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development)? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| 3 | Require expansion for one or more public services to maintain desired levels of service? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| 4 | Cause economic effects that could result in other activities that could significantly affect the environment? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |
| 5 | Set a precedent that could encourage and facilitate other activities that could significantly affect the environment? | ☒ | ☐ | ☐ | ☒ | ☐ | ☐ |

## Growth Inducing Program Discussion

**XIX-1 through XIX-5. Overall Determination: Potentially Significant Impact.** Construction and operation of all program elements would have potentially significant growth-inducing impacts and, therefore, will be addressed in the EIR/EIS.

| Program Element Is Potentially Significant During | Construction | Operation |
|---|---|---|
| Conveyance System – Conveyance Improvements | X | X |
| SJCWRP – Plant Expansion | X | X |
| WRP – Process Optimization | X | X |
| WRP – Effluent Management | N/A | X |
| JWPCP – Solids Processing | X | X |
| JWPCP – Biosolids Management | N/A | X |

**All Program Elements.** The program elements could do the following:

- Indirectly induce growth through the extension of infrastructure.
- Remove obstacles to growth through the construction or extension of major infrastructure facilities that do not presently exist in the JOS service area.
- Require the expansion of one or more public services.
- Cause economic effects that could result in other activities that could significantly affect the environment (e.g., if implementation of the program would require other supporting infrastructure such as new roads or power plants to be built, causing an economic impact on the residents of the program area).

It is unlikely the program elements would set a precedent that could encourage and facilitate other activities that could significantly affect the environment. Development of long-range planning documents is within the purview of the Sanitation Districts, similar to other utilities and service districts. The Sanitation Districts have embarked on a master facilities planning process previously and have been operating under their 2010 MFP; development of an updated MFP would not set a precedent. However, this impact and those discussed above will be addressed in the EIR/EIS.

## Growth Inducing Project Discussion

**XIX-1 through XIX-5. Overall Determination: Potentially Significant Impact.** Construction and operation of all project elements would have potentially significant growth-inducing impacts and, therefore, will be addressed in the EIR/EIS.

| Project Element Is Potentially Significant During | Construction | Operation | | Construction | Operation |
|---|---|---|---|---|---|
| Tunnel Alignment – Onshore | X | X | Shaft Site – Southwest Marine | X | X |
| Tunnel Alignment – Offshore | X | X | Shaft Site – Angels Gate | X | X |
| Shaft Site – JWPCP East | X | X | Shaft Site – Royal Palms | X | X |
| Shaft Site – JWPCP West | X | X | Riser/Diffuser Area – SP Shelf | X | X |
| Shaft Site – TraPac | X | X | Riser/Diffuser Area – PV Shelf | X | X |
| Shaft Site – LAXT | X | X | Riser/Diffuser Area – Existing Ocean Outfalls | X | X |

**All Project Elements.** The project elements could do the following:

- Indirectly induce growth through the extension of infrastructure.
- Remove obstacles to growth through the construction or extension of major infrastructure facilities that do not presently exist in the JOS service area.
- Require the expansion of one or more public services.
- Cause economic effects that could result in other activities that could significantly affect the environment (e.g., if the TBM would require a lot of offsite power resulting in the need for new power generating facilities, causing an economic impact that could have a significant effect on the environment).

It is unlikely the project elements would set a precedent that could encourage and facilitate other activities that could significantly affect the environment. The Sanitation Districts have an existing ocean discharge system that is currently being used and the project is proposed in response to growth in the region as well as the need to increase infrastructure reliability. However, impacts will still be addressed in the EIR/EIS.

# Chapter 4
# REFERENCES

## 4.1 Printed References


Cadien, D.B., et al. 2006. Identifying biological assemblages of soft and hard bottom habitats on the San Pedro Sea Shelf, California using remote sampling technique [Poster]. Abstract OS15F – 12IN: American Geophysical Union. EOS Transaction AGU, 87(36) in 2006 Ocean Science Meeting Supplement, Program and Abstracts. Honolulu, Hawaii: U.S.A. American Geophysical Union.

California Department of Conservation. 1986a. State of California Special Studies Zones. Los Alamitos Quadrangle. Los Angeles County, CA. 7.5 Minute Series. Available: <http://gmw.consrv.ca.gov/shmp/download/ap/pdf/LOSALAMITOS.PDF>. Accessed: January 20, 2012.

———. 1986b. State of California Special Studies Zones. Torrance Quadrangle. Los Angeles County, CA. 7.5 Minute Series. Available: <http://gmw.consrv.ca.gov/shmp/download/ap/pdf/TORRANCE.PDF>. Accessed: January 20, 2012.

———. 1991. State of California Special Studies Zones. El Monte Quadrangle. Los Angeles County, CA. 7.5 Minute Series. Available: <http://gmw.consrv.ca.gov/shmp/download/ap/pdf/ELMONTE.PDF>. Accessed: January 20, 2012.

———. 1999a. State of California Seismic Hazard Zones. El Monte Quadrangle. Available: <http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_elmo.pdf>. Accessed: January 20, 2012.

———. 1999b. State of California Seismic Hazard Zones. Whittier Quadrangle. Available: <http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_whitt.pdf>. Accessed: January 20, 2012.

———. 1999c. State of California Seismic Hazard Zones. Los Alamitos Quadrangle. Available: <http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_lalmi.pdf>. Accessed: January 20, 2012.

———. 1999d. State of California Seismic Hazard Zones. San Dimas Quadrangle. Available: <http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_sdim.pdf>. Accessed: January 20, 2012.

———. 1999e. State of California Seismic Hazard Zones. Torrance Quadrangle. Available: <http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_tor.pdf>. Accessed: January 20, 2012.

———. 1999f. State of California Seismic Hazard Zones. San Pedro Quadrangle. Available: <http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_sped.pdf>. Accessed: January 20, 2012.

———. 2008. Los Angeles Important Farmland. Available: <ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2008/los08.pdf >. Accessed: November 17, 2011.

———. 2009. Important Farmland in California, 2006. Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Available: <ftp://ftp.consrv.ca.gov/pub/dlrp/fmmp/pdf/statewide/2006/fmmp2006_08_11.pdf>. Accessed: November 18, 2011.

———. 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available: <http://www.quake.ca.gov/gmaps/ap/ap_maps.htm>. Accessed: January 20, 2012.

California Department of Conservation, Division of Mines and Geology. 1994. Update of Mineral Land Classification of Portland Cement Concrete Aggregate in Ventura, Los Angeles, and Orange Counties, California Part II Los Angeles County. Generalized Mineral Land Classification Map of Los Angeles County – South Half. Open-File Report 94-14, Plate 1B.

CDFG (California Department of Fish and Game). 2011a. California Natural Diversity Database. Rarefind 4 Application. Results of species queries for Baldwin Park, El Monte, Long Beach, Los Alamitos, San Dimas, San Pedro, Torrance, Seal Beach, and Whittier quads. Available: <https://nrmsecure.dfg.ca.gov/gridprint.aspx>. Accessed: November 18, 2011.

———. 2011b. Summary of Natural Community Conservation Plans (NCCPs). November. Available: <http://www.dfg.ca.gov/habcon/nccp/status/index.html>. Accessed: November 15, 2011.

———. 2012. Summary of Natural Community Conservation Plans (NCCPs). January 2012. Available: <http://www.dfg.ca.gov/habcon/nccp/>. Accessed: January 21, 2012.

Caltrans (California Department of Transportation). 2004. Transportation- and Construction-Induced Vibration Guidance Manual. Sacramento, CA. June.

———. 2009. Officially designated State Scenic Highways. Available: <http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm>. Last Updated: November 16, 2007. Accessed: November 18, 2009.

———. 2010. California Scenic Highway Program. Officially Designated State Scenic Highways. Available: <http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm>. Accessed: April 26, 2010. Last revised: November 16, 2007.

CalEPA (California Environmental Protection Agency). 2009a. Department of Toxic Substances Control Cortese List. Available at: http://www.envirostor.dtsc.ca.gov/public/search.asp?cmd=search&reporttype=CORTESE&site_type=CSITES%2COPEN%2CFUDS%2CCLOSE&status=ACT%2CBKLG%2CCOM&reporttitle=HAZARDOUS%20WASTE%20AND%20SUBSTANCES%20SITE%20LIST. Accessed on: November 18, 2009.

———. 2009b. EnviroStor Database. Available at: http://www.envirostor.dtsc.ca.gov/public/search.asp. Accessed on: November 18, 2009.

———. 2009c. Cortese List Data Resources List of Active CDO and CAO from Water Board (MS Excel, 632 KB). Available at: < http://www.calepa.ca.gov/SiteCleanup/CorteseList/>. Accessed on: November 18, 2009. California Natural Diversity Database (CNDDB). California Natural Diversity Database Search. 2008.

Central Basin Municipal Water District. 2005. 2005 Urban Water Management Plan. Carson, CA.

City of Carson. 2004. General Plan City of Carson. Final. Carson, CA. Prepared by the City of Carson.

City of Los Angeles. 1990. San Pedro Specific Plan. Los Angeles, CA. November, 30 1990.

———. 1992. Port of Los Angeles A Part of the General Plan of the City of Los Angeles. Adopted 1982.

———. 1996. City of Los Angeles General Plan, Safety Element. Adopted November 26, 1996.

———. 1998. City of Los Angeles General Plan, Transportation Element, Map E, Scenic Highways in the City of Los Angeles. Prepared by the Citywide Transportation. June 1998.

———. 1999a. Transportation Element of the General Plan. Available: <http://cityplanning.lacity.org/cwd/gnlpln/transelt/index.htm>. Accessed: April 27, 2010.

———. 1999b. San Pedro Community Plan. Available: http://www.lacity.org/PLN.

———. 1999c. Wilmington-Harbor City Community Plan. July 14.

City of Los Angeles –Navigate LA. 2009. Available: <http://navigatela.lacity.org/index.cfm>. Accessed: November 18, 2011.

City of Pomona. 1976. City of Pomona General Plan. Map 9 – Scenic Views in the Community.

City of Rancho Palos Verdes. 2006. NCCP Reserve Boundary Parcels. Map. Available: <http://www.palosverdes.com/rpv/planning/Palos-Verdes-Nature-Preserve/NCCP%20Preserve.official%20map.06_26_06.pdf>. Accessed: November 21, 2011.

County of Los Angeles. 2009. Tsunami Inundation Map for Emergency Planning. State of California – County of Los Angeles. Torrance and San Pedro Quadrangle Map. March 1, 2009. Available: <http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/LosAngeles/.

County of Los Angeles, Department of Regional Planning. 2010. Unincorporated Areas Zoning Map. Available: <http://planning.lacounty.gov/gisnet>. Accessed: February 2, 2010.

Crowder, Robert and Larry Olson. 1978. Polymer Flooding in Wilmington Oil Field, Ranger Zone, Fault Block V and Shallow Aquifers and Surface Casing Requirements for Wilmington and Belmont Offshore Oil Fields. Publication No. TR22. Published by: California Department of Conservation Division of Oil and Gas.

Dartnell et al. 2006. An Empirical Approach to Mapping the Distribution of Seafloor Geologic and Biologic Characteristics Offshore San Pedro, Southern California. 2006 Ocean Sciences Meeting. Honolulu, HI. February 20.

Department of Conservation, Division of Land Resource Protection. 2006. California Williamson Act 2004. Geographic Information System data as of 1-1-2004. Printed May 19, 2006. Available: <ftp://ftp.consrv.ca.gov/pub/dlrp/WA/Map%20and%20PDF/CALIFORNIA%20WILLIAMSON%20ACT/CA%20WA%202004.pdf>. Accessed: January 19, 2012.

DWR (Department of Water Resources). 2003. California's Groundwater - Bulletin 118. October.

ESRI. 2009a. Street Map: Cemeteries. Geographic Information System data layer.

———. 2009b. Street Map: Airports. Geographic Information System data layer.

Fugro (Fugro West, Inc.). 2011. Preliminary Site Characterization Report JWPCP Tunnel and Ocean Outfall Project Los Angeles, California. Prepared for Sanitation Districts of Los Angeles County, November 2011. Fugro Job No. 04.B3387004.

GeoLogic Associates. 1995. Preliminary Geotechnical Investigation Expansion of Water Treatment Facilities Carson Joint Water Pollution Control Plant Expansion. Prepared for County Sanitation Districts of Los Angeles County, October 1995. Job No. 9421.

Harris, C. M. (ed.). 1979. Handbook of noise control. 2nd edition. New York: McGraw-Hill, Inc.

Hesson, Bruce and Herman Olilang. 1990. Seal Beach Oil Field Alamitos and Marine Areas. Publication No. TR39. Published by: Department of Conservation Division of Oil and Gas.

Jones & Stokes. 1994. Draft Program Environmental Impact Report for the Joint Outfall System, 2010 Master Facilities Plan. November. Sacramento, CA. Prepared for the Sanitation Districts of Los Angeles County, Whittier, CA.

Larson, K. 2007. Birds of the Peninsula, November and December 2006. Humin'. Vol. XXIX (1): 4-5. Palos Verdes/South Bay Audubon Society. Palos Verdes, CA.

LARWQCB (Los Angeles Regional Water Quality Control Board). 1995. Water Quality Control Plan for the Los Angeles Region – Basin Plan for the Coastal Watershed of Los Angeles and Ventura Counties. Available at: <http://www.swrcb.ca.gov/rwqcb4/html/meetings/tmdl/Basin_plan/basin_plan_doc.html> Accessed: June 2007.

MWD (Metropolitan Water District). 2007. A Status Report on the Use of Groundwater in the Service Area of the Metropolitan Water District of Southern California. Report Number 1308. September. Pages: IV-3-1 – IV-3-16.

Parsons. 2011. Professional Design Services for the Preliminary Engineering of the Joint Water Pollution Control Plant Tunnel and Ocean Outfall Feasibility Study Report. Prepared for Sanitation Districts of Los Angeles County, November 30, 2011. Parsons Project No. 260252.

Sanitation Districts (Sanitation Districts of Los Angeles County). 2007. Mesquite Regional Landfill – Site Information. Accessed: January 22, 2010. Available: http://mrlf.org/index.php?pid=5.

———. 2010. JWPCP Depth to Water and Depth to Bottom Data. February 12, 2010.

State of California Natural Resources Agency. 2010. Adopted Text of the CEQA Guidelines Amendments (Adopted December 30, 2009, Effective March 18, 2010. Available: <http://ceres.ca.gov/ceqa/docs/Adopted_and_Transmitted_Text_of_SB97_CEQA_Guidelines_Amendments.pdf>. Accessed: November 15, 2011.

SWRCB (State Water Resources Control Board). 2005. California Ocean Plan. Water Quality Control Plan, Ocean Waters of California.

———. 2009. GeoTracker: Environmental Data for Regulated Facilities in California. Available: <http://geotracker.swrcb.ca.gov/>. Accessed: November 18, 2009.

USFWS (U.S. Fish and Wildlife Service). 2008. Palos Verdes Blue Butterfly (*Glaucopsyche lygdamus palosverdesensis*). 5-Year Review: Summary and Evaluation. Carlsbad, CA. March.

———. 2011a. Habitat Conservation Plans. Regional Habitat Conservation Plans. Pacific Southwest Region. Carlsbad Fish & Wildlife Office. Available: <http://www.fws.gov/carlsbad/HCPs/CarlsbadCFWORegionalHCPs%20.html>. Accessed: November 18, 2011.

———. 2011b. FWS Critical Habitat for Threatened & Endangered Species. Online mapper. Available: <http://criticalhabitat.fws.gov/crithab/>. Accessed: November 18, 2011.

USGS (U.S. Geological Survey). 2009a. San Pedro Quadrangle California. 7.5-Minute Series.

———. 2009b. Torrance Quadrangle California. 7.5-Minute Series.

USGS Geographic Names Information System (GNIS). 2009. Available: <http://geonames.usgs.gov/>. Accessed: November 16, 2009.

## 4.2 Personal Communications

Garrow, Pat. Senior Planner. City of Long Beach Advance Planning Department. November 30, 2011 – Email.

Signo, John F. Senior Planner. City of Carson Planning Division. December 5, 2011 – Email.

## Appendix 1-B
# AGENCY AND PUBLIC SCOPING REPORT

# Appendix 1-B
# AGENCY AND PUBLIC SCOPING REPORT

## Introduction

The Clearwater Program is a comprehensive planning effort undertaken by the Sanitation Districts of Los Angeles County (Sanitation Districts) to ensure that the Joint Outfall System (JOS), serving 73 cities and unincorporated county areas within metropolitan Los Angeles County, will continue to provide environmentally sound and cost-effective wastewater management through the year 2050. This report summarizes the public and agency scoping efforts that occurred during the preparation of the Clearwater Program Draft Master Facilities Plan (MFP) and associated Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS).

The Clearwater Program MFP and EIR/EIS were prepared in conformance with the California State Water Resources Control Board's policy for implementing the Clean Water State Revolving Fund (SRF) Program for the construction of wastewater management facilities. In addition, the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) require project proponents to consult with agency and public stakeholders during the preparation of the draft EIR/EIS. The lead agencies – the Sanitation Districts and the U.S. Army Corps of Engineers (Corps) – made a commitment to go beyond the statutory requirements outlined in CEQA and NEPA by engaging and involving agencies and the public early and often throughout the planning process.

## Public Outreach and Participation

Public outreach for the Clearwater Program began in January 2007 and continues today. The Sanitation Districts relied on multiple forms of outreach to ensure that potentially impacted communities were engaged early in the planning process, long before any decisions were made. This multi-faceted approach, the components of which are listed below, facilitated a productive exchange of information and ideas between the Sanitation Districts and stakeholders.

- Public Workshops (San Pedro, Wilmington, Rancho Palos Verdes, and Carson)
- Slide Presentations
- Individual and Group Meetings (Over 500)
- Informational Video
- Newsletter Updates
- Internet Website (www.ClearwaterProgram.org)
- Telephone Hot-Line (877-300-WATER)

# Notice of Preparation

CEQA requires the preparation and circulation of a Notice of Preparation (NOP) at the onset of the EIR process. An NOP must provide sufficient information describing a project and potentially significant environmental impacts such that it enables responsible agencies to provide a meaningful response. At minimum, the NOP needs to include:

- Brief description of the proposed project
- Description of the proposed project's location
- Probable environmental effects of the proposed project
- Date, time, and place of the public hearing
- Address where documents or files relating to the proposed project are available for review
- Address where written comments on the scope of the EIR may be sent
- Deadline for submitting comments

In accordance with CEQA, the Sanitation Districts issued an NOP on October 10, 2008, indicating that an EIR would be prepared for the Clearwater Program MFP. The NOP was sent to 834 stakeholders. The NOP included a description of the programmatic evaluation of the infrastructure and facilities within the JOS and the potential changes required to manage wastewater flows projected through the year 2050. Additionally, the NOP described the project-specific need for a new Joint Water Pollution Control Plant (JWPCP) effluent tunnel/ocean outfall, and the area under consideration for its construction. As required by CEQA, the NOP listed the probable environmental effects of the Clearwater Program MFP's program-wide and project-specific components. A copy of the NOP is included at the end of this report as Attachment 1.

# Notice of Intent

NEPA requires the preparation and publication of a Notice of Intent (NOI) to prepare a draft EIS. At minimum, an NOI needs to include:

- Description of the proposed action
- Description of possible alternatives to the proposed action
- Description of the lead agency's scoping process, including time and place of scoping meetings
- Name and address of the lead agency contact for the proposed action and EIS

The Corps determined that the Clearwater Program would require the preparation of an EIS. In accordance with NEPA, the Corps published the NOI in the Federal Register (Volume 73, No. 194) on October 6, 2008, announcing its intent to prepare a draft EIS/EIR for the Clearwater Program in conjunction with the Sanitation Districts. A copy of the NOI is included at the end of this report as Attachment 2.

The NOI explained that the construction of a new JWPCP effluent tunnel/ocean outfall identified in the Clearwater Program MFP would entail discharge of dredge and fill materials in waters of the United States, work in navigable waters of the United States, and, potentially, transport of dredge material for ocean disposal – all of which require federal permits. The Corps would potentially need to issue permits

pursuant to Section 404 of the Clean Water Act; Section 10 of the Rivers and Harbors Act; and, if necessary, Section 103 of the Marine Protection, Research, and Sanctuaries Act.

In addition to publishing the NOI in the Federal Register, hardcopies were mailed to multiple agencies and an electronic version was distributed via email to other interested parties and stakeholders.

# NOP and NOI Comments

A summary of written and oral comments received on the NOP and NOI during the scoping period is presented in Table 1. Copies of written comments and the transcripts of oral comments received at the scoping meetings are included at the end of this report as Attachments 3 and 4, respectively.

**Table 1. Summary of Written and Oral Comments on the NOP/NOI**

| Date | Agency/Organization | Commenter | Comment Summary |
|---|---|---|---|
| 10/15/2009 | Office of Planning and Research | Scott Morgan | ▪ Provides confirmation of receipt and forward to identified agencies. |
| 10/15/2009 | California Integrated Waste Management Board | Margo Reid Brown | ▪ Identifies that letter regarding NOP will be made part of the record of the California Integrated Waste Management Board. |
| 10/17/2008 | Department of Conservation, Division of Oil, Gas, and Geothermal Resources | Paul Frost | ▪ Asks for oil wells to be plotted on maps.<br>▪ Identifies specific required actions and resources related to building and construction near plugged and abandoned wells. |
| 10/17/2008 | South Coast Air Quality Management District | Steve Smith | ▪ Requests that draft EIR be sent with applicable data/appendices.<br>▪ Recommends resources and specific methodology and to be used in analysis.<br>▪ Recommends resources for development of mitigation measures.<br>▪ Provides data source information. |
| 10/20/2008 | Native American Heritage Commission | Dave Singleton | ▪ Recommends actions to assess impacts to historical resources. |
| 10/30/2008 | City of Norwalk | Chino Consunji | ▪ Identifies future transportation projects to take place in the service area. |
| 11/3/2008 | City of Glendora | David Chantarangsu | ▪ Provides source for growth projections. |
| 11/4/2008 | U.S. Environmental Protection Agency | Paul Amato | ▪ Requests that two hardcopies and one compact disc copy of the draft EIS be sent to his office when sending to Washington DC office. |
| 11/4/2008 (attached 7/30/2008 letter) | U.S. Environmental Protection Agency | Carmen White | ▪ Provides information on Superfund site located on the Palos Verdes Shelf and outfall alignment. |

**Table 1 (Continued)**

| Date | Agency/Organization | Commenter | Comment Summary |
|---|---|---|---|
| 5/5/2008 (attached 11/4/2008 letter) | U.S. Environmental Protection Agency | Paul Amato | ▪ Asks for rationale for thresholds of significance to be described.<br>▪ Identifies NEPA requirements for alternatives evaluation and discussion.<br>▪ Provides clarification of draft EIS scope for Air Quality analysis. Includes methodology and sources.<br>▪ Provides clarification of draft EIS scope for Biological Resources analysis.<br>▪ Provides clarification of draft EIS scope for Hazards and Hazardous Materials analysis.<br>▪ Provides clarification of draft EIS scope for Hydrology/Water Quality. Includes methodology and sources.<br>▪ Provides clarification of draft EIS scope for Cumulative Impacts. Includes methodology and sources.<br>▪ Provides clarification of draft EIS scope for mitigation monitoring and reporting. Includes methodology.<br>▪ Describes/requests cumulative impact analysis for outfall on Marine Environment. |
| 11/5/2008 | Federal Emergency Management Agency | Gregor Blackburn | ▪ Requests review of FIRMs and provides a summary of NFIP floodplain management building requirements. |
| 11/5/2008 | San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy | Belinda Faustinos | ▪ Provides source for Conservancy's Watershed and Open Space Plan.<br>▪ Includes sources of GIS planning tools for access to habitat, watershed, and recreation information.<br>▪ Describes concerns about assumption of wastewater flow increases.<br>▪ Identifies potential for wastewater flow reductions.<br>▪ Identifies concerns for habitat, open space, and recreation. |
| 11/5/2008 | Resident | JoAnn Wysocki | ▪ Oral comments identifying concerns similar to those mentioned in her 11/12/2008 comment letter. |
| 11/5/2008 | Wilmington Property Owners of Wilmington | Arthur Hernandez | ▪ Identifies possible alignment alternatives. |
| 11/6/2008 | Resident | JoAnn Wysocki | ▪ Partial draft of 11/12/2008 comments. |
| 11/6/2008 | Resident | JoAnn Wysocki | ▪ Wants to know the Corps' primary concern for the project.<br>▪ Question regarding whether city of LA Quimby funds apply to this project. LACSD unsure, but will check with city.<br>▪ Comment regarding the delivery of comments to Corps.<br>▪ Proposes alternative route for the tunnel: Sanitation Plant in Carson, west on Lomita to Vermont Avenue, south through Five Points, along Gaffey to channel, left hand turn on channel and arrive at Harbor.<br>▪ Discussion of getting on Corps' mailing list.<br>▪ Question regarding length of truck trips/construction, which was identified to be 4 to 8 years. |

**Table 1 (Continued)**

| Date | Agency/Organization | Commenter | Comment Summary |
|---|---|---|---|
| 11/6/2007 | Resident and President of the Harbor Association of Industry and Commerce | Bill Lyte | ▪ Harbor Association of Industry and Commerce is to support the project as it provides critical infrastructure and vital construction jobs.<br>▪ Recommends choosing excavation sites within the Port of Los Angeles.<br>▪ Suggests electric trucks for transfer of tunneling muck.<br>▪ Suggests clean excavated material to be used as fill in the Port. |
| 11/6/2008 | Resident | Mark Wells | ▪ Raises concerns that the construction truck traffic would be using existing taxed infrastructure (three vehicular bridges and one train bridge) to get to and from Terminal Island construction shaft site.<br>▪ Points out that the residents being impacted by the construction would not directly benefit from the project.<br>▪ Asks what residents of San Pedro would receive from having a tunnel go under their neighborhoods. |
| 11/6/2008 | Marine Animal Care Center, Fort MacArthur | David Bard | ▪ Asks which alignment is preferred.<br>▪ Requests more specifics regarding potential shaft sites in and around Angels Gate Park.<br>▪ Wants to know the ratio of treated outflow between the new outfall and the existing outfalls.<br>▪ Asks if the draft EIR will address the effects of a new outfall on nutrient loads in the ocean or subsequent effects on the increase of algae and bio-toxins and effects on the marine life.<br>▪ Questions how the prevailing currents will impact the outflow. |
| 11/6/2008 | Resident | Richard Pawlowski | ▪ Asks the size of the outflow pipe.<br>▪ Suggests that harnessing energy from the high-velocity outflow should be considered.<br>▪ Suggests piping some of the semi-clean water to places that might use it for lakes or the Owens Valley dust problem.<br>▪ States that the EIR should include the impacts from truck traffic every day for 8 years. Mentions that the clean truck program has just been put into effect. |
| 11/6/2008 | Wilmington Resident | Pat Roman | ▪ States that it is a big problem that only 40 percent of the reclaimed water is being used. Consider thoughtfully the infrastructure for cumulative projects, construction permitting, and water use. |
| 11/6/2008 | Point Fermin Resident | Ron Stolte | ▪ Supports Terminal Island. |
| 11/12/2008 | Resident | JoAnn Wysocki | ▪ Identifies concerns for alignment and effects to the Wilmington area. |
| 11/13/2008 | County of Los Angeles, Department of Parks and Recreation | Jui Ing Chien | ▪ Requests analysis of impact of site shaft to park. |
| 11/14/2008 | City of Los Angeles, Bureau of Sanitation | Enrique Zaldivar | ▪ Provides information about city of LA's wastewater facilities.<br>▪ Requests TIWRP's effluent to be included in outfall analysis. |
| 11/14/2008 | Marine Mammal Care Center at Fort MacArthur | David Bard | ▪ Requests analysis of impact to ocean nutrients and algal blooms. |

**Table 1 (Continued)**

| Date | Agency/Organization | Commenter | Comment Summary |
|---|---|---|---|
| 11/17/2008 | Palisades Residence Association | Not applicable | ▪ Requests the use of specific aesthetics analysis.<br>▪ Requests the use of specific air quality sources and analysis.<br>▪ Requests including the analysis of specific biological resources.<br>▪ Requests analysis of specific cultural resources.<br>▪ Requests specific concerns for water quality and wind be addressed.<br>▪ Requests specific documents be incorporated or discussed.<br>▪ Requests description of construction noise.<br>▪ Requests specific analysis of local transportation and traffic impacts.<br>▪ Requests thorough analysis of cumulative impacts considering the other projects in the area. |
| 11/18/2008 | Port of Los Angeles | Ralph Appy | ▪ Identifies jurisdictional issues related to use of Harbor District property.<br>▪ Identified requirements for consideration in alternatives.<br>▪ Identifies various specific issues/areas for analysis that are of particular concern to the Port.<br>▪ Provides Port site construction performance requirements.<br>▪ Provides a table of Port-identified related cumulative projects. |
| 11/21/2008 | California State Lands Commission | Gail Newton | ▪ Provides information on potential need for a lease if discharge pipelines located on sovereign lands. |
| 12/5/2008 | California State Lands Commission | Jane Smith | ▪ Provides information on potential need for a lease if discharge pipelines located on sovereign lands. |
| 12/8/2008 | County of Los Angeles, Department of Public Works | Dennis Hunter | ▪ Requests opportunity to review EIR and traffic studies. Includes methodology and resources. |
| 1/29/2009 | County of Los Angeles Fire Department | Frank Vidales | ▪ Requests erosion control, watershed management, rare and endangered species, vegetation fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and County Oak Tree Ordinance be addressed in the draft EIR. |
| Unknown | Resident | Pat Rome | ▪ Requests explanation of use of reclaimed water, and construction permits. |
| Unknown | Resident | JoAnn Wysocki | ▪ Partial draft of 11/12/2008 comments. |

# Public Scoping Meetings

Scoping is the process by which input is solicited from agencies and stakeholders on the nature and extent of issues and impacts to be addressed in an EIR and/or EIS and the methods by which they will be evaluated. Scoping helps to identify the range of actions, alternatives, environmental effects, methods of assessment, and mitigation measures to be analyzed in greater detail. It also helps eliminate those issues that are not relevant to the decision at hand.

Formal scoping meetings are not required by CEQA, but are necessary when preparing an EIR/EIS jointly with a federal agency due to NEPA requirements. NEPA specifically requires the lead agency to consult with federal agencies that have jurisdiction by law or have special expertise on the proposed action, and to solicit public input during the preparation of the EIS. NEPA requires the federal lead agency's scoping process to:

- Invite affected federal, state, and local agencies, Indian tribes, project proponents, and others interested in the EIS process
- Determine the potential significant environmental issues to be analyzed in depth
- Identify and eliminate issues determined to be insignificant or addressed in other documents
- Allocate assignments among the lead agency and cooperating agencies regarding preparation of the EIS, including impact analysis and identification of mitigation measures
- Identify related environmental documents under development
- Identify other environmental review and consultation requirements

Five public scoping meetings for the Clearwater Program were conducted in fall 2008, soon after the NOP and NOI were released. Notice of all five scoping meetings was included in the NOP; the fifth meeting was also noticed in the NOI. An advertisement announcing the public scoping meetings was placed in the Daily Breeze, San Gabriel Valley Tribune, Pasadena Star News, Whittier Daily News, Inland Valley Daily Bulletin, Impacto, Peninsula News, Press Telegram, Beach Reporter, Wave Pub West Edition, La Opinion, and Random Lengths News. A copy of the advertisement is included at the end of this report as Attachment 5.

The Sanitation Districts and the Corps conducted a joint public scoping meeting, in both English and Spanish, for the Clearwater Program EIR/EIS:

November 6, 2008 at 6:30 pm
Crowne Plaza Los Angeles Harbor Hotel
601 S. Palos Verdes Street
San Pedro, California

The Sanitation Districts conducted four additional public scoping meetings for the EIR:

October 29, 2008 at 6:30 pm
Carson Community Center
801 East Carson Street
Carson, California

October 30, 2008 at 1:30 pm
Sanitation Districts Joint Administration Office
1955 Workman Mill Road
Whittier, California

October 30, 2008 at 6:30 pm
Sanitation Districts Joint Administration Office
1955 Workman Mill Road
Whittier, California

November 5, 2008 at 6:30 pm
Wilmington Senior Center
1371 Eubank Avenue
Wilmington, California

# Additional Scoping Meetings

In addition to the five public scoping meetings conducted in October/November 2008, scoping meetings were held with federal, state, and local agencies as well as councils of governments, environmental groups, and community advisory committees.

## Federal Agency Consultations

Table 2 lists the scoping meetings with federal agencies prior to release of the draft EIR/EIS.

**Table 2. List of Federal Agency Coordination Meetings**

| Date | Agency/Organization |
|---|---|
| 3/22/2007 | U.S. Navy (Defense Fuel Support Point) |
| 3/28/2007 | U.S. Coast Guard |
| 10/22/2007 | U.S. Environmental Protection Agency |
| 12/10/2007 | U.S. Environmental Protection Agency |
| 3/9/2009[a] | National Marine Fisheries Service |
| 3/23/2009[a] | U.S. Fish and Wildlife Service |
| 6/26/2009[a] | U.S. Coast Guard |
| 7/16/2009 | Bureau of Ocean Energy Management |
| 2/9/2010[a] | U.S. Environmental Protection Agency |
| 3/17/2010[a] | National Marine Fisheries Service |
| 3/19/2010[a] | U.S. Fish and Wildlife Service |
| 8/26/2010 | Bureau of Ocean Energy Management |
| 8/25/2011[a] | U.S. Environmental Protection Agency |

[a] The U.S. Army Corps of Engineers participated in this agency scoping meeting.

## State Agency Consultations

Table 3 lists the scoping meetings with state agencies held prior to release of the draft EIR/EIS.

**Table 3. List of State Agency Coordination Meetings**

| Date | Agency/Organization |
|---|---|
| 10/22/2007 | Regional Water Quality Control Board, Los Angeles Region |
| 3/29/2011[a] | California Coastal Commission |
| 5/18/2011[a] | State Lands Commission |
| 7/14/2011[a] | California Department of Fish and Game |
| 12/8/2011 | Regional Water Quality Control Board, Los Angeles Region |

[a] The U.S. Army Corps of Engineers participated in this agency scoping meeting.

## Local Agency Consultations

Table 4 lists the scoping meetings with local agencies held prior to release of the draft EIR/EIS.

## Table 4. List of Local Agency Coordination Meetings

| Date | Agency/Organization |
|---|---|
| 1/28/2006 | City of Los Angeles, Economic Development |
| 2/23/2006 | City of Los Angeles, Port of Los Angeles |
| 3/1/2006 | City of Los Angeles, Bureau of Sanitation |
| 4/18/2006 | City of Los Angeles, Council District 15 |
| 8/22/2006 | City of Los Angeles, Environmental Affairs |
| 9/20/2006 | City of Los Angeles, Port of Los Angeles |
| 10/2/2006 | City of Los Angeles, Department of Water and Power |
| 10/11/2006 | City of Los Angeles, Port of Los Angeles |
| 12/8/2006 | City of Los Angeles, Department of Recreation and Parks |
| 2/2/2007 | California Water Company |
| 2/2/2007 | City of Palos Verdes Estates |
| 2/7/2007 | Los Angeles Board of Harbor Commissioners |
| 2/8/2007 | City of Los Angeles, Director of Environmental Affairs |
| 2/8/2007 | City of Los Angeles |
| 2/15/2007 | City of Long Beach |
| 2/27/2007 | Los Angeles County, Sybil Brand Commission |
| 3/27/2007 | Los Angeles Fire Department, Harbor Division |
| 4/3/2007 | Water Replenishment District of Southern California |
| 5/14/2007 | Metrolink |
| 8/30/2007 | City of Rancho Palos Verdes |
| 9/13/2007 | City of Los Angeles, Port of Los Angeles |
| 10/18/2007 | Los Angeles Board of Harbor Commissioners |
| 4/7/2008 | City of Los Angeles, Council District 15 |
| 4/25/2008 | City of Los Angeles, Council District 1 |
| 7/24/2008 | City of Gardena |
| 12/1/2008 | Central Basin Municipal Water District |
| 12/16/2008 | County of Los Angeles, Department of Parks and Recreation |
| 1/30/2009 | Metropolitan Water District of Southern California |
| 9/2/2009 | South Coast Air Quality Management District |
| 11/10/2009 | City of Los Angeles, Department of Parks and Recreation |
| 2/4/2010 | City of Los Angeles, Department of Transportation |
| 2/4/2010 | County of Los Angeles, Department of Public Works |
| 2/8/2010 | City of Carson |
| 3/5/2010 | County of Los Angeles, Regional Planning |
| 7/26/2010 | City of Los Angeles, Port of Los Angeles |
| 7/28/2010 | City of Los Angeles, Department of Recreation and Parks |
| 10/7/2010 | County of Los Angeles, Department of Beaches and Harbors |
| 4/7/2011 | County of Los Angeles, Supervisorial District 4 |
| 4/12/2011 | City of Los Angeles, Council District 15 |
| 4/13/2011 | City of Carson |
| 4/14/2011 | City of Rancho Palos Verdes |
| 5/10/2011 | City of Los Angeles |
| 5/11/2011 | City of Rancho Palos Verdes |
| 5/23/2011 | City of Rolling Hills Estates |

**Table 4 (Continued)**

| Date | Agency/Organization |
|---|---|
| 5/24/2011 | City of Rolling Hills |
| 6/14/2011 | City of Rancho Palos Verdes |
| 6/30/2011 | City of Los Angeles, Bureau of Sanitation |
| 8/29/2011 | City of Los Angeles, Bureau of Sanitation |
| 6/23/2011 | City of Los Angeles, Port of Los Angeles |
| 11/17/2011 | City of Los Angeles, Port of Los Angeles |
| 1/11/2011 | City of Carson |
| 2/3/2012 | City of Los Angeles, Council District 15 |

# Other Consultations

Table 5 lists the scoping meetings with councils of governments, environmental groups, neighborhood councils, chambers of commerce, and community advisory committees held prior to release of the draft EIR/EIS.

**Table 5. List of Other Organization Coordination Meetings**

| Date | Agency/Organization |
|---|---|
| 12/19/2006 | JWPCP Community Advisory Committee |
| 1/23/2007 | Northeast San Pedro Neighborhood Council |
| 1/30/2007 | Wilmington Neighborhood Council |
| 1/31/2007 | Wilmington Neighborhood Council |
| 1/31/2007 | Central San Pedro Neighborhood Council |
| 2/13/2007 | Carson Chamber of Commerce |
| 2/13/2007 | Wilmington Chamber of Commerce |
| 2/13/2007 | Port Community Advisory Committee |
| 2/15/2007 | Saint Peter and Paul Elementary School |
| 2/15/2007 | San Pedro Homeowners United |
| 2/16/2007 | Wilmington Coordinating Council |
| 2/26/2007 | Los Angeles Unified School District, District 8 |
| 2/27/2007 | Coastal San Pedro Neighborhood Council |
| 2/27/2007 | Port Citizen Advisory Committee |
| 3/1/2007 | Wilmington Chamber of Commerce |
| 3/1/2007 | Dodson Middle School |
| 3/7/2007 | Northwest San Pedro Neighborhood Council Board |
| 3/7/2007 | Pacific Corridor Community Advisory Committee |
| 3/9/2007 | Ponte Vista Community Advisory Committee |
| 3/9/2007 | Northwest San Pedro Neighborhood Council |
| 3/9/2007 | Coastal Neighborhood Council |
| 3/15/2007 | San Pedro Chamber of Commerce |
| 3/16/2007 | Harbor City/Harbor Gateway Chamber of Commerce |
| 3/22/2007 | Harbor City/Harbor Gateway Chamber of Commerce |
| 3/22/2007 | Harbor Gateway Neighborhood Council |
| 3/23/2007 | San Pedro Chamber of Commerce |
| 3/27/2007 | Palos Verdes Peninsula Chamber of Commerce |

**Table 5 (Continued)**

| Date | Agency/Organization |
|---|---|
| 3/28/2007 | Harbor City/Harbor Gateway Chamber of Commerce |
| 3/28/2007 | San Pedro Homeowners United |
| 3/29/2007 | Lomita Chamber of Commerce |
| 4/10/2007 | Harbor City Neighborhood Council |
| 4/10/2007 | Neighborhood Council Review Commission |
| 4/11/2007 | Lomita Chamber of Commerce |
| 4/17/2007 | Central San Pedro Neighborhood Council |
| 4/19/2007 | Fleming Middle School |
| 4/23/2007 | Palos Verdes Peninsula Land Conservancy |
| 4/24/2007 | Marine Mammal Care Center at Fort MacArthur |
| 4/25/2007 | Wilmington Coordinating Council |
| 4/25/2007 | Wilmington Chamber of Commerce |
| 4/25/2007 | Surfrider Foundation, West Los Angeles and Malibu Chapter |
| 4/25/2007 | Heal the Bay |
| 4/26/2007 | Palos Verdes Peninsula Chamber of Commerce |
| 4/27/2007 | Wilmington Community Advisory Committee |
| 4/27/2007 | Richard Henry Dana Middle School |
| 4/30/2007 | Wilmington Middle School |
| 5/3/2007 | Palos Verdes Peninsula Chamber of Commerce |
| 5/3/2007 | Torrance Chamber of Commerce |
| 5/3/2007 | Lomita Chamber of Commerce |
| 5/3/2007 | San Pedro Chamber of Commerce |
| 5/3/2007 | Wilmington Chamber of Commerce |
| 5/15/2007 | Eshelman Avenue Elementary |
| 5/21/2007 | Lomita Chamber of Commerce |
| 5/24/2007 | Santa Monica Baykeeper |
| 5/24/2007 | California Coastkeeper Alliance |
| 5/24/2007 | San Pedro High School |
| 6/4/2007 | Santa Monica Bay Restoration Commission |
| 6/7/2007 | Port of Los Angeles High School |
| 6/25/2007 | Saint John Fisher Elementary School |
| 6/26/2007 | Stephen M. White Middle School |
| 7/2/2007 | Palos Verdes High School |
| 7/17/2007 | Ridgecrest Intermediate School |
| 7/23/2007 | Coalition for a Safe Environment |
| 8/2/2007 | Wilmington Chamber of Commerce |
| 8/23/2007 | Harbor City Neighborhood Council |
| 8/24/2007 | Coastal San Pedro Neighborhood Council |
| 8/27/2007 | Harbor City/Harbor Gateway Neighborhood Council |
| 8/27/2007 | Harbor City |
| 8/28/2007 | Barton Hill Elementary School |
| 8/29/2007 | San Pedro Chamber of Commerce |
| 8/29/2007 | Wilmington Neighborhood Council |

**Table 5 (Continued)**

| Date | Agency/Organization |
|---|---|
| 8/31/2007 | Holy Family Elementary School |
| 9/17/2007 | Los Angeles Harbor College |
| 10/11/2007 | Palos Verdes Peninsula Chamber of Commerce |
| 10/12/2007 | Carson High School |
| 10/29/2007 | Banning High School |
| 11/14/2007 | Harbor Regional Park Advisory Board |
| 11/19/2007 | Torrance Area Chamber of Commerce |
| 12/3/2007 | African American Chamber of Commerce |
| 12/3/2007 | Long Beach Chamber of Commerce |
| 1/8/2008 | South Bay Association of Chambers of Commerce |
| 1/9/2008 | Palos Verdes Peninsula Chamber of Commerce |
| 1/16/2008 | Sierra Club, Los Angeles Chapter |
| 1/28/2008 | Coastal San Pedro Neighborhood Council |
| 2/6/2008 | San Pedro Business Improvement District |
| 2/14/2008 | Harbor Gateway South Neighborhood Council |
| 2/20/2008 | Lomita Chamber of Commerce |
| 2/20/2008 | Harbor City Neighborhood Council |
| 3/18/2008 | Port Community Action Committee |
| 4/10/2008 | Wilmington Chamber of Commerce |
| 4/24/2008 | Harbor Association of Industry and Commerce |
| 5/13/2008 | Central San Pedro Neighborhood Council |
| 6/5/2008 | Harbor City/Harbor Gateway Chamber of Commerce |
| 8/18/2008 | Coastal San Pedro Neighborhood Council |
| 12/3/2008 | San Gabriel Valley COG |
| 3/4/2009 | Gateway Cities COG, Public Works Steering Committee |
| 4/23/2009 | South Bay Cities COG |
| 6/25/2009 | Gateway Cities COG, Public Works Steering Committee |
| 3/15/2011 | JWPCP Community Advisory Committee |
| 5/17/2011 | Palos Verdes Peninsula Land Conservancy |
| 5/25/2011 | Coastal San Pedro Neighborhood Council |
| 5/25/2011 | Wilmington Neighborhood Council |
| 6/1/2011 | San Pedro Chamber of Commerce |
| 6/14/2011 | Palisades Residents Association |
| 6/14/2011 | San Pedro Chamber of Commerce, Economic Policy Committee |
| 6/15/2011 | Rancho Palos Verdes Council of HOAs |
| 6/22/2011 | South Bay COG |
| 6/27/2011 | San Pedro and Peninsula Homeowners Coalition |
| 6/27/2011 | Environment Now |
| 6/28/2011 | Santa Monica Bay Restoration Commission |
| 6/28/2011 | 7th Street Elementary School |
| 6/29/2011 | Heal the Bay |
| 7/5/2011 | Coalition for a Safe Environment |
| 7/6/2011 | Pacific Corridor Community Advisory Committee |
| 7/11/2011 | Northwest San Pedro Neighborhood Council |

**Table 5 (Continued)**

| Date | Agency/Organization |
|---|---|
| 7/12/2011 | Palos Verdes Peninsula Chamber of Commerce |
| 7/12/2011 | Sierra Club |
| 7/14/2011 | Wilmington Chamber of Commerce |
| 7/18/2011 | Coastal San Pedro Neighborhood Council |
| 7/19/2011 | Harbor City/Harbor Gateway Chamber of Commerce |
| 7/20/2011 | Central San Pedro Neighborhood Council |
| 7/20/2011 | Gulf Elementary School |
| 7/28/2011 | Harbor Association of Industry and Commerce |
| 7/28/2011 | Gateway Cities COG , Public Works Steering Committee |
| 7/28/2011 | San Gabriel Valley COG, EENR Committee |
| 7/29/2011 | Rancho San Pedro Residents Advisory Council |
| 8/1/2011 | Surfrider Foundation, Long Beach Chapter |
| 8/17/2011 | Harbor City Neighborhood Council |
| 8/30/2011 | Northwest San Pedro Neighborhood Council, Port Committee |
| 9/6/2011 | South Bay Association of Chambers of Commerce |
| 9/26/2011 | South Bay Latino Chamber of Commerce |
| 9/27/2011 | City of Los Angeles, Angels Gate Park |
| 9/27/2011 | Angels Gate Cultural Center |
| 9/27/2011 | Marine Mammal Care Center at Fort MacArthur |
| 9/27/2011 | Angels Gate Continuation School |
| 9/27/2011 | Los Angeles Unified School District, South Regional HS No. 15 |
| 10/13/2011 | Royal Palms Beach Surfers |
| 10/14/2011 | Los Angeles Unified School District, District 8 |
| 10/18/2011 | Port Community Advisory Committee |
| 10/20/2011 | San Gabriel Valley COG |
| 10/24/2011 | Rolling Hills Prep School |
| 10/29/2011 | Point Fermin Residents Association |

# Notice of Availability

CEQA requires issuance of a notice of availability (NOA) when the draft EIR is made available to the public for review. An NOA must describe the project and its potentially significant environmental impacts such that it enables responsible agencies and interested parties to provide meaningful input. At a minimum, the NOA must include:

- Project description
- Project location
- Probable significant environmental effects
- Specified public review period/deadline and address where written comments may be sent
- Date, time, and location of any public hearings
- Address where documents are available for review

The Sanitation Districts, as lead agency under CEQA, circulated the NOA for the draft EIR to approximately 4,000 stakeholders on February 10, 2012. The NOA specified that comments would be accepted through April 10, 2012, resulting in a 60-day review period, 15 days longer than the 45 days required by CEQA. The NOA included a description of the Clearwater Program goal and objectives. Additionally, the NOA described the specific need for a new JWPCP effluent tunnel and the areas under consideration for its construction. As required by CEQA, the NOA listed the probable significant environmental effects of the recommended alternative; announced the date, time, and location of the public hearings; and provided the locations where documents were available for review. A copy of the NOA for the draft EIR is included at the end of this report as Attachment 6.

The Corps, as lead agency under NEPA, published a NOA for the draft EIS in the Federal Register on February 13, 2012. The NOA for the draft EIS, which contained much of the same information as the NOA for the draft EIR, specified that comments would be accepted through April 10, 2012, resulting in a 57-day review period, 12 days longer than the 45 days required by NEPA. A copy of the NOA for the draft EIS is included at the end of this report as Attachment 7.

# Notice of Completion

CEQA requires that the lead agency file a notice of completion (NOC) with the State Clearinghouse (SCH) at the same time as it provides the NOA. At a minimum, the NOC must include:

- Project description
- Project location
- Address where documents are available for review
- Public review period

The NOC for the draft EIR/EIS was filed as required (reference SCH# 20081010074) and is included at the end of this report as Attachment 8.

# Public Review and Hearings

In accordance with NEPA, but not required by CEQA, the Sanitation Districts and Corps held a joint public hearing on the draft EIR/EIS. The Sanitation Districts held two additional public hearings during the comment period to provide the public with more opportunities to learn about the project and submit formal comments.

Notice of the public hearings was included in the NOAs for the draft EIR and draft EIS. A newspaper advertisement announcing the public hearings was also placed in The Beach Reporter, The Daily Breeze, Impacto, Inland Valley Daily Bulletin, Long Beach Press Telegram, Palos Verdes Peninsula News, Pasadena Star News, San Gabriel Valley Tribune, and Whittier Daily News. A copy of the text as well as copies of all nine advertisements as they actually ran in February 2012 are included at the end of this report as Attachment 9. Notification was also provided on the Clearwater Program website and by press releases to numerous Southern California media outlets. The public hearings were conducted in both English and Spanish. Complete transcripts of the public hearings are included in Appendix 28-A.

Details on the joint public hearing for the draft EIR/EIS are as follows:

Thursday, March 8, 2012 at 6:30 pm
Crowne Plaza Los Angeles Harbor Hotel Center
601 South Palos Verdes Street
San Pedro, California

Details on the public hearings for the draft EIR are as follows:

Tuesday, March 6, 2012 at 6:30 pm
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California

Wednesday, March 7, 2012 at 6:30 pm
Carson Community Center
801 East Carson Street
Carson, California

# Comments on Draft EIR/EIS

The Sanitation Districts and Corps accepted written and oral comments throughout the public review period, which ended on April 10, 2012; however, late comments were accepted as well. A total of 52 comments were received on the draft EIR/EIS. Chapter 28 includes a list of all agencies, organizations, and persons who submitted comments, as well as responses to all comments. Copies of all comments, including transcripts of the public hearings, are included in Appendix 28-A. Furthermore, in accordance with CEQA, responses were provided to all public agencies that submitted comments at least 10 days prior to certification of the final EIR.

**Attachment 1**

# NOTICE OF PREPARATION

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

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www.lacsd.org

STEPHEN R. MAGUIN
Chief Engineer and General Manager

October 10, 2008

File No.: 31-370.10

**To:** Mailing List

**Subject:** NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

**Project Title:** Clearwater Program Master Facilities Plan

**Project Location:** Los Angeles County

**Project Description:** The project consists of the preparation of Clearwater Program Master Facilities Plan (MFP) for the Sanitation Districts of Los Angeles County's (Sanitation Districts) Joint Outfall System (JOS). The JOS encompasses 73 of the 78 cities in the Sanitation Districts' service area, as well as some unincorporated county areas. The MFP will assess the wastewater conveyance, wastewater treatment, solids processing, biosolids management, and effluent management needs of the JOS through the year 2050, and recommend specific improvements to meet those needs. A major component of the MFP will be the possible construction of a new tunnel and ocean outfall to convey treated wastewater from the Sanitation Districts' Joint Water Pollution Control Plant (JWPCP) in Carson to the Pacific Ocean, where it would be discharged 2-7 miles offshore at a depth of approximately 190 feet.

This Notice of Preparation (NOP) has been prepared in accordance with the California Environmental Quality Act (CEQA). Pursuant to CEQA, the Sanitation Districts will be the state lead agency and, due to the scope of the project, will prepare an Environmental Impact Report (EIR). The project description, location, and the potential environmental impacts are contained in the attached materials. The EIR will be prepared jointly with an Environmental Impact Statement (EIS), which will be prepared in accordance with the National Environmental Policy Act (NEPA) for project alternatives that would require any federal approval(s). The U.S. Army Corps of Engineers (Corps) will be the federal lead agency for the project and has concurrently issued a Notice of Intent (NOI) for the preparation of the EIS. It is anticipated that the draft MFP and the draft EIR/EIS will be completed by the end of 2009.

If you are a responsible agency or a trustee agency, the Sanitation Districts are soliciting written comments as to the scope and content of the environmental information, including alternatives, impacts, and mitigation measures, that may be relevant to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by the Sanitation Districts when considering any permits or other approvals for the project. Please provide the name and telephone number of a contact person in your agency with your comments.

If you are an interested party or property owner, you may submit written comments concerning any effects the project may have on your community or your property. Please share this notice with anyone else you feel may be interested in the project. The NOP is also available at www.ClearwaterProgram.org. In addition, the Sanitation Districts and the Corps will receive comments as to the scope of analysis and content of the proposed EIR/EIS at a joint public and agency scoping meeting conducted for both the NOP and NOI. This joint scoping meeting will be held on:

- Thursday, November 6, 2008, at 6:30 p.m., at the Crowne Plaza Los Angeles Harbor Hotel, 601 South Palos Verdes Street, San Pedro, California.

Recycled Paper

The Sanitation Districts will also be conducting one additional agency scoping meeting for the NOP on:

- Thursday, October 30, 2008, at 1:30 p.m., at the Sanitation Districts' Joint Administrative Office, 1955 Workman Mill Road, Whittier, California;

as well as three additional public scoping meetings for the NOP on:

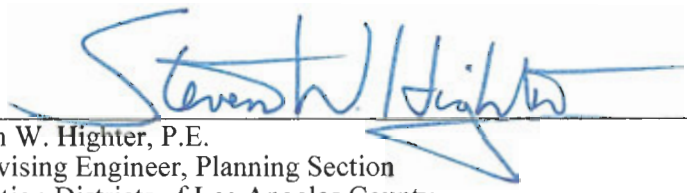
- Wednesday, October 29, 2008, at 6:30 p.m., at the Carson Community Center, 801 East Carson Street, Carson, California;

- Thursday, October 30, 2008, at 6:30 p.m., at the Sanitation Districts' Joint Administrative Office, 1955 Workman Mill Road, Whittier, California; and

- Wednesday, November 5, 2008, at 6:30 p.m., at the Wilmington Senior Center, 1371 Eubank Avenue, Wilmington, California.

Based on the time limits established by CEQA, comments on the NOP must be received no later than 30 days after receipt of this notice. Please submit your written comments to the undersigned at the earliest possible date, but no later than November 14, 2008. If you have any questions regarding the NOP or the scoping meetings, you may call the Clearwater Program information line at (877) 300-WATER.

Date: October 10, 2008



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SANITATION DISTRICTS OF LOS ANGELES COUNTY

CLEARWATER Program

# NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

## 1.0 Introduction

The Sanitation Districts of Los Angeles County (Sanitation Districts) are in the planning stage of the Clearwater Program. The goal of the Clearwater Program is to ensure the continuation of a wastewater management system that is protective of public health and the environment. As part of the Clearwater Program, the Sanitation Districts will be preparing a new master facilities plan (MFP) for the Joint Outfall System (JOS). The MFP will serve to guide the management and development of the JOS through the year 2050 and may result in the implementation of one or more recommended projects.

This Notice of Preparation (NOP) has been prepared pursuant to the requirements of the California Environmental Quality Act (CEQA) to notify Responsible and Trustee Agencies that an Environmental Impact Report (EIR) will be prepared to assess potential impacts of the project. The EIR will be prepared jointly with an Environmental Impact Statement (EIS) that will meet the requirements of the National Environmental Policy Act (NEPA). The U.S. Army Corps of Engineers (Corps) will be the federal lead agency under NEPA, and a separate Notice of Intent has been prepared for the EIS.

## 2.0 Background

The Sanitation Districts function on a regional scale consisting of 24 independent special districts serving the wastewater and solid waste management needs of approximately 5.3 million people in Los Angeles County. The Sanitation Districts' service area covers approximately 800 square miles and encompasses 78 cities and unincorporated territory within the county (Figure 1, Regional Location). The 24 separate districts work cooperatively under a Joint Administration Agreement with one administrative staff headquartered near the city of Whittier.

Seventeen of the districts located in the metropolitan Los Angeles area participate in the Joint Outfall Agreement, which provides for combined investment in wastewater conveyance and treatment facilities. These 17 districts are collectively known as the Joint Outfall Districts, which provide for operation and maintenance of a regional, interconnected system of facilities called the Joint Outfall System (JOS). The service area of the JOS encompasses 73 of the 78 cities in the Sanitation Districts' service area, as well as some unincorporated county areas. Figure 2 shows the JOS service area, the Joint Outfall Districts' boundaries, and the location of wastewater treatment plants.

The Sanitation Districts currently utilize two onshore tunnels and four offshore ocean outfalls to convey effluent from their Joint Water Pollution Control Plant (JWPCP) in the city of Carson to the Pacific Ocean. The two tunnels were constructed in 1937 and 1958 and have not been inspected in over 50 years. Inspection of the tunnels is not possible due to their length, limited access, lack of separation between the tunnels, and constant flow through the tunnels.

**Figure 1: Regional Location of Entire Service Area of the Sanitation Districts of Los Angeles County**

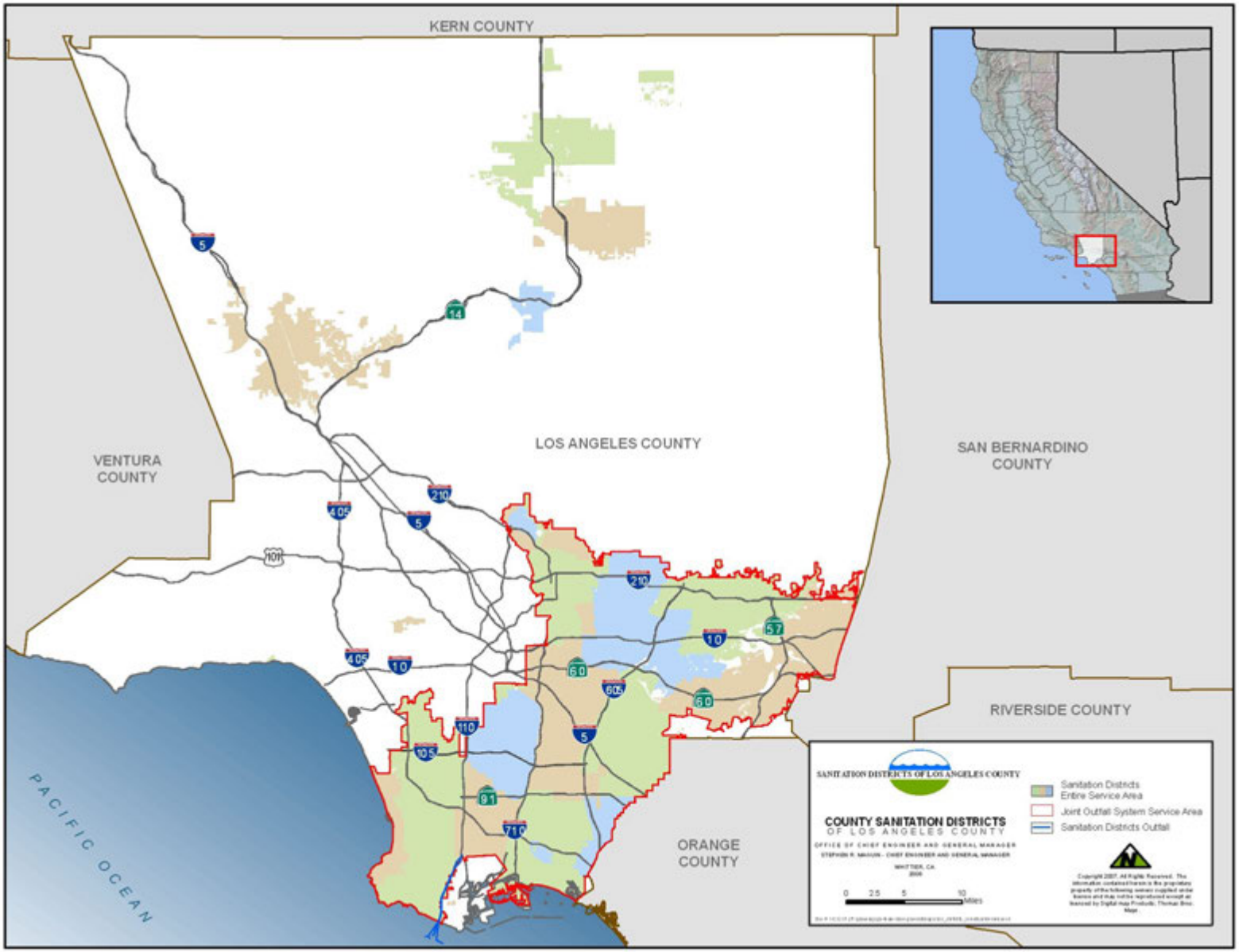
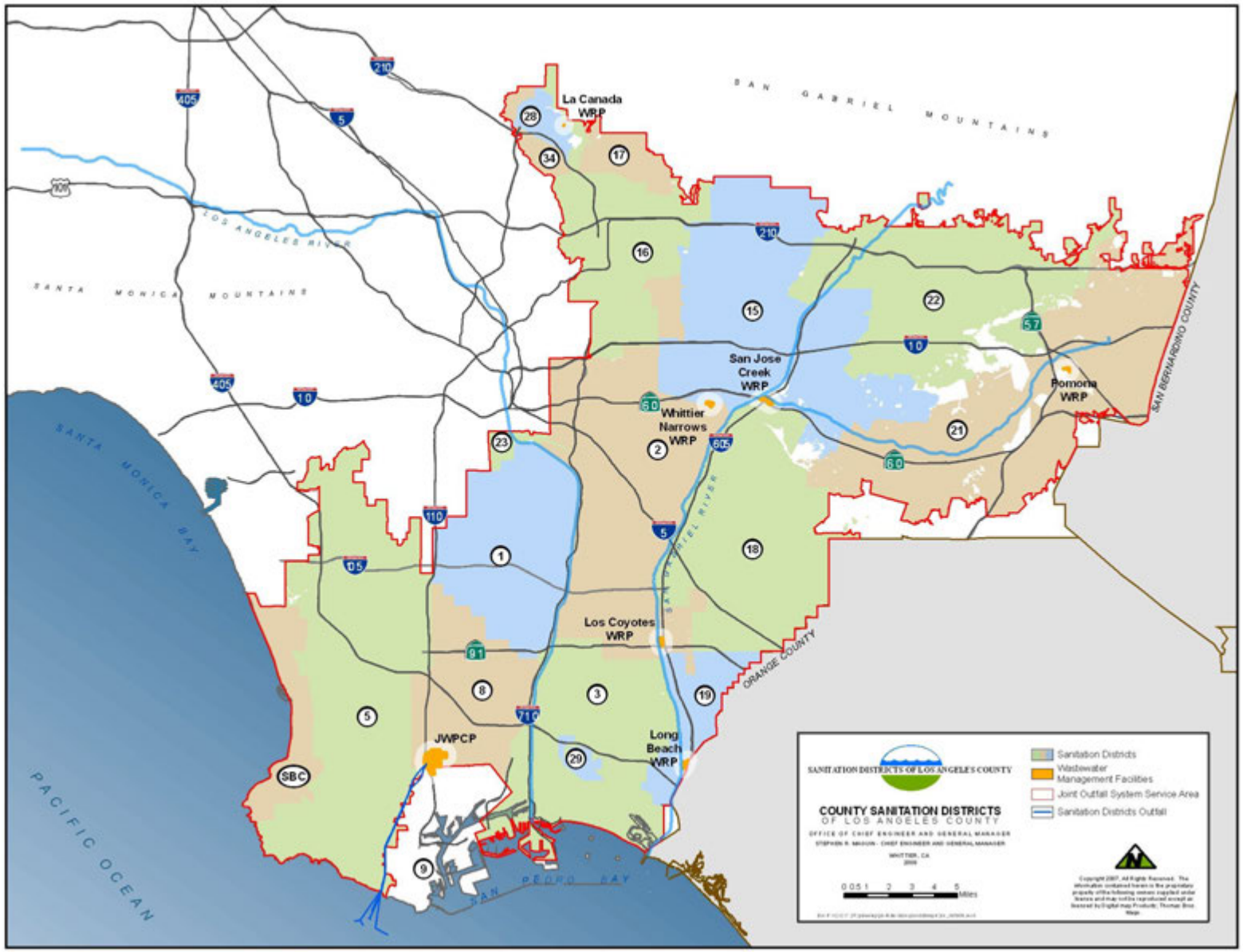


**Figure 2: Existing Joint Outfall System Facilities**



The Sanitation Districts are in the initial stages of preparing a new MFP for the wastewater management facilities in the JOS service area. The JOS facilities currently serve approximately 5 million people and treat an average of approximately 450 million gallons of wastewater per day. The MFP will address wastewater conveyance and treatment, solids processing, biosolids management, and effluent management. A major component of the MFP will be to evaluate, at a project level, the possible construction of a new tunnel and ocean outfall to discharge treated wastewater from the JWPCP.

## 3.0 Need for Project

The MFP is necessary to ensure adequate JOS wastewater system capacity and reliability through the year 2050. Specifically, the proposed plan in the MFP would meet the following needs and objectives:

- Provide adequate system capacity to meet the needs of the growing JOS population
- Provide a long-term solution for meeting water quality requirements set forth by regulatory agencies
- Provide a means of inspecting, maintaining, repairing, rehabilitating, and replacing the aging infrastructure of the JOS to ensure overall reliability
- Provide a wastewater treatment and effluent management program that accommodates and promotes emerging recycled water reuse and biosolids beneficial use opportunities

## 4.0 The Clearwater Program Master Facilities Plan

### 4.1 Program-Level Components

The MFP and the associated EIR will be prepared concurrently. The MFP and EIR will include alternatives comprised of separate, individual components that together comprise a recommended plan of activities. The five individual components that will be examined in both the MFP and the EIR include:

- Wastewater conveyance and treatment
- Solids processing
- Biosolids management
- Water reclamation plant (WRP) effluent management
- JWPCP effluent management

#### 4.1.1 Wastewater Conveyance and Treatment Component

Trunk sewers form the core of the Sanitation Districts' conveyance system within the JOS. These are typically large-diameter sewers specifically sized to transport wastewater from other Sanitation Districts' smaller trunk sewers and/or local sewers. These large trunk sewers convey the wastewater downstream toward a JOS wastewater treatment facility. Wastewater flows will generally increase proportionately as population increases; therefore, sections of the conveyance system may need to be relieved or enlarged to accommodate the future flows.

The conveyance system options under consideration in the MFP could include:

- Repair and rehabilitation of existing lines based upon current conditions

- Hydraulic relief based on projected flow increases
- New interceptors to convey flow between WRP tributary areas
- Changes to optimize flow distribution within the system

The JOS is comprised of six upstream WRPs (Pomona, Whittier Narrows, San Jose Creek, Los Coyotes, Long Beach, and La Cañada) and the downstream JWPCP that treat wastewater. The location of these facilities are shown on Figure 2. Potential treatment plant modifications related to projected future conditions are driven by improvements to (1) accommodate future flows generated within the JOS and (2) meet increasingly stringent regulatory requirements.

A variety of approaches could be employed to meet projected flow increases and comply with potential future regulations. These will be evaluated in the development of conceptual treatment options and the ultimate formulation of comprehensive alternatives. Options could include:

- Expansion of the JWPCP – all or a portion of future flow increases could be directed to the JWPCP
- Expansion of the WRPs – all or a portion of future flow increases could be directed to the WRPs
- New plant – the potential siting of a new treatment plant, which could be used to reduce the need for conveyance system improvements or to enhance the potential for reclamation within the system, will be evaluated

The conveyance system component will be interrelated with the wastewater treatment facilities component. This is because some decisions regarding the possible expansion of upstream WRPs and the possible expansion of the downstream JWPCP may impact certain hydraulic requirements of the conveyance system. The type of conveyance system options under consideration within the MFP could include:

- Additional interceptor sewers
- Flow equalization/storage systems
- Dedicated solids and brine transport lines
- Facilities to enhance flow diversion capabilities

### 4.1.2 Solids Processing Component

Solids are generated as a byproduct of wastewater treatment and purification. As the population within the JOS increases, the wastewater flows and solids generated by treatment will increase as well. Solids processing consists of stabilization using anaerobic digesters and thickening systems to change a pumpable liquid to a truckable solid material. Within the JOS, all solids generated by treatment are currently processed at the JWPCP. This includes the solids generated at the upstream WRPs. The MFP will evaluate future options for solids processing that could include:

- Continued centralized solids processing at JWPCP
- Solids processing at the WRPs
- Centralized solids processing at a facility other than the JWPCP

### 4.1.3 Biosolids Management Component

Biosolids are the finished product of solids processing. The biosolids represent a valuable organic material with the potential for reuse in a variety of applications. The Sanitation Districts' preferred approach is beneficial reuse of biosolids. Future biosolids reuse/disposal practices will be influenced by potentially more stringent regulatory requirements, new development taking place within areas that were considered remote and once acceptable for biosolids reuse, and future restrictions imposed by local jurisdictions. This will likely result in a decrease in the number of privately operated biosolids management facilities with which the Sanitation Districts could contract for services. In order to remedy this situation, the Sanitation Districts have taken steps to provide for a sufficient amount of long-term biosolids management capacity, which will be evaluated and discussed in the MFP. Some biosolids management options could include:

- Continuation of existing management – beneficial use and landfill disposal
- Landfill disposal – all biosolids
- Beneficial use – all biosolids

### 4.1.4 WRP Effluent Management Component

The term "effluent" refers to the treated product water from any of the six WRPs or the JWPCP. The options for managing effluent from the WRPs could include:

- Reclamation/reuse
- Inland discharge to a water body
- Combination of reclamation/reuse and inland discharge

It is anticipated that as water demands within the JOS service area continue to increase and the procurement of reliable, cost-effective new potable supplies becomes more challenging, the use of reclaimed water will continue to increase. It is likely that as the use of reclaimed water increases, the diversity of applications will similarly increase. The Sanitation Districts will continue to support and promote water-recycling programs and work cooperatively with water purveyors to meet future demands.

The six upstream WRPs produce more reclaimed water than is currently being reused. The demand for reclaimed water also varies throughout the course of a year with the highest quantities being reused in the spring and summer months. Reclaimed water that is not reused is discharged to inland water courses (e.g., the San Gabriel River). In the future, these inland discharges will continue to be an integral part of an overall strategy for effluent management.

### 4.1.5 JWPCP Effluent Management Component

Effluent from the JWPCP is more salty making it less desirable for reuse, but it is highly suitable for ocean discharge. The effluent is discharged to the ocean via the existing JWPCP tunnel and ocean outfall system, which consists of two tunnels and four outfall pipes/diffusers. The specific concerns relative to the existing tunnel and ocean outfall system include capacity, condition, and reliability. The MFP will provide for sufficient capacity to meet projected flows and provide for the ability to inspect and repair, as necessary, the existing tunnel and ocean outfall system.

Options for addressing capacity and/or allowing for the inspection and repair of the existing tunnel and ocean outfall system could include:

- Building a new ocean discharge system to convey some or all of the effluent flows
- Temporary discharge to points other than the existing tunnel and ocean outfall system
- Beneficial reuse of some or all of the effluent flow

## 4.2 Project-Level Components

Specific projects may result from the evaluation of the component areas identified above. These projects will be fully analyzed in the MFP and EIR. It is unknown how many projects may be identified in the MFP, but one project that will be evaluated is the need for a new tunnel and ocean outfall system as part of the JWPCP Effluent Management component area.

The two existing tunnels connecting the JWPCP and White Point were constructed in 1937 and 1958. The four ocean outfalls were constructed in 1937, 1947, 1956, and 1966. The tunnels have not been inspected in nearly 50 years. Inspection of the tunnels is not possible due to their length, limited access, lack of separation between the tunnels, and constant flow through the tunnels. The inability to inspect and repair, as necessary, this critical element of the JWPCP's effluent management system is a serious concern. The construction of a new tunnel and ocean outfall system will be evaluated at a project level within the MFP.

The MFP and EIR will evaluate the location, construction, and operation of a new tunnel and ocean outfall system. The Sanitation Districts and/or their consultants have begun performing technical feasibility and preliminary environmental analyses in order to develop specific alignment alternatives that will be included in the MFP and studied in detail in the EIR. The study area for a new tunnel and ocean outfall is shown on Figure 3.

The components of a new tunnel and ocean outfall that will be evaluated include:

- Onshore Alignments
- Tunnel Access/Construction Shaft Sites
- Marine Alignments
- Diffuser Locations

### 4.2.1 Onshore Alignments Component

Some of the considerations for establishing onshore alignments for a tunnel include, but are not limited to, the use of long continuous streets and public rights of way, a minimum turning radius of 1,000 feet, and the availability of a nearby construction shaft site – preferably near the coast. Streets that generally run north-south, such as Wilmington Boulevard, Frigate Avenue, Figueroa Street, Gaffey Street, Pacific Avenue, and Western Avenue, may be considered for alignments. Potential onshore alignments are shown on Figure 4. A tunnel would be constructed well below ground (up to approximately 200 feet) and would not require the streets to be taken out of service.

### 4.2.2 Tunnel Access/Construction Shaft Sites Component

Construction shaft sites would require approximately 4-8 acres of land that is relatively flat and not too irregularly shaped (e.g., extremely narrow). The construction shaft, approximately 60 feet in diameter, would be the place where equipment and supplies would be sent into a tunnel, and where excavated materials would be removed. The construction shaft site would require access to a road or other means of transport suitable for bringing materials in and taking excavated material away. In

order to minimize construction impacts to residences and businesses, public lands such as open space, government property, and port property would be preferred for construction shaft sites. Smaller shaft sites may be constructed to provide access for ventilation and labor. Fourteen locations have been identified as meeting the minimum requirements for a construction shaft site (Figure 4).

### 4.2.3 Marine Alignments Component

The marine alignment would consist of connecting the onshore alignment with the diffuser location up to 7 miles offshore. The marine alignment would consist of an extension of the onshore tunnel to the diffuser location or a combination of a tunnel and a seafloor pipeline to the diffuser location.

### 4.2.4 Diffuser Locations Component

The diffuser site, where effluent is discharged into the ocean, would be located at a distance and depth that equals or exceeds that of the Sanitation Districts' existing diffusers. The diffuser site must also be located on a seismically stable part of the continental shelf. Alignments for the ocean outfalls north and south of the study area were not considered due to the presence of existing large ocean sewer outfalls for the city of Los Angeles and Orange County, respectively. Three areas have been identified within the study area as meeting the minimum requirements for a diffuser location (Figure 5). The length of the diffusers will be determined by the amount of flow expected to pass through them. The length of a new diffuser could be as long as approximately 9,000 feet. To achieve comparable dilution of the effluent in the ocean as the existing diffusers, new diffusers would need to be at nearly the same depth as the existing diffusers, or a depth of approximately 190 feet.

## 4.3 Proposed Plan and Alternative Selection Process

The Sanitation Districts have not yet developed final alternatives for inclusion in the MFP or the EIR. A process will be used to develop, evaluate, and screen a broad range of alternatives to arrive at a reasonable range of alternatives that will be analyzed in the EIR.

Multiple options will first be developed for each of the component areas, which will then be screened for technical, cost, logistical, institutional, and environmental considerations. The component options that pass this screening will then be combined into logical, system-wide MFP alternatives that include both program-level and project-level options. These MFP alternatives will be analyzed in the EIR, which will also identify the recommended alternative. The EIR will result in the selection of a recommended plan of action, which the Sanitation Districts' Board of Directors will decide to approve or reject.

**Figure 3: Project Study Area**

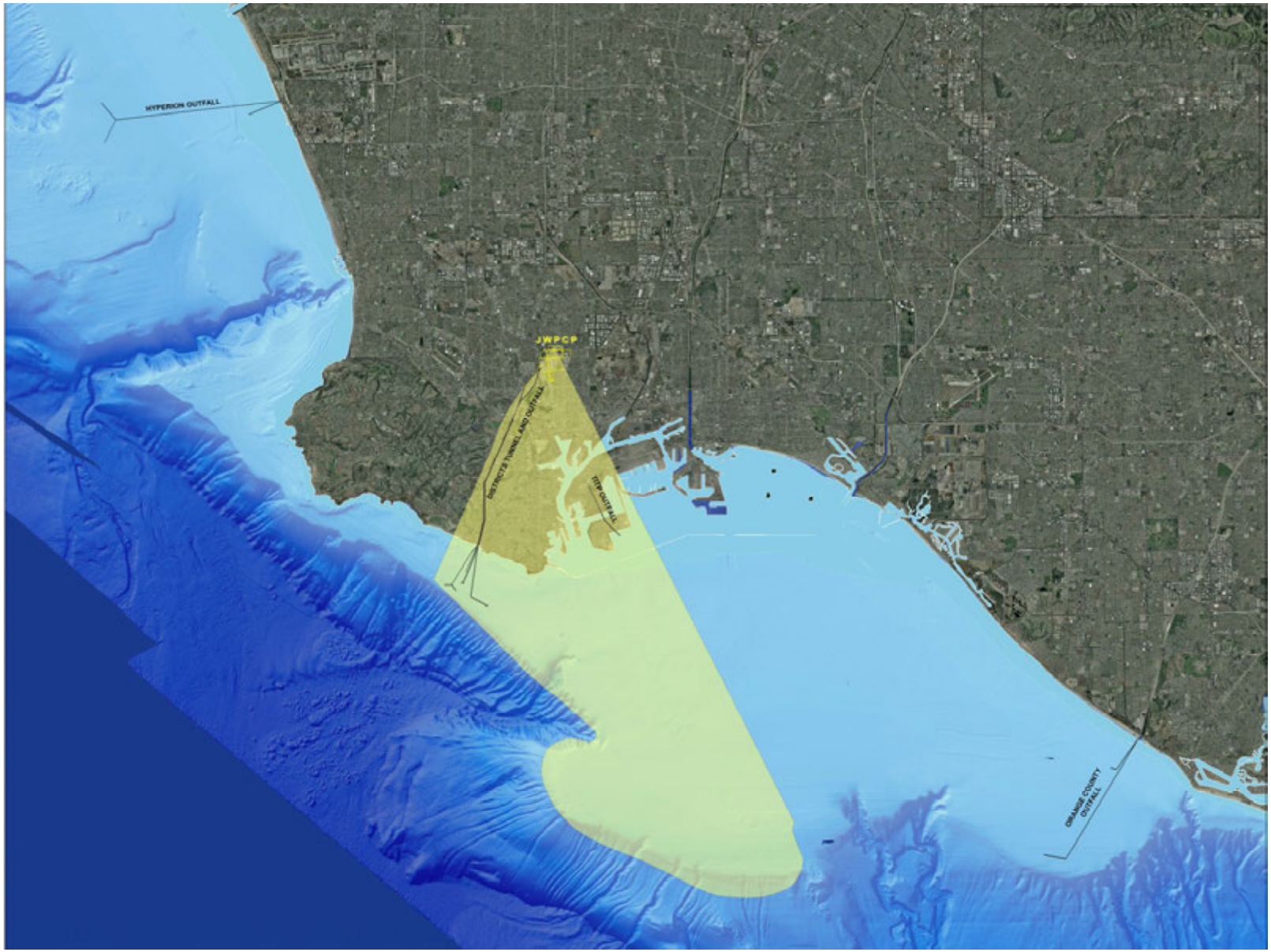


**Figure 4: Potential Onshore Alignments and Shaft Sites**

**Figure 5: Potential Diffuser Locations**

# 5.0 Environmental Issues

## 5.1 Overview

This section presents a preliminary listing of potential environmental issues to be addressed in the EIR. The environmental issues to be addressed will be finalized after comments on the NOP are received.

The summary below provides a general discussion of potential environmental impacts of the MFP components that will be addressed in the EIR and the approaches used to analyze the potential impacts. The EIR will determine whether these impacts could actually occur, their level of significance, and proposed feasible mitigation measures to reduce significant impacts.

## 5.2 Aesthetics

### Issues

Potential impacts could occur both during construction and after facilities are built and operating. Issues associated with aesthetics in relation to constructing new or altering existing MFP components could include:

- Obstructing high-quality or important views of the landscape either during construction or operation of permanent MFP components
- Increasing to a noticeable level the amount of new light and glare visible from important viewing areas either during construction or operation of permanent MFP components
- Constructing permanent MFP components visually incongruous with their surroundings
- Constructing permanent MFP components in the landscape visible from and incongruous with recreation facilities or open space areas that may be accessible to the public presently or in the foreseeable future
- Potential impacts could occur during construction of a JWPCP tunnel and ocean outfall project. However, once the project is constructed, a tunnel would be below ground surface and the outfall would be on the bottom of the Pacific Ocean. Therefore, there would be no aesthetic impacts associated with operation of a JWPCP tunnel and ocean outfall system.

### Approach

Established methods for visual impact assessment developed and used by the Sanitation Districts and the Corps will be used to identify potential visual impacts of the MFP components. One methodology would be to use the Federal Highway Administration (FHWA) Methodology for visual impact assessment. The FHWA visual assessment system uses a qualitative, descriptive approach that is based on identifying the relative levels of vividness, intactness, and unity in the surrounding landscape and assessing the levels of change of these components anticipated to result from proposed project features.

The methodology would assume that impacts occurring during construction would be relatively short term, with the exception of vegetation removal, and would end with repair of damaged areas and cleanup of construction areas, including the full removal of staging areas, equipment storage areas, and temporary structures. In addition, construction activities would introduce visual elements into

the landscape that would contrast with and possibly reduce visual quality and character; therefore, it will be assumed that no beneficial impacts would occur during construction.

Key elements of the approach to visual assessment could include:

- Identifying the viewshed of the proposed MFP through GIS-based elevation analysis refined by field surveys
- Identifying the visible physical changes to the natural and manmade environment including, the addition of new components into the viewshed (temporary and permanent), and the removal of other components from the view (i.e., blocking of views)
- Identifying the compatibility of the visible physical changes with the surrounding visual environment
- Identifying the visibility to viewers of physical changes within the viewshed, including types and relative number of viewers and their likely sensitivity to visual changes
- Identifying the significance of the aesthetic impact, based on the visibility of the physical changes, the compatibility of the changes with the existing visual environment, and the likely viewer reaction to the changes
- Identifying the visual impact on important visual resources
- Identifying the compatibility of visible physical changes with existing visual resource policies
- Identifying the effects of the project components on the existing light, glare, shadow, and shade environments

## 5.3 Agricultural Resources

### Issues

Potential construction and operational impacts could relate to the operation of the biosolids management component of the MFP. In the past, the Sanitation Districts have had agreements with agricultural operators outside of Los Angeles County to beneficially reuse the biosolids on agricultural land. This method of biosolids management has potential agricultural impacts.

There would be no agricultural impacts related to the construction or operation of the proposed JWPCP tunnel and outfall project. This component of the MFP includes a below ground tunnel under existing urban land uses and an outfall and diffuser located on the bottom of the Pacific Ocean. These areas completely lack agricultural uses.

### Approach

Agricultural impacts associated with biosolids management will be analyzed on a program-level because the management plan would be programmatic in nature. Existing data and information for each topic will be evaluated and issues and potential impacts will be described. MFP information and data will be compared with significance criteria to identify impacts that meet or exceed applicable criteria.

## 5.4 Air Quality

### Issues

Potential air quality issues associated with the MFP involve both construction and operational air emissions and conformity with the South Coast Air Quality Control Board (SCAQMD) air quality management plan. These issues could include potential air emissions from:

- Construction equipment exhaust
- Construction employee commute travel
- Ground disturbance during construction
- Use of digester gas
- Vehicle trips associated with any increases in employment
- Release of volatile organic compounds (VOCs) from plant operations
- Increased JWPCP solids processing and biosolids management

Potential air quality issues associated with a JWPCP tunnel and ocean outfall project involve only construction air emissions and conformity with the SCAQMD air quality management plan. Once a JWPCP tunnel and ocean outfall are in place below the ground surface, there would be no additional operational emissions from this component of the MFP.

### Approach

Analysis of construction and operational related emissions could include:

- Criteria pollutants of greatest concern in the South Coast Air Basin
- Greenhouse gases and climate change
- Estimates of the type and number of construction equipment
- Estimates of emission factors
- Comparison between the construction and operation emission estimates to the federal conformity thresholds established by the EPA for the South Coast Air Basin

The emission estimates and the determination of the significance and mitigation of those estimates will be prepared in accordance with the guidance contained in the SCAQMD *CEQA Air Quality Handbook* (as updated per the SCAQMD website), *Localized Significance Threshold Methodology for CEQA Evaluations*, and *Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology* guidance documents. In addition, the Port of Los Angeles Clean Air Action Plan will provide guidance to develop mitigation measures where necessary.

Existing air emissions reports, including prepared risk assessments for the MFP components, will be used if available. If air quality sampling or monitoring has been conducted specifically for a source, resulting data will be used to estimate emissions. If direct source testing data are unavailable, emissions factors developed by the Pooled Emissions Estimation Program (PEEP) and the Joint Emissions Inventory Program (JEIP) will be used to estimate air emissions based on influent water quality. If PEEP or JEIP emission factors are not available, published emission factors prepared by regulatory agencies such as SCAQMD and EPA will be used for sources in question.

## 5.5 Biological Resources (Terrestrial)

### Issues

Refer to Section 5.11 for impacts to the marine biological environment.

The developed lands that characterize the JOS service area retain little to none of the natural biological communities that once existed. Issues regarding terrestrial biological resources during construction and operations could include:

- Changes to wildlife habitat, disruption of natural movement corridors, or fragmentation or isolation of wildlife habitats
- Disturbance or displacement of wildlife during construction
- Effects on federally listed or state-listed threatened or endangered wildlife species
- Effects on other special-status wildlife species, including state species of special concern and candidate species for federal listing as threatened or endangered
- Effects on wetland and riparian wildlife habitats, or other wildlife habitats that have declined regionally
- Effects on sensitive creek and water resources adjacent to the six WRPs
- Effects on nests of migratory birds protected under the Migratory Bird Treaty Act
- Effects on sensitive botanical species and/or critical habitat
- Effects on existing habitat conservation plans
- Construction in an Significant Ecological Area (Whittier Narrows WRP)

The majority of the facilities associated with a JWPCP tunnel and ocean outfall project would be constructed below ground. Therefore, the main concern with respect to terrestrial biology for this component of the MFP will be sensitive resources associated with the construction and access shaft sites for a tunnel at the JWPCP and other locations.

### Approach

The following information will be reviewed and incorporated to analyze the effects of the proposed MFP components on sensitive terrestrial biological resources:

- Existing data from literature reviews
- Existing data on special-status wildlife locations and species (e.g., California Department of Fish and Game's Natural Diversity Database)
- Constraints-level surveys of the various MFP components

The effects of the MFP on botanical resources will be assessed based on the approximate extent of the resource affected. Because most of the wastewater treatment facilities are in developed landscapes, extensive sensitive botanical resources are not expected at these sites.

These same sources of information will be reviewed for a JWPCP tunnel and ocean outfall project; however, specific field surveys of the JWPCP and tunnel and ocean outfall shaft sites will be conducted for the more detailed analysis of the project-specific EIR/EIS. The construction and operational related impact analysis for the MFP components and a JWPCP tunnel and ocean outfall project could include:

- Identifying impacts from construction noise, light, dust, etc. on adjacent sensitive resources

- Identifying major constraints to the development or expansion of existing WRP facilities
- Identifying impacts through removal of species
- Identifying impacts through removal of sensitive or critical habitat
- Identifying impacts through removal of protected resources (e.g., wetlands)

## 5.6 Cultural Resources

### Issues

Possible disturbances to terrestrial cultural resources could result from groundbreaking activities related to construction of new or alteration of existing JOS facilities. Issues regarding cultural resources during construction activities could include:

- Disturbance of known or unknown archeological sites, paleontological resources, and/or human remains where groundbreaking activities occur
- Disturbance or alteration of structures with historical importance

For the program EIR there will likely be no impacts to marine submerged cultural resources since the MFP components primarily exist on land.

Potential disturbances to cultural resources due to a JWPCP tunnel and ocean outfall project include terrestrial and marine disturbances. Disturbances to terrestrial cultural resources could result from groundbreaking activities related to alteration of structures with historical significance at the shaft sites to a tunnel at the JWPCP and other locations. Disturbances to marine cultural resources such as prehistoric sites, prehistoric artifacts, historic sites (e.g., shipwrecks, downed aircraft and other vessels), and historic artifacts (e.g., cargo, anchors) could result from construction of offshore tunnel risers, seafloor pipelines, or the diffuser structure. Potential disturbances specific to a new tunnel and ocean outfall could include:

- Direct damage or removal of prehistoric sites/artifacts or historic sites (e.g., shipwrecks, downed aircraft) and/or isolated historic artifacts

### Approach

Information regarding terrestrial cultural resources will be obtained from:

- California archaeological inventory at the University of California, Los Angeles
- Archeological inventory
- National Register of Historic Places
- California historical landmarks
- Points of historical interests

The MFP is subject to compliance with the CEQA guidelines for cultural and historical resources. Additionally, any use of federal funding for a project, such as SRF loans (partially funded by the EPA), must comply with Section 106 of the federal National Historic Preservation Act (NHPA). Therefore, historical resources for the MFP will need to be evaluated under criteria for both federal and state designations, the National Register of Historical Places (NRHP) and the California Register of Historical Resources (CRHR).

Following the completion of background research and architectural inventory, a historical resource evaluation report will be prepared that will provide historic context, identify impacts, and evaluate significance. CEQA guidelines (Section 106), NEPA guidelines, and the Advisory Council on Historic Preservation Procedures for the Protection of Historic and Cultural Properties will be used to make management recommendations for any impacts.

Information regarding marine cultural resources will be obtained from:

- California state underwater archeologist
- National Oceanic and Atmospheric Administration's (NOAA) Automated Wreck and Obstruction Information System (AWOIS)
- California State Lands Commission (CSLC) database of shipwrecks
- Magnetometer and side scan sonar data for shipwrecks
- Review of previous cultural resource investigations and consultation with local informants

Federal status regarding the potential impact to submerged cultural resources include Section 106 of NHPA, NEPA, the Archaeological Resources Protection Act of 1987, the Advisory Council on Historic Preservation Procedures for the Protection of Historic and Cultural Properties, and the Abandoned Shipwreck Act of 1987. Submerged cultural resources will be identified within the general proximity of a JWPCP tunnel and ocean outfall project and a determination will be made as to site significance.

## 5.7 Geology and Soils

### Issues

Issues associated with geologic, seismic, and soil hazards involve construction and operation of new or alteration of existing MFP components, including upgrading or increasing capacities of conveyance facilities, wastewater treatment plants, effluent management, solids processing, and biosolids management facilities, could expose people and property to geologic hazards (e.g., landslides, ground failure, earthquakes), as well as could affect:

- Soil stability conditions
- Soil erosion rates
- Topography
- Siltation or deposition in inland surface waters

A deep tunnel for a JWPCP tunnel and ocean outfall could encounter San Pedro Formation sands in the onshore reach between the JWPCP and the coast, and Repetto and Monterey Formations in the offshore reach. Therefore, a JWPCP tunnel and ocean outfall project could result in similar impacts as the MFP components to geology and soils. People and property could be exposed to geologic hazards (e.g., landslides, ground failure, and earthquakes). Additional issues associated with geologic and soil hazards regarding the construction and operation of a JWPCP tunnel and ocean outfall could include:

- Vibration
- Damage to tunnels from seismic activity
- Damage to tunnels from differential settling and expansive soils
- Seafloor instability

- Surface settlement
- Sinkhole formation
- Landslides

### Approach

Data gathered by a geotechnical consultant will be reviewed and summarized. Based on this baseline data, impacts of the MFP components will be analyzed using CEQA criteria and thresholds. In addition, preliminary designs developed by the engineering team for a JWPCP tunnel and ocean outfall will be analyzed regarding alignment and specific geology and potential geologic hazards.

## 5.8 Hazards and Hazardous Materials

### Issues

Potential issues related to hazards and hazardous materials associated with the MFP could include:

- Acts of terrorism
- Hazards in soils from previous land uses during construction and operation (i.e., maintenance) of JOS facilities
- Hazards in groundwater from previous land uses during construction and operation (i.e., maintenance) of JOS facilities
- Hazards associated with chemicals used to operate JOS facilities (e.g., chlorine)
- Accidental release of hazardous substances used by (e.g., chlorine) or originating from (e.g., untreated effluent) JOS facilities sites

A JWPCP tunnel and ocean outfall would include constructing vertical shafts to a tunnel at the JWPCP and other locations. Potential issues related to hazards and hazardous materials associated with JWPCP tunnel and ocean outfall construction could include:

- Hazards associated with stockpiling excavated tunnel material including soils
- Hazards associated with loading the excavated tunnel material
- Hazards associated with transporting the excavated tunnel material
- Hazards associated with treating, reusing, and disposing of the excavated tunnel material
- Hazards associated with known contamination plumes or contaminated sediment in the ocean (e.g., DDT)

### Approach

Potential hazards will be evaluated and assessed by reviewing Phase I Environmental Site Assessments. The Phase I Assessments will be conducted in accordance with the ASTM International Standard E 1527-05 by the geotechnical consultant for a JWPCP tunnel and ocean outfall. In addition, an evaluation of potential impacts by hydrocarbon compounds or gases associated with the Wilmington Oil Field will be conducted by reviewing the data collected by the geotechnical consultant and/or from reviewing documents from the California Division of Oil, Gas, and Geothermal Resources, and site-specific reports.

## 5.9 Hydrology, Water Quality, and Public Health

### Issues

Issues associated with hydrology, water quality, and public health could be related to the wastewater conveyance and treatment, effluent management, solids processing and biosolids management components of the MFP.

The potential hydrology issues associated with the MFP could include:

- FEMA-identified flood plains
- Existing stormwater infrastructure
- Alteration of surface water flow pre- and post-construction
- Changes in groundwater flow and recharge pre- and post-construction
- Potential impacts from mudflows or seiches
- Impacts on local surface water bodies

The potential water quality issues associated with the MFP could include:

- Possible surface water quality impacts from ammonia, algae blooms, or other causes in the San Gabriel River and its tributaries
- NPDES permit compliance
- Transport and fate of any toxic compounds if present in effluent and biosolids and potential impacts on groundwater or surface water quality
- Potential exposure to pathogens and toxic substances from activities associated with biosolids management

All potential issues regarding marine hydrology, water quality, and public health related to a JWPCP tunnel and ocean outfall are discussed under Section 5.11, "Marine Environment."

Potential non-marine hydrology issues related to a JWPCP tunnel and ocean outfall could include:

- Encounter contaminated groundwater while tunneling
- Changes in groundwater flow and recharge pre- and post-construction

### Approach

The following existing information will be reviewed to analyze the impacts of the MFP to hydrology, water quality, and public health:

- Sanitation Districts' JOS 2010 Master Facilities Plan
- Los Angeles County General Plan
- Relevant reports from the RWQCB
- Relevant reports from the U.S. Geological Survey
- Relevant reports from the California Department of Water Resources

Relevant federal, state, and local regulations and agencies will be described including provisions of the federal CWA, the state Porter-Cologne Water Quality Control Act, and the permitting and regulatory authority of the RWQCB.

The hydrologic setting will be characterized by the following resources in or near the MFP area:

- Existing drainage patterns
- Existing National Park Service wild and scenic rivers
- Existing FEMA floodplains
- Local groundwater levels and flow patterns
- The general hydrology of local or potentially affected surface water bodies, including San Jose Creek, the San Gabriel River (and tidal prism), Coyote Creek, and the Los Angeles River
- The general water quality of local or potentially affected surface water bodies, including San Jose Creek, the San Gabriel River (and tidal prism), Coyote Creek, and the Los Angeles River

Field visits will be conducted as part of the evaluation. Surface and groundwater quality conditions will be characterized qualitatively, and, as necessary, quantitatively. Any existing water quality impairments in the local or potentially affected water bodies will be discussed.

Project activities associated with the construction and operation of a JWPCP tunnel and ocean outfall that could potentially result in upland hydrologic or water quality impacts will be described. Impacts will be determined based on the duration, extent, and type of project activity and through a comparison to the hydrology- or water quality-related existing conditions.

## 5.10 Land Use and Planning

### Issues

Issues associated with land use and planning result from construction of new facilities related to the MFP components. Issues associated with these components could include:

- Compatibility with adjacent land uses or zoning designations
- Consistency with relevant land use policies
- Access to adjacent land during new construction or repairs of existing wastewater conveyance facilities

Other land use issues are associated with operation of new JOS facilities. For example, any increased solids processing and biosolids management, as well as any expansions of the wastewater treatment plants, will be examined for consistency with local land use policies.

Issues associated with land use and planning result from construction of a JWPCP tunnel and ocean outfall project, as well as some operational issues. Issues associated with this could include:

- Shaft site construction, operation, and maintenance

### Approach

The evaluation will provide an analysis of the MFP components compatibility with nearby land uses and consistency with relevant local and regional plans and policies. It will include documentation of the MFP's consistencies with relevant plans and programs and any inconsistencies will be identified. Specific attention will be paid to impacts on the character and integrity of surrounding sensitive land uses. A plan-to-plan analysis will be conducted that will evaluate the MFP in terms of its respective goals and policies. Zoning inconsistencies will be identified.

## 5.11 Marine Environment (Marine Hydrology, Water Quality, Public Health, and Biological Resources)

### Issues

Very few program components of the MFP have the potential to impact the marine environment. The effluent management component (i.e., releasing treated effluent into water bodies) is the component that could impact resources. Potential construction and operational marine environment impacts associated with effluent management could include:

- Changes in diversity or number of fish or shellfish species in the San Gabriel River tidal prism
- Deterioration of existing fish or shellfish habitat in the San Gabriel River tidal prism
- Reduction of the number of unique, rare, or endangered species in the San Gabriel River tidal prism

A JWPCP tunnel and ocean outfall project could result in construction and operational impacts on the marine environment. Construction of the project would take place via tunneling, and, therefore, marine-related construction impacts would be limited to the location of offshore tunnel risers, seafloor pipelines, and diffusers on the bottom of the Pacific Ocean. Furthermore, oceanographic processes, such as currents and temperature stratification, will influence the discharge of effluent once the outfall is operational. These processes may impact effluent dispersion and, consequently, water quality, sedimentation patterns, and possibly the benthic environment.

Therefore, potential issues regarding direct and indirect construction and operational impacts of a JWPCP tunnel and ocean outfall could include:

- Water quality
- Essential fish habitat (EFH)
- Interference with local bottom currents
- Sedimentation
- Bottom habitat and marine environment
- Commercial and recreational fisheries
- Navigation to/from Port of Los Angeles and Port of Long Beach
- Accidental spills of fuel or hazardous materials
- Palos Verdes Shelf Superfund Site

### Approach

The following data will be reviewed for the analysis:

- Marine monitoring data gathered over the past three decades with respect to the history of effluent quality from the JWPCP
- Receiving water quality data identifying bacteriology, dissolved oxygen, and water clarity parameters
- Data and historical trends regarding kelp coverage, fin erosion, demersal fish and benthic populations, and bioaccumulation
- Effluent dispersion modeling results
- DDT-contaminated sediment data

The construction impact assessment will address the potential effects of construction activities on the marine environment, including the benthic habitat and local fisheries. The analysis will evaluate the potential impacts associated with the differences in location, time required for construction, construction methods, navigation restrictions, transit of equipment and material, and disposition of construction materials and spoils in relation to benthic habitat and fisheries. In addition, impact analysis will address accidental spills of fuel or hazardous materials during construction of an outfall and the measures that would be taken to minimize the potential for spills and quickly react and contain spills should they occur. Changes in habitat type, including the loss or gain of soft-bottom and hard-bottom substrate, will also be evaluated for potential long-term impacts on marine communities.

Operational impacts of a new JWPCP tunnel and ocean outfall will be evaluated, as will the effects of the anticipated discharges from the existing JWPCP and a new JWPCP tunnel and ocean outfall. Sediment deposition from the discharged effluent from a JWPCP tunnel and ocean outfall will be evaluated as part of the operation of the new outfall.

In addition, existing data on benthos, algae, fish, and other wildlife will be reviewed to determine potential operational impacts of the JOS effluent management system on marine species in the San Gabriel River tidal prism. The nutrient, metals, and organics loading and salinity changes in the saltwater prism resulting from operation of JOS facilities will be examined. Operational effects on flow discharged to the San Gabriel River will be determined.

## 5.12 Noise and Vibrations

### Issues

Issues associated with noise and vibrations involve both construction and operational activities of the MFP components. Construction activities that could be a significant source of noise and vibrations include trucking operations, use of heavy construction equipment (e.g., graders, cranes, and front-end loaders), pile driving activities, and blasting.

Sources of operational noise related to transportation include traffic generated by facility workers, operation and maintenance vehicles, and waste transport trucks. Fixed sources of noise may include aeration equipment (i.e., pumps and motors at pump stations), backup emergency generators, fans, paging systems, and alarms.

It is likely that there would be more construction-related issues than operational-related issues associated with the noise and vibrations generated by a JWPCP tunnel and ocean outfall project. Construction-related issues could include construction noise and vibrations at construction shaft sites and access shaft sites. Uses such as truck operations, heavy construction equipment operations, and pile driving activities could cause noise and vibrations. Once a JWPCP tunnel and ocean outfall are built, the tunnel would be below ground surface and the ocean outfall would be on or below the seafloor, thus incapable of generating noise that would impact sensitive receptors.

### Approach

Assessing the significance of potential noise effects associated with implementation of the multiple components of the MFP will require determining the physical and regulatory noise setting. Setting information will be based on:

- Previous noise studies conducted in the area(s)
- Noise elements of existing general plan documents

- Noise ordinances of local jurisdictions
- Location(s) of sensitive receptor(s)
- Field reconnaissance surveys

Construction noise and vibration impacts related to the MFP components will be evaluated using analysis methods recommended by the U.S. Department of Transportation and other agencies, as appropriate. Program-level construction and operational data will be used to complete the MFP components analysis.

Construction noise and vibration impacts related to a new JWPCP tunnel and ocean outfall will also be evaluated using analysis methods recommended by the U.S. Department of Transportation and other agencies, as appropriate. Project-level construction and operational data will be used to complete a JWPCP tunnel and ocean outfall noise analysis.

## 5.13 Population, Employment, and Housing/Environmental Justice

### Issues

Issues associated with population, housing, employment, and environmental justice primarily involve construction of MFP components. Construction of new facilities or alteration of current facilities could lead to displacement or interruption of operation of businesses during construction. Operations of wastewater treatment plants and solids management programs could also affect population and housing. The following issues could be reviewed:

- Population, employment, or housing displacement associated with the components
- Additional population growth or concentration of population in the service area
- Additional residential housing units in the service area
- Additional jobs during construction and long-term operation of new facilities
- Shift in jobs/ housing balance
- Conflicts with adopted plans or goals for growth in the service area
- Disproportionate impacts to minority and disadvantaged populations

Issues associated with population, housing, employment, and environmental justice primarily involve the construction in contrast to operation of a new JWPCP tunnel and ocean outfall. Construction of new facilities or alteration of current facilities could lead to displacement or interruption of operation of businesses during construction. The following issues could be reviewed:

- Additional jobs during construction and long-term operation of new facilities
- Disproportionate impacts to minority and disadvantaged populations
- Temporary disruption to residents and businesses along construction traffic routes and at the shaft sites

### Approach

Should any housing be affected, the appropriate Housing Element goals and policies, as well as local and regional growth projections identified in the general plan and identified by SCAG's Regional Comprehensive Plan (RCP), will be evaluated to determine the impacts on population and housing. The magnitude and potential growth inducement based on the MFP components that could have

implications on population and housing trends will be assessed. The number and types of jobs that could be added or impacted as a result of the proposed project will be estimated.

Direct impacts on the job/housing balance in the JOS service area and each treatment plant drainage area will be analyzed based on:

- The number of construction and operational jobs generated by MFP activities
- Housing demands associated with operational employment
- The location and number of residences and new businesses that could be displaced as a result of construction of additional JOS facilities

Information sources to be used in the analysis include:

- Los Angeles County General Plan and EIR
- Local city and community plans in the Sanitation Districts' service area
- SCAG RCP Growth Management Element, Land Use Element, and EIR
- Subregional Inputs for SCAG/Los Angeles County Planning Subregions, including the city of Los Angeles, Tri-City, southeast Los Angeles County cities, South Bay cities, San Gabriel Valley, and West Side Summit

In accordance with Executive Order 12898 (Federal Actions to address Environmental Justice in Minority and Low Income Populations), potential concentrations of minority and disadvantaged populations will be identified, including whether the MFP impacts could disproportionately affect these groups. This will include an evaluation of the demographic characteristics of the surrounding areas for the MFP components to determine whether the MFP or a JWPCP tunnel and ocean outfall project could result in disproportionate impacts on disadvantaged groups.

## 5.14 Public Services

### Issues

Potential issues related to the construction and operation of the MFP and to the construction of a JWPCP tunnel and ocean outfall could include:

- The undue taxation of public service agencies (fire, police, schools, other emergency personnel) to respond to demands resulting from implementation of the MFP
- The need for additional services required to accommodate adequate fire, police, and other emergency services
- Disruption or impediment of fire, police, or other emergency services to areas/facilities where components of the MFP would be constructed or operated
- Need for additional government services or public facilities (e.g., roads)

### Approach

Information regarding public services will be taken from the following areas:

- Public safety elements from relevant general plans of each local jurisdiction in which construction activities are proposed
- Personal communication with local fire, police, and other emergency departments of each local jurisdiction in which construction activities are proposed

Existing and projected regional supplies and demands for public services will be described along with any existing constraints, deficiencies, or other issues for the MFP components. For a new JWPCP tunnel and ocean outfall, regional and local supplies and demands for public services will be described along with any existing constraints, deficiencies, or other issues for a tunnel and ocean outfall. Existing facilities, service areas, user demands, capacities, planned or proposed expansions, and existing sufficiency issues will be analyzed.

## 5.15 Recreation

### Issues

The MFP components may have the potential to impact the accessibility and use of recreational areas such as parks during construction and operation. This could include:

- Removing a recreational area from service during construction (short-term)
- Removing a recreational area from service during operation (long-term)
- Reducing recreational area accessibility during construction (short-term)
- Reducing recreational area accessibility during operation (long-term)

A new JWPCP tunnel and ocean outfall would require the construction of shaft sites for a tunnel at the JWPCP and other locations, an ocean diffuser, and possibly a seafloor pipeline. The construction of the access shaft sites and an ocean outfall may have the potential to impact the accessibility and use of recreational areas such as parks and various marine locations. In addition to those impacts listed above, construction of a new tunnel and ocean outfall could include:

- Exposing diving, fishing, and recreation boats to construction hazards (short-term)
- Interfering with anchorage and fishing nets (long-term)
- Exposing divers swimming near outfalls to health risks (long-term)

### Approach

Information regarding recreation will be taken from the following areas:

- Los Angeles General Plan Recreational Element
- Relevant community planning area(s) plans (e.g., San Pedro Community Planning Area)
- Correspondence with Los Angeles Department of Recreation and Parks
- SCAG data regarding recreation
- Census data

The recreational area in the general vicinity of the project will be identified, described, and mapped. Impacts will be assessed including, but not limited to, the following:

- Reduction of general park service ratios based on acres and census data
- Reduction of recreational area access
- Length of time the recreational area will be out of service

## 5.16 Transportation and Traffic

### Issues

Issues associated with transportation related to constructing or altering existing MFP components involved both construction-related and operational impacts.

The temporary construction-related issues could include:

- Additional trips occurring during transportation of the construction crew and materials
- Increase in traffic volume on the adjacent roadways resulting from road closures and detours
- Alteration of normal circulation patterns and interruption of traffic flow during construction resulting from road closures and detours
- Increased demand for parking to serve construction workers
- Increase in traffic hazards resulting from construction activities

Operational issues could include:

- Increased demand for parking to serve additional employees
- Safety and operational problems of the access roads used by the trucks transporting biosolids
- Traffic increases due to additional employees, material/supply deliveries, and truck traffic associated with increased biosolids disposal
- Additional use of rail transport

There are no marine transportation issues associated with the program components of the MFP, as none of these components would be constructed or operated in a marine environment.

Issues associated with transportation related to construction of a JWPCP tunnel and ocean outfall could include:

- Temporary increases in auto, truck, or rail trips to transport the construction crew and materials to and from work sites
- Temporary alteration of normal circulation patterns and interruption of traffic flow during construction that could result from any required road closures and/or detours, possibly including temporary increases in volume on nearby streets
- Increases in traffic, and bicycle and pedestrian hazards resulting from construction activities
- Disruption in marine transportation adversely affecting existing ship traffic to and from the Ports of Los Angeles and Long Beach
- Location of shaft site may consume space that might otherwise be used for port container operations
- Interference with shipping anchorage near outfall
- Navigational hazards to marine traffic

Issues associated with transportation related to the operation of a JWPCP tunnel and ocean outfall could include:

- Location of shaft site may consume space that might otherwise be used for port container operations
- Interference with shipping anchorage near outfall

## Approach

A general regional setting of the MFP components area will be developed using the following sources of information:

- Caltrans' 2005 Traffic Volumes on California State Highways
- Information on relevant current projects being planned by Caltrans District 7
- Destination 2030 (regional transportation plan prepared by SCAG)
- Metro Long-Range Transportation Plan
- Route maps and information on planned service changes for public transit providers

Analysis of improvements in the existing conveyance system and water reclamation/treatment plants and other program elements will be on a programmatic level. The types of impacts that could occur with each program element will be identified, and their significance will be assessed.

The approach to analyzing the construction and operational terrestrial, or land-based, transportation issues of a new JWPCP tunnel and ocean outfall could involve:

- Conducting focused traffic impact studies using traffic count data in the vicinity of the JWPCP and any other construction location(s). The scope of these studies will be discussed with the relevant local jurisdictions and will include an evaluation of temporary short-term impacts associated with outfall and tunnel construction (construction workers and truck traffic) and an assessment of long-term impacts that may result from project-related increases in employment and biosolids generation at the JWPCP
- Reviewing regional traffic growth forecasts and information on locally planned development projects and street improvements to estimate cumulative background conditions at the time when construction activities are planned
- Estimating incremental trip generation associated with construction and operation of the project and assigning that traffic to the surrounding streets and highways on the basis of the project description information
- Estimating and assessing the significance of the increased demand for construction worker parking at each construction site and, potentially, the reduced supply during the construction period
- Evaluation of the potential temporary hazards to traffic, cyclists, and pedestrians in the vicinity of construction sites
- Development of appropriate mitigation measures

The approach to analyzing construction and operational marine transportation issues of a new JWPCP tunnel and ocean outfall construction and operational marine transportation issues could involve:

- Estimating increases in vessel traffic based on information from the design engineering team on possible construction and operation alternatives
- Assessing impacts on marine transportation from the proposed project based on a determination of whether the proposed JWPCP tunnel and ocean outfall would unduly tax the ability of U.S. Coast Guard and the Marine Exchange. The draft Los Angeles CEQA threshold guidelines will be used with respect to vessel traffic, which states that marine transportation impacts would normally be considered to have a significant impact if the potential disruption to existing ship traffic or vessel safety would be substantial

## 5.17 Utilities, Service Systems, and Energy

### Issues

Potential issues related to the construction and operation of the MFP components and the construction and operation of a new JWPCP tunnel and ocean outfall could include:

- The undue taxation of service agencies to respond to MFP demands
- The need for additional services required to accommodate adequate service for the MFP
- The disruption or impediment of service to areas where the MFP would be constructed or operated
- Energy generation from the combustion of digester gas at the JWPCP will increase as a result of the digestion and stabilization of additional biosolids

### Approach

Information regarding utilities/service systems/energy will be taken from the following areas:

- California Energy Commission
- Southern California Edison
- Los Angeles Department of Water and Power
- Metropolitan Water District of Southern California
- The Southern California Gas Company
- Sanitation Districts of Los Angeles County
- Local resources
- Personal communications

Existing and projected regional supplies, demands, and facilities will be described along with any existing constraints, deficiencies, or service issues for the MFP. Existing demands from each of these components will be described in terms of water supply, wastewater generation, energy and natural gas consumption, solid waste generation, and public service demands.

For a new JWPCP tunnel and ocean outfall, existing and future water, energy, and other public utilities within the vicinity of the proposed ocean outfall and tunnel construction that have the potential to be affected by the project will be described. Existing facilities, service areas, user demands, capacities, and planned or proposed expansions and existing sufficiency issues will be analyzed.

## 5.18 Cumulative and Growth-Inducing Impacts

### Issues

Potential issues regarding the program components of the MFP as well as a new JWPCP tunnel and ocean outfall project include significant growth-inducing impacts to which implementation of the recommended MFP might contribute. Issues could include:

- The potential capacity addition to MFP components and their potential influence on growth
- The specific relationship between the Sanitation Districts' treatment and conveyance capacity to projected and planned growth

- The consistency of the MFP with projected growth
- The development policies of the county's and cities' general plans and whether the implementation of the MFP would eliminate a significant obstacle to growth in an area that would otherwise not be affected

## Approach

A cumulative impact consists of significant effects that are the result of the combined effects of individual past, present, and probable future projects. A project's individual effect may be less than significant while still making a contribution to a significant cumulative effect. A cumulative impact analysis will be developed by the Sanitation Districts and will include build-out of the general plans for the cities and the county areas within the MFP area.

In addition, secondary growth-related impacts associated with the implementation of the MFP will be evaluated pursuant to the CEQA guidelines for growth inducement. The role that utilities, in general, and the Sanitation Districts, in particular, play in accommodating regional development will be objectively described. Other factors (e.g., economic growth and employment) influencing growth will also be described.

## Attachment 2
# NOTICE OF INTENT

BILLING CODE: 3710-KF-P

DEPARTMENT OF DEFENSE

Intent to prepare a Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) for a permit application for the Sanitation Districts of Los Angeles County's (Sanitation Districts) Clearwater Program in Los Angeles County, California.

AGENCY: U.S. Army Corps of Engineers, DoD.

ACTION: Notice of Intent (NOI).

SUMMARY: In compliance with the National Environmental Policy Act (NEPA) of 1969,40 CFR 1508.22, and 33 CFR Parts 230 and 325, and in conjunction with the Sanitation Districts, the U.S. Army Corps of Engineers (Corps) is announcing its intent to prepare a DEIS/EIR for the Clearwater Program. The Clearwater Program is a strategic planning initiative to identify wastewater conveyance, wastewater treatment, effluent management, solids processing, and biosolids management needs for the Sanitation Districts' Joint Outfall System through the year 2050. The Clearwater Program will entail the preparation of a new Master Facilities Plan (MFP), which will guide the management, and upgrade/development of the Sanitation Districts' infrastructure. A major component of the MFP is the construction of a new ocean outfall structure extending from the coastline in the vicinity of White Point, Point Fermin, or the Port of Los Angeles up to approximately 7 miles seaward of San Pedro Bay in the Pacific Ocean. The construction of the structure would entail discharge of dredged and fill material in waters of the United States, work in navigable waters of the United States, and potentially the transport of dredged material for ocean disposal. Accordingly, the Sanitation Districts intend to submit a Department of Army application pursuant to Section 404 of the Clean Water Act (CWA), Section 10 of the Rivers an Harbors Act (RHA), and if necessary Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA).

FOR ADDITIONAL INFORMATION CONTACT: Kenneth Wong, Project Manager, at (213) 452-3290 (kenneth.wong@usace.army.mil), U.S. Army Corps of Engineers, Los Angeles District, P.O. Box 532711, Los Angeles, CA 90053-2325

SUPPLEMENTAL INFORMATION:

**1. Project Purpose and Need:** The Sanitation Districts currently utilize two tunnels and four ocean outfall structures to convey effluent from their Joint Water Pollution Control Plant (JWPCP) in the city of Carson to the Pacific Ocean. The two tunnels were constructed in 1937 and 1958 and have not been inspected in nearly 50 years. Inspection of the tunnels is not possible due to their overall length, limited access, lack of separation between the tunnels, and the overall flow through the tunnels. The project need is to inspect and upgrade aging infrastructure, and to accommodate the projected increase in wastewater flows. The project purpose is to improve existing infrastructure and increase wastewater treatment capacity to accommodate estimated 2050 flows, while complying with all applicable water quality standards. As a part of planned infrastructure improvements, the Sanitation Districts propose to construct a new tunnel and ocean outfall structure.

The new ocean outfall would be composed of onshore and offshore components. The onshore component would entail construction of a 4- to 7-mile long underground tunnel approximately up to 200 feet below ground from the JWPCP to one of three areas (White Point, Point Fermin, or the Port of Los Angeles) from where the tunnel will make the onshore-to-offshore transition. Once offshore, the tunnel may extend up to 7 miles seaward and connect to a diffuser via a riser. Alternatively, once offshore, the tunnel may transition to the ocean floor via a riser to seafloor pipeline(s), which would connect to the diffuser structure. Depending on the location of the diffuser, the seafloor pipeline(s) may extend up to 7 miles offshore.

**2. Proposed Action:** The offshore component of the new ocean outfall could entail excavation of an approximately 105-foot-wide trench up to 7 miles long requiring

dredging of approximately 950,000 cubic yards of sediment. Once excavated, outfall pipe(s), diffuser pipes, bedding, ballast, dredged material, and armor stone would be discharged into the trench. Dredged material not used for trench backfill could be designated for ocean disposal or beach nourishment depending on sediment chemistry.

Dredging, pipe laying, trenching, and other construction activities within the Pacific Ocean, a navigable water of the United States, would be subject to Section 10 of the Rivers and Harbors Act. The discharge of dredged and fill materials associated with pipe laying activities in the Pacific Ocean, a water of the United States, would also be subject to Section 404 of the Clean Water Act. The transportation and discharge of dredged material for the purpose of ocean disposal, if required, would be subject to Section 103 of the Marine Protection, Research, and Sanctuaries Act.

The geographic jurisdiction of Section 10 RHA and Section 404 CWA extends 3 geographic miles seaward (33 CFR Part 329.12 (a)). However, a wider zone of geographic jurisdiction out to the Outer Continental Shelf (200 miles seaward) is recognized when a project entails placement of devices on the seabed (33 CFR 322.3 (b)). Because the project entails placement of a pipeline up to 7 miles on the seabed, the entire length of the project is subject to both Section 10 RHA and Section 404 CWA jurisdictions.

**3. Alternatives Considered:** The feasibility of several alternatives is being considered and will be addressed in the DEIS/EIR. Those considered feasible will be analyzed in equal detail to the Proposed Action. Alternatives for the proposed project would evaluate alternate onshore and offshore tunnel alignments; alternate tunnel shaft site locations; and alternate diffuser locations. Furthermore, alternate offshore project designs would be evaluated. One design would extend the tunnel up to 7 miles offshore and connect to the diffuser via a riser. Alternatively, the tunnel may transition via a riser to seafloor pipeline(s), which would connect to a diffuser. Depending on the location of the diffuser, the seafloor pipeline(s) may extend up to 7 miles offshore. The No Federal Action Baseline Alternative would result in implementation of the recommended projects within

the MFP without the new ocean outfall and other infrastructure upgrades that require Department of Army permits. Under the No Action Alternative, there would be no upgrade and development of the Sanitation Districts' infrastructure, including the new ocean outfall, to accommodate wastewater management needs through 2050. These alternatives will be further formulated and developed during the scoping process. Additional alternatives that may be developed during the scoping process will also be considered in the DEIS/EIR.

**5. Scoping Process:** The Corps' scoping process for the DEIS/EIR will involve soliciting written comments and a public meeting. Potential significant issues to be addressed in the DEIS/EIR include aesthetics; air quality; biological resources; cultural resources; geology; hydrology; hazards and hazardous materials; water quality; public health; land use and planning; marine environment (marine hydrology, water quality, public health, and biological resources); noise; population, employment, and housing/environmental justice; public services; recreation; transportation and traffic; utilities, service systems, and energy; and cumulative and growth-inducing impacts. Additional environmental impacts may be identified during the scoping process. Furthermore, the DEIS/EIR will assess the consistency of the Proposed Action with the Coastal Zone Management Act and potential water quality impacts pursuant to Section 401 of the Clean Water Act. Comments are invited from the public and affected agencies, including, but not limited to, the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Coast Guard, California Department of Fish and Game, California State Water Resources Control Board, California State Lands Commission, California Coastal Commission, and the city of Los Angeles.

PUBLIC MEETING: A public scoping meeting to receive input on the scope of the DEIS/EIR will be conducted on Thursday, November 6, 2008 at 6:30 p.m. at Crowne Plaza Hotel, 601 South Palos Verdes Street, San Pedro, California. If you have any questions regarding the meeting, please contact Steven Highter, Supervising Engineer, Sanitation Districts, at shighter@lacsd.org.

**6. Availability of the Draft EIS:** The DEIS/EIR is expected to be published and circulated in fall 2009, and a public meeting will be held after its publication.

**Attachment 3**

# WRITTEN COMMENTS ON THE NOP/NOI

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION IX**
**75 Hawthorne Street**
**San Francisco, CA 94105-3901**

November 4, 2008

Mr. Kenneth Wong
Project Manager
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, CA 90053

Subject: Scoping Comments for the October 6, 2008 Federal Register Notice of Intent (NOI) to Prepare a Draft Environmental Impact Statement (DEIS) for the County Sanitation Districts of Los Angeles County Clearwater Program Master Facilities Plan, Los Angeles County, California

Dear Mr. Wong:

The US Environmental Protection Agency (EPA) has reviewed the County Sanitation Districts of Los Angeles County (District) NOI to prepare a Draft Environmental Impact Statement (DEIS) for the Clearwater Program Master Facilities Plan (MFP) and the Joint Water Pollution Control Plant (JWPCP) ocean outfall for Los Angeles County, California. We previously provided detailed comments on the January 2, 2008 Draft NOI in our letter dated March 5, 2008. Based on our review of the NOI, our Draft NOI comments still apply to the development of the DEIS for the MFP and JWPCP. EPA's attached letter to the District dated July 30, 2008, clarifying Super Fund Program comments, also applies.

We look forward to coordinating with the Corps and the District during the development of the DEIS. When complete, please send two hard copies and one CD copy of the DEIS to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please call me at (415) 972-3847.

Sincerely,

Paul F. Amato
Environmental Protection Specialist
Environmental Review Office

*Printed on Recycled Paper*

Enclosed:
EPA's July 30, 2008 letter

Cc:
David Castanon, Chief, Regulatory Branch, Los Angeles District, Corps of Engineers
Thomas J. LeBrun, Department Head, County Sanitation Districts of Los Angeles County
Steven Highter, Supervising Engineer, County Sanitation Districts of Los Angeles County
Joseph Gully, County Sanitation Districts of Los Angeles County

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 30, 2008

Thomas J. LeBrun, Department Head
Facilities Planning Department
County Sanitation Districts of Los Angeles
1955 Workman Mill Road
Whittier, CA 90607

Re: Draft Notice of Intent to prepare a
Draft Environmental Impact Statement for the
LACSD Clearwater Program, Master Facilities Plan
Los Angeles County, CA

Dear Mr. LeBrun:

This letter provides clarification requested by LACSD regarding the Superfund Program's comments in EPA's March 5th letter on the above-referenced project. EPA's letter pointed out that a Superfund site is located on the Palos Verdes Shelf and requested that EPA be given the opportunity to review any plans to build an outfall on the Shelf to assure that the layer of contaminated sediment (i.e., the "effluent-affected" sediment) on the Shelf is not disturbed.

As you know, the effluent-affected (EA) sediment deposit on Palos Verdes Shelf extends from the existing outfalls to the north past Pt. Vicente. Outfall construction in that area would be problematic with a high probability of causing a release of contaminants into the environment. However, sediment and oceanographic data collected by the U.S. Geological Survey, EPA, and your own Ocean Monitoring and Research Group suggest that the area south of the existing outfalls, i.e., south of LACSD's 9 transect, has returned substantially to its native state and contains little to no effluent-affected sediment.

Our analysis of existing oceanographic data indicates an outfall south of the 9 transect would be unlikely to disturb the EA deposit. If LACSD decides a Palos Verdes Shelf location warrants further consideration, EPA would request additional information about the location and construction. We would be interested in a full characterization (chemical as well as geotechnical data) of the surface and subsurface sediment in the area under consideration and would like additional information on the outfall design, e.g., location of trenching, estimated volume of cuttings, disposal plan, resuspension management plan, etc.

We realize LACSD is in the preliminary phase of outfall location selection. If the decision is made to seriously consider a Palos Verdes Shelf location, EPA would be available to meet with you and your staff to provide more detailed information on the kinds of studies requested and discuss how we could be involved in reviews of resulting data and design plans.

It is also worth noting that LACSD is a signatory to the Amended Consent Decree in the United States v. Montrose Chemical Corporation of California case. EPA suggests that LACSD consult with its legal counsel concerning any legal issues that could arise from construction activities within the boundaries of the Palos Verdes Shelf Superfund site.

Please feel free to contact me at (415) 972-3010 if you would like further clarification or additional discussion.

Sincerely,

Carmen White

Carmen White, EPA
Remedial Project Manager

cc: Roberta Blank, EPA-SFD
Taly Jolish, EPA-ORC
Brian Ross, EPA-WTR
David Smith, EPA-WTR
Paul Amato, EPA-CED
Steven John, EPA LA Field Office
Joseph Gully, LACSD
David Castanon, USACE, LA District

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION IX**
**75 Hawthorne Street**
**San Francisco, CA 94105-3901**

March 5, 2008

Thomas J. LeBrun, Department Head
Facilities Planning Department
County Sanitation Districts of Los Angeles
1955 Workman Mill Road
Whittier, CA 90607

Subject: Scoping Comments for the Draft Notice of Intent (NOI) to Prepare a Draft Environmental Impact Statement (DEIS) for the Los Angeles County Sanitation District Clearwater Program Master Facilities Plan, Los Angeles County, California

Dear Mr. LeBrun:

The US Environmental Protection Agency (EPA) has reviewed the Los Angeles County Sanitation District (District) Draft NOI to prepare a Draft Environmental Impact Statement (DEIS) for the Clearwater Program Master Facilities Plan (MFP) and the Joint Water Pollution Control Plant (JWPCP) ocean outfall for Los Angeles County, California. Our review is pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. These comments were also prepared under the authority of, and in accordance with the provisions of the Federal Guidelines promulgated at 40 CFR 230 under Section 404(b)(1) of the Clean Water Act.

EPA supports using a flexible approach for the development of alternatives for the MFP and JWPCP outfall that consider the unique environmental conditions in the project area. We strongly encourage the District consider alternatives that avoid impacts to the Palos Verdes DDT Superfund Site and the LA-2 Ocean Disposal Site for dredging material. Proposed alternatives should be assessed for potential impacts to the already degraded South Coast Air Basin and for conformity with local air quality plans. Water quality should be assessed for cumulative impacts from increased contributions of emerging contaminants to surface and groundwater. Because the DEIS is intended to provide the cumulative impacts analysis for the JWPCP outfall and for future projects under the MFP, the analysis must be rigorous and comprehensive.

We appreciate having had the opportunity to meet with you and your staff on December 10, 2007, to begin early coordination between the District and EPA. To assist in the scoping process, we have identified issues for your attention in the preparation of the DEIS. These

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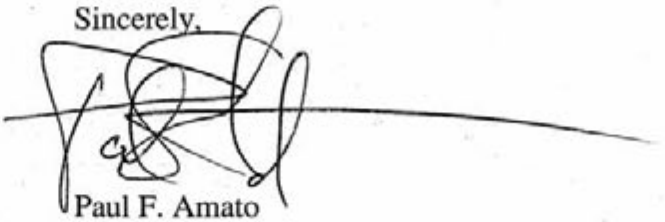
detailed comments are enclosed. We look forward to continued coordination with the District and other relevant agencies to develop project alternatives and protect environmental resources prior to the release of the DEIS. Please send two hard copies and one CD copy of the DEIS to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please call me at (415) 972-3847.

Sincerely,



Paul F. Amato
Environmental Protection Specialist
Environmental Review Office
Communities and Ecosystems Division

Enclosed: Detailed EPA Scoping Comments

Cc: David Castanon, Chief, Regulatory Branch,
Los Angeles District, Corps of Engineers

DETAILED EPA SCOPING COMMENTS ON THE DRAFT NOI FOR THE CLEARWATER PROGRAM MASTER FACILITIES PLAN, LOS ANGELES COUNTY, CA, MARCH 5, 2008.

## Purpose and Need

The US Environmental Protection Agency (EPA) understands that the federal lead agency (FLA) has not been identified for the proposed project. Following FLA determination, please be sure that the DEIS includes the purpose and need statement of the federal action in addition to the already identified purpose and need of the Clearwater Program. In addition, the District should consider whether expanding the existing biosolids program should be included as part of the purpose and need statement.

## Thresholds of Significance

The DEIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not. Thresholds of significance should be determined by considering the context and intensity of an action and its effects (40 CFR 1508.27).

## Alternatives Analysis

The DEIS should clearly describe the five individual components of the Master Facilities Plan (MFP) and the project level Joint Water Pollution Control Plant (JWPCP) ocean outfall, and evaluate a reasonable range of possible alternatives that satisfy the project purpose and need. EPA urges a creative and flexible approach be taken in the development of potential alternatives. Note that the National Environmental Policy Act (NEPA) requires evaluation of reasonable alternatives, including those that may not be within the jurisdiction of the lead agency (40 CFR Section 1502.14(c)). Alternatives analysis should assess the direct, indirect and cumulative impacts of each alternative in a comparative form. Furthermore, there should be a clear discussion of the reasons for the elimination of alternatives which were not evaluated in detail. The DEIS should describe how each alternative was developed, how it addresses the purpose and need, and how it will be implemented.

Both MFP and JWPCP outfall alternatives and potential impacts should be described relative to appropriate baseline conditions. Specific conditions to consider for the JWPCP outfall include the Palos Verdes Shelf DDT Superfund Site, the LA-2 Ocean Disposal Site for dredging materials, Essential Fisheries Habitat, commercial and recreational fisheries, air quality non-attainment in the South Coast Air Basin (SCAB), and ocean and beach recreational opportunities. Given the nature of the proposed project, we encourage the development of alternatives that avoid impacts to aquatic and terrestrial biological resources, hydrology and water quality, air quality, and the environmental justice community living in and near the project area. Lastly, EPA encourages the development or expansion of alternatives that maximize technologies to improve energy efficiency such as the existing cogeneration JWPCP Power Generation Facility.

EPA anticipates the DEIS will include more detailed descriptions of the JWPCP outfall alternatives than the MFP alternative components since it is a project-level NEPA analysis for the outfall and programmatic for the MFP. We also anticipate that future projects resulting from the MFP will be reviewed separately under NEPA as appropriate. The NOI mentions a process for alternatives selection for the DEIS alternatives that would first screen options for the five MFP components then combine them with alternatives for the JWPCP outfall. EPA encourages ongoing coordination with our agency and other appropriate federal, state, and local stakeholders during this process.

**Impacts Analysis**

In general, EPA finds the scope of the NOI program-level (MFP) and project-level (LWPCP outfall) impacts analysis, as well as the approach to assessing these impacts, to be reasonable, clear and comprehensive. Our recommendations for individual resource categories are provided in order to clarify what the DEIS scope should include in addition to what is already listed in the Draft NOI.

**Air Quality**

The DEIS should describe any applicable local, state, or federal requirements and ensure that the emissions from both the construction and the operational phases of the project conform to the approved State Implementation Plan and do not cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS). The DEIS should also include a detailed discussion of ambient air conditions (i.e., baseline or existing conditions), the area's attainment or nonattainment status for all NAAQS, and potential air quality impacts of the project (including cumulative and indirect impacts) for each fully evaluated alternative.

For areas that are nonattainment for $PM_{10}$ and $PM_{2.5}$ (particulate matter smaller that 10 or 2.5 microns respectively), the responsible agency should include a Construction Emissions Mitigation Plan in the DEIS and adopt this plan in the Record of Decision (ROD). In addition to all applicable local, state, or federal requirements, EPA recommends that the following mitigation measures be included in the Construction Emissions Mitigation Plan in order to reduce impacts associated with emissions of particulate matter and other toxics from construction-related activities:

*Fugitive Dust Source Controls:*

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

*Mobile and Stationary Source Controls:*

- Reduce use, trips, and unnecessary idling from heavy equipment.
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. Engine certification data can be found at the EPA Engine Certification Data web page: http://www.epa.gov/OMS/certdata.htm.
- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations
- If practicable, lease new, clean equipment meeting the most stringent of applicable Federal or State Standards. In general, only Tier 2 or newer engines should be employed in the construction phase.
- Utilize EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site.

*Administrative controls:*

- Identify all commitments to reduce construction emissions and update the air quality analysis to reflect additional air quality improvements that would result from adopting specific air quality measures.
- Identify where implementation of mitigation measures is rejected based on economic infeasibility.
- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking. (Suitability of control devices is based on: whether there is reduced normal availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.) Utilize cleanest available fuel engines in construction equipment and identify opportunities for electrification. Use ultra low sulfur fuel (diesel with 15 parts per million or less) in engines where alternative fuels such as biodiesel and natural gas are not possible.
- Develop a construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.
- Identify sensitive receptors in the project area, such as children, elderly, and infirm, and specify the means by which you will minimize impacts to these populations. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

The DEIS should discuss potential impacts to air quality due to odor from operation of modified and/or expanded MFP facilities, including biosolids facilities. EPA has developed guidelines for control of odors at biosolids facilities titled Biosolids and Residuals Management Fact Sheet, found at http://www.epa.gov/OW-OWM.html/mtb/odor_control-biosolids.pdf.

**Biological Resources**

The DEIS should clearly describe the methods used for determining the presence or absence of sensitive species and their habitats in both terrestrial and aquatic environments. Potential direct, indirect, and cumulative impacts of the MFP and JWPCP outfall should be determined based on accurate and up to date population and distribution data from recognized sources and if appropriate, from field surveys to groundtruth these sources. This is especially important for construction projects where population and distribution data can help develop alternatives that avoid impacts to protected species and their habitats.

**Hazards and Hazardous Materials**

In addition to the potential sources of hazardous materials listed in the Draft NOI, the DEIS should also assess potential impacts from hazardous substances related to construction such as fuels and lubricants. A spill prevention, response and cleanup plan, including best management practices (BMPs) to prevent contamination should be described in the DEIS and can be provided as an appendix.

**Hydrology and Water Quality**

EPA supports including in the DEIS an analysis of the potential cumulative effects of the MFP on concentrations of emerging contaminants to surface and groundwater and to sensitive receptors in the environment. Based on activities mentioned in the Draft NOI, EPA believes there are at least three emerging contaminant pathways to surface and groundwater: use of recycled water, discharge into surface waters like the San Gabriel River, and use of biosolids for agricultural or other purposes. EPA supports the appropriate use of recycled water and biosolids but also recognizes the potential impacts from introducing emerging contaminants into the environment. EPA suggests the District refer to *A Guide to the Biosolids Risk Assessment for the EPA Part 503 Rule* found at http://www.epa.gov/owm/mtb/biosolids/503rule/index.htm and to EPA's *Guidelines for Water Reuse*, found at http://www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.htm. In addition, the DEIS should include a discussion of MFP consistency with EPA Standards for the Use or Disposal of Sewage Sludge and EPA's Review of Existing Sewage Sludge Regulations found at http://www.epa.gov/EPA-WATER/2003/December/Day-31/w32217.htm.

Impacts to both surface and groundwater quality could result from exposure to construction related pollutants, including sediments. EPA suggests the DEIS include a discussion of potential impacts to surface and groundwater quality due to construction related pollutants. In addition to the hydrology and water quality issues identified in the Draft NOI, the District should discuss the potential cumulative impacts due to increased emerging contaminants to surface and groundwater.

**Cumulative Impacts**

The DEIS is intended to serve as the cumulative effects analysis for all future projects under the MFP. As a result, it is critical that the effects analysis be comprehensive and rigorous, and that it consider an appropriate scope of activities, and spatial and temporal scales when assessing project effects. EPA suggests referring to the Council on Environmental Quality 1997, guidance *Considering Cumulative Effects Under the National Environmental Policy Act* found at http://www.nepa.gov/nepa/ccenepa/ccenepa.htm, and 1999 EPA guidance, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* found at http://www.epa.gov/compliance/resources/policies/nepa/cumulative.pdf. In addition, we recommend referring to the EPA, California Department of Transportation, and Federal Highway Administration Guidance for Preparers of Cumulative Impact Analysis found at http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm. While this guidance was developed for transportation projects, the principles and the 8-step process in this guidance can be applied to other types of projects, both within and outside of California. We recommend the principles and steps in this guidance to other agencies as a systematic way to analyze cumulative impacts for their projects.

**Mitigation Monitoring and Reporting**

The DEIS should include a description of appropriate mitigation, monitoring and reporting elements for unavoidable impacts to environmental resources. For the MFP, the DEIS should identify potential mitigation measures that would be further analyzed in future project-specific NEPA documents. For the JWPCP, the DEIS should provide a detailed description of mitigation measures, how these measures will offset negative environmental effects, and a monitoring and reporting program with monitoring methods and timelines.

**December 10, 2007, Early Coordination Meeting**

As discussed at our early coordination meeting at EPA on December 10, 2007, the District should avoid alternatives that would locate the JWPCP outfall or diffuser close to the LA-2 Disposal Site for dredging material. The DEIS should evaluate the potential direct, indirect and cumulative impacts of construction and location of the JWPCP outfall and diffuser on water quality, sediment transport, aquatic species and habitats, currents, and shipping.

EPA also advised the District that dredged material for the JWPCP outfall may be approved for disposal at the LA-2 Disposal Site following the issuance of a Marine Protection, Research and Sanctuaries Act permit for transport of dredged material and a Clean Water Act Section 404 permit for ocean disposal from the US Army Corps of Engineers (Corps) and EPA. Only material dredged from the ocean floor will be considered for ocean disposal following a determination that the material meets EPA's screening criteria and that no beneficial use projects are available to receive clean sediments. The DEIS should include a discussion of applicable

regulations for dredging and disposal, describe screening methods to evaluate dredged sediments, and evaluate all feasible alternatives for reuse and disposal.

Concerns were raised over locating the JWPCP outfall and diffuser in the DDT Superfund Site. EPA advised the District that disturbances from effluent discharge, construction, and potential changes in currents cannot cause a release of DDT or raise DDT levels. EPA offered to assist with the development of a monitoring and modeling program for the project to help determine and monitor project impacts to the DDT Superfund Site. The DEIS should discuss potential environmental effects due to disturbance of DDT contaminated sediments that could result from effluent discharge, construction, and changes in currents as a result of the JWPCP outfall. A discussion of modeling and monitoring results used to determine environmental effects should be included.

The District should continue to coordinate with EPA to determine what criteria must be met prior to disposal of sediments at LA-2 and what potential impacts could occur from locating the JWPCP outfall in the DDT Superfund Site. Please contact Brian Ross at (415) 972-3475 and Allan Ota at (415) 972-3476 regarding dredging and ocean disposal, and Carmen White, (415) 972-3010, regarding the DDT Superfund Site. The DEIS should reflect and describe results of this coordination.

31-150.17.10

**U.S. Department of Homeland Security**
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

November 5, 2008

Steven W. Highter. P. E.
Supervising Engineer Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California 90601

Dear Mr. Highter:

This is in response to your request for comments on the Notice of Preparation of an Environmental Impact Report for the Clearwater Program Master Facilities Plan, Los Angeles County, California.

Please review the current effective Flood Insurance Rate Maps (FIRMs) for the County of Los Angeles (Community Number 065043), Map revised September 26, 2008. Please note that the County of Los Angeles, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

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- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

**Please Note:**

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The Los Angeles County floodplain manager can be reached by calling George De La O, Senior Civil Engineer, at (626) 458-7155.

If you have any questions or concerns, please do not hesitate to call Cynthia McKenzie of the Mitigation staff at (510) 627-7190.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
George De La O, Senior Civil Engineer, Los Angeles County
Garret Tam Sing/Salomon Miranda, State of California, Department of Water Resources, Southern District
Cynthia McKenzie, Senior Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

COUNTY OF LOS ANGELES

DEPARTMENT OF PARKS AND RECREATION

*"Creating Community Through People, Parks and Programs"*

Russ Guiney, Director

November 13, 2008

Sent via Email: SHighter@lacsd.org

Steven W. Highter, P.E.
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California 90601

Dear Mr. Highter:

**NOTICE OF PREPARATION (NOP) OF AN ENVIRONMENTAL IMPACT REPORT (EIR) –CLEARWATER PROGRAM MASTER FACILITIES PLAN**

The Department of Parks and Recreation has reviewed the NOP of an EIR for the Clearwater Program Master Facilities Plan Project. A potential Shaft Site #8 is sited within the Deane Dana Friendship Park (1805 W. 9th Street, San Pedro 90732). Please provide more detailed information and assessment on how the development of the Shaft Site # 8 will impact Deane Dana Friendship Park.

Thank you for including this Department in the review of this notice. If we may be of further assistance, please contact me at (213) 351-5129 or jchien@parks.lacounty.gov

Sincerely,

Jui Ing Chien
Park Planner

c: Parks and Recreation (James Barber, Joan Rupert, Frank Moreno, Norma E. Garcia)

# CITY OF LOS ANGELES
CALIFORNIA

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1149 SOUTH BROADWAY, 8TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-2210
FAX: (213) 485-2979


November 14, 2008

Los Angeles County Sanitation District
Steven W. Highter, P.E.
Supervising Engineer, Planning Section
1955 Workman Mill Road
Whittier, CA 90601

**RE: NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT**

Dear Mr. Highter,

This is in response to your Notice of Preparation of an Environmental Impact Report letter dated October 10, 2008 for the Clearwater Program Master Facilities Plan project.

The City of Los Angeles serves more than 4 million people and conveys its wastewater through more than 6500 miles of sewer lines. The raw wastewater is treated at four wastewater treatment facilities, one of which is located in the Terminal Island area of the City of Los Angeles. The Terminal Island Water Reclamation Plant (TIWRP), with an average flow of roughly 20 MGD receives and treats wastewater generated in the Harbor area of the City.

Currently TIWRP produces 5 MGD of recycled water using micro-filtration and reverse osmosis. The City is studying the possibility of increasing recycled water production to 12.5 MGD and is also developing a Recycled Water Master Plan. This plan will identify large industrial and irrigation customers in the Harbor area and maximize the use of recycled water generated at TIWRP.

In addition to evaluating this concept, the City is interested in the possibility of ocean discharge via LACSD's new outfall. In its NOP report, LACSD has identified several potential alignments (figure 4). One in particular runs close to TIWRP. The City is suggesting that for EIR purposes the potential of adding 20MGD of TIWRP's effluent to the outfall be considered for this report. This possibility has been discussed with the LACSD staff in the past.

I would like to take this opportunity and thank you for providing the City with the opportunity to be involved in this very important process. We would also be interested in commenting on the draft EIR once completed.

If there are any questions, please contact Ali Poosti at (323) 342-6228 for further information.

Sincerely,

ENRIQUE C. ZALDIVAR, Director
Bureau of Sanitation

ECZ:TJM:AP:cr

c: Traci Minamide, BOS/EXEC
Ali Poosti, BOS/WESD

H:ECZ279.CR

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, *Governor*

**CALIFORNIA STATE LANDS COMMISSION**
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

**PAUL D. THAYER,** *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
*Relay Service From TDD Phone* **1-800-735-2929**
*from Voice Phone* **1-800-735-2922**

***Contact Phone:*** **(916) 574-1814**
***Contact FAX:*** **(916) 574-1885**

November 21, 2008

SCH#2008101074

Steven W. Highter
Los Angeles County
Sanitation Districts
1955 Workman Mill Road
Whittier, CA 90601

**Subject: Notice of Preparation for Clearwater Program Master Facilities Plan Environmental Impact Report (EIR)**

Dear Mr. Highter:

Staff of the California State Lands Commission (CSLC) has received the above referenced Notice of Preparation for Los Angeles County Sanitation Districts Clearwater Program Master Facilities Plan EIR. Under the California Environmental Quality Act (CEQA), the CSLC is a Responsible and/or Trustee Agency for any and all projects which could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters.

The State acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all the people of the State for statewide Public Trust purposes which include waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. The landward boundaries of the State's sovereign interests in areas that are subject to tidal action are generally based upon the ordinary high water marks of these waterways as they last naturally existed. Both the easement and fee-owned lands are under the jurisdiction of the State Lands Commission. The CSLC has certain residual and review authority over Public Trust Resources on tide and submerged lands legislatively granted in trust to local jurisdictions.

DOC #
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Staff of the CSLC has not determined whether the project, or any potential alternatives, are located on sovereign versus granted lands. If the project or alternatives involve sovereign lands and result in changes, repairs, replacement or relocation of wastewater discharge pipelines (JWPCP Effluent Management Component) on such lands, a lease will need to be obtained from the CSLC.

Sincerely,

Gail Newton, Chief
Division of Environmental Planning
and Management

cc:

Tom Luster
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Barbara Dugal, CSLC

-----Original Message-----
From: Jane Smith [mailto:SMITHJ@slc.ca.gov]
Sent: Friday, December 05, 2008 4:04 PM
To: Highter, Steve
Cc: Judy Brown; Grace Kato; Jennifer Lucchesi
Subject: Clearwater Program Master Facilities Plan

Steve, per our phone conversation of yesterday, I was asked to review the Notice of Prep of an Environmental Impact Report for the Clearwater Program Master Facilities Plan. Comments on the NOP were due November 21. You indicated that an email concerning the SLC's jurisdiction would suffice.

As I understand it, a major component of the Plan will be the possible construction of a new tunnel and ocean outfall to convey treated wastewater from the Sanitation District's Joint Water Pollution Control Plant in Carson to the Pacific Ocean, where it would be discharged 2-7 miles offshore at a depth of approximately 190 feet.

Based on Figure 3 of the NOP, the new outfall alignment may extend onto state-owned sovereign lands that have been legislatively granted to the City of Los Angeles. If that is the case, the SLC would have no leasing jurisdiction. If, however, the outfall falls outside of the legislative grant, a lease from the SLC is required.

We will need a more detailed map in order to determine the extent of the state's sovereign interest and whether a lease will be required.

It was a pleasure talking with you. Feel free to contact me as necessary. Thanks.

jane

# COUNTY OF LOS ANGELES

## DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

GAIL FARBER, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460


IN REPLY PLEASE
REFER TO FILE: LD-1

December 8, 2008

Mr. Steven W. Highter, P.E.
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601

Dear Mr. Highter:

**NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT**
**CLEARWATER PROGRAM MASTER FACILITIES PLAN**
**COUNTY OF LOS ANGELES**

Thank you for the opportunity to review the Notice of Preparation/Environmental Impact Report for the subject project. The Clearwater Program Master Facilities Plan for the Sanitation Districts of Los Angeles County's Joint Outfall System. The Joint Outfall System encompasses 73 of the 78 cities in the Sanitation Districts' service area as well as some unincorporated County areas.

The proposed Master Facilities Plan will assess the wastewater conveyance, wastewater treatment, solids processing, biosolids management, and effluent management needs for the Sanitation Districts of Los Angeles County's Joint Outfall System. A major component of the Master Facilities Plan will be the possible construction of a new tunnel and ocean outfall to convey treated wastewater from the Sanitation Districts' Joint Water Pollution Control Plant to the Pacific Ocean.

We do not have any specific comments at this time, although we would like the opportunity to review the necessary Environmental Impact Reports and Traffic Studies on a project-by-project basis for any potential traffic impacts on County and County/City roadways and intersections. The traffic impact study should also address the cumulative impacts generated by this and nearby developments including the level of service analysis for the affected roadways and intersections. Upon identifying an impact, the traffic study must propose feasible mitigation measures. A copy of Traffic Impact Analysis Report Guidelines may be obtained on the County of Los Angeles Department Public Works' website at http://dpw.lacounty.gov/traffic.

DOC # LeBrun T.

If you have any further questions regarding traffic comment, please contact Ms. Lindsay Sagorski of our Traffic Studies Section at (626) 300-4848.

If you have any other questions, please contact Mr. Toan Duong at (626) 458-4945.

Very truly yours,

GAIL FARBER
Director of Public Works

for DENNIS HUNTER, PLS PE
Assistant Deputy Director
Land Development Division

MA:ca
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THE PORT
OF LOS ANGELES
425 S. Palos Verdes Street Post Office Box 151 San Pedro, CA 90733-0151 TEL/TDD 310 SEA-PORT www.portoflosangeles.org

Antonio R. Villaraigosa | *Mayor, City of Los Angeles*

Board of Harbor Commissioners: S. David Freeman, *President*; Jerilyn López Mendoza, *Vice President*; Kaylynn L. Kim; Douglas P. Krause; Joseph R. Radisich

Geraldine Knatz, Ph.D | *Executive Director*

November 18, 2008

Steven W. Highter, P.E.
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill road
Whittier, CA 90601

**SUBJECT: COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY – CLEARWATER PROGRAM MASTER FACILITIES PLAN: NOTICE OF PREPARATION**

Dear Mr. Highter:

Thank you for the opportunity to review the Notice of Preparation (NOP) for the County Sanitation Districts of Los Angeles County – Clearwater Program Master Facilities Plan. The project consists of the preparation of Clearwater Program Master Facilities Plan (MFP) for the Sanitation Districts of Los Angeles County's (Sanitation Districts) Joint Outfall System (JOS). The Los Angeles Harbor Department is a proprietary Department of the City of Los Angeles and has jurisdiction over tidelands trust property the form the Harbor District, which is also called the Port of Los Angeles. We are commenting on your NOP since one or more outfall pipe alignments pass through or under Harbor District properties and have the potential to effect Port operations and/or effect the Harbor environment.

## Project Description

The JOS encompasses 73 of the 78 cities in the Sanitation Districts' service area, as well as some unincorporated county areas. The MFP will assess the wastewater conveyance, wastewater treatment, solids processing, biosolids management, and effluent management needs of the JOS through the year 2050, and recommend specific improvements to meet those needs. A major component of the MFP will be the possible construction of a new tunnel and ocean outfall to convey treated wastewater from the Sanitation Districts' Joint Water Pollution Control Plant (JWPCP) in Carson to the Pacific Ocean, where it would be discharged offshore at a depth of approximately 190 feet. We further understand that there is the possibility of construction on Port of Los Angeles (POLA) property as a result of this project.

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**General Comments**

We have the following general comments related to Harbor Department jurisdiction, alternatives and environmental analysis.

Jurisdictional Issues. One or more of the project alternative alignments will pass under/through Harbor District Property and may require staging areas on Department Property. Activities on Harbor District property will require Department approvals including issuance of a Coastal Development Permit and issuance of an Engineering Permit. Therefore, the EIR needs to identify the Harbor Department as a Responsible Agency. In this regard, the Department will need to utilize your EIR as the CEQA evaluation for our approvals and the content of the EIR must meet certain requirements including City of Los Angeles CEQA significance criteria. We also have CEQA Guidelines we can share with you. We would be happy to meet with you prior to your preparation of the Draft EIR to discuss specific requirements.

Alternative/Project Analysis. The document should include a robust alternatives analysis that supports selection of a preferred alignment based on feasibility and avoidance and reduction of environmental effects. The Draft EIR should identify the preferred/proposed alternative. Since it is our understanding this will be a combined CEQA/NEPA evaluation, the environmental analysis of a reasonable range of alternatives needs to be done on a coequal basis. The Project, or a Project alternative, needs to include consideration of removal of the TITP outfall from its discharge location within the Harbor.

Areas of Environmental Concerns. While we believe your checklist generally provides adequate coverage, we want to ensure that the environmental analysis in the DEIR addresses the following technical areas/issues.

- Effects of the project on water quality, sediments and hydrology of the harbor and outside the breakwater.
- Effects of the project on marine and sensitive biological resources within the harbor.
- Construction emissions in the Harbor District and application of appropriate controls on construction equipment consistent with our construction emission guidelines (see attached performance requirements).
- Effects of construction activities on traffic and transportation within the Harbor District.

- Handling and disposal of waste/hazardous materials and backfilling associated with preparation of laydown/staging areas and drilling activities within the Harbor District.
- Seismic design and safety and the potential for the project to exacerbate facility and personal loss in the event of an earthquake.
- Effects of the Harbor operations and environment in the event of upset.
- The document needs to include a robust cumulative analysis. We have provided a list of projects we currently address in our environmental documents.

**Specific Comments**

Section 4.2.2 (Page 7-8): It should be made clear that the construction shaft site is temporary in nature and the site would be returned to the owner (i.e. POLA in case the POLA shaft location alternative is selected) for use at the completion of the project.

- Section 5.2 (Page 12, paragraph 2): Clarify which methodology or combination of methodologies will be used. There are several listed in the previous paragraph.

- Section 5.4 (Page 14, paragraph 2): Please explain how, in the context of this project, air emissions estimates will correlate with influent water quality.

- Tenant concern (Page 20-22): How will all geological issues including, but not limited to, vibrations affect existing POLA tenants?

- Section 5.16 (Page 26-27): The approach should also consider relevant projects within the alignments that are going on at the same time (please see attached cumulative project list).

We are disappointed that you did not conform your public review period to that of the NOI issued by the federal agency. This creates an unnecessary burden and confusion upon agencies and the public and defeats the purpose of carrying out a combined document "in the interest of efficiency and to avoid duplication of effort." In this case our effort.

Finally, we understand that you have been conducting outreach to the local communities. If you have not already, we would recommend that at some time before you begin your analysis, that you conduct some outreach to the Port Community Advisory Committee and in particular their EIR Subcommittee. We would be able to enquire as to the subcommittee's interest and arrange a meeting if you would like.

If you have any questions or need any additional information, please contact Talitha Sweaney of my staff at (310) 732-7693 or by email at tsweany@portla.org.

Sincerely,

RALPH G. APPY, Ph.D.
Director of Environmental Management

Enclosures

## PART 1 – GENERAL

### 1.1 WORK INCLUDED

A. SITE CONSTRUCTION PERFORMANCE REQUIREMENTS consists of specific measures and practices to protect the environment, be socially responsible, provide for the economic development of the Port and include air quality, materials management, energy use, health and safety, and labor sustainability measures.

### 1.2 RELATED WORK

A. REGULATORY REQUIREMENTS Section 01 41 00

### 1.3 REFERENCES

A. Board of Harbor Commissioners Resolution No. 6518

### 1.4 DEPARTMENT DIESEL FUEL REQUIREMENTS

A. Ships shall use low-sulfur fuel (maximum sulfur content of 0.2 percent) in auxiliary engines, main engines, and boilers within 40 nm of Point Fermin.

B. Other equipment shall use low-sulfur fuel (maximum sulfur content of 0.2 percent) in engines at all times.

### 1.5 DEPARTMENT DREDGING REQUIREMENTS

**(Spec writer to include if power is available)**

A. Dredging equipment shall be electric.

### 1.6 DEPARTMENT DIESEL-POWERED EQUIPMENT REQUIREMENTS

A. Vessels:

1. Ships and barges delivering construction materials to construction site shall comply with the expanded Vessel Speed Reduction Program (VSRP) of 12 knots within 40 nautical miles (nm) of Point Fermin to the Precautionary Area.

B. Harbor Craft:

**(Spec writer to include the appropriate condition based upon anticipated NTP)**

1. **(Through December 31, 2010):** Harbor craft with C1 and C2 marine engines shall achieve a minimum emission reduction equivalent to a U.S. Environmental Protection Agency (EPA) Tier-2 marine engine.

2. **(From January 1, 2011 on):** Harbor craft with C1 or C2 marine engines shall utilize a U.S. EPA Tier-3 engine, or cleaner.

C. On-Road Trucks

**(Spec writer to include the appropriate condition based upon anticipated NTP)**

1. **(Through December 31, 2011):** On-road diesel trucks with a gross vehicle weight rating (GVWR) of 19,500 pounds or greater used on Project shall comply with EPA 2004 on-road emission standards for PM10 and NOx (0.10 g/bhp-hr PM10 and 2.0 g/bhp-hr NOx) and shall be equipped with a CARB verified Level 3 device.

2. **(From January 1, 2012 on):** On-road diesel trucks GVWR of 19,500 pounds or greater used on Project shall comply with EPA 2007 on-road emission standards for PM10 and NOx (0.01 g/bhp-hr and 0.20 g/bhp-hr.

D. Diesel powered off-road Construction Equipment:

1. Diesel powered off-road construction equipment is defined as any self-propelled land vehicle used for construction purposes, using diesel fuel, having a manufacturer's maximum gross vehicle weight rating of 6,000 lb (2,721.5 kg) or more, with a power rating greater than 50 hp.

2. High-pressure fuel injectors shall be installed on construction equipment engines.

3. Construction equipment shall be maintained in conformance with the manufacturers' specifications.

4. Engines on construction equipment shall be shut down when not in use more than 5 minutes.

**(Spec writer to include the appropriate condition based upon anticipated NTP)**

5. **(Through December 31, 2011):** Off-road diesel-powered construction equipment greater than 50 horsepower (hp), shall meet Tier-2 off-road emission standards, at a minimum and shall be retrofitted with a CARB-certified Level 3 diesel emissions control device.

6. **(From January 1, 2012 to December 31, 2014):** Off-road diesel-powered construction equipment greater than 50 hp, shall meet Tier-3 off-road emission standards, at a minimum and shall be retrofitted with a CARB certified Level 3 diesel emissions control device.

7. **(From January 1, 2015 on):** Off-road diesel-powered construction equipment greater than 50 hp, shall meet Tier-4 off-road emission standards and shall be retrofitted with a CARB certified Level 3 diesel emissions control device.

E. Exceptions to Harbor Craft, On-Road Truck, and Construction Equipment requirements.

1. The above measures shall be met, unless one of the following circumstances exists and the Contractor is able to provide proof that the circumstance exists:

   a. A piece of specialized equipment is unavailable in a controlled form, or within the required Tier level within the State of California, including through a leasing agreement.

   b. Contractor has applied for AQMD incentive funds to put controls on a piece of uncontrolled equipment planned for use on the Project, but the application process is not yet approved, or the application has been approved, but funds are not yet available.

c. Contractor has ordered a control device for a piece of equipment planned for use on the Project, or the Contractor has ordered a new piece of controlled equipment to replace the uncontrolled equipment, but that order has not been completed by the manufacturer or dealer. In addition, for this exemption to apply, Contractor shall attempt to lease controlled equipment to avoid using uncontrolled equipment, but no dealer within 200 miles of the project has the controlled equipment available for lease.

F. Fugitive Dust/Grading Activities:

1. Active grading sites shall be watered at least 3 times per day to control fugitive dust.

2. Apply approved non-toxic chemical soil stabilizers to inactive construction areas or replace groundcover in disturbed areas.

3. Provide temporary wind fencing around sites being graded or cleared.

4. Suspend soil disturbance activities when winds exceed 25 mph or when visible dust plumes emanate from a site. Stabilize disturbed areas if construction is delayed.

5. Cover open storage piles (greater than 3 feet tall and a total surface area of 150 square feet) with a plastic tarp or chemical dust suppressant.

6. Haul waste materials off-site in conformance with the minimum Water Quality Protection Requirements of the REGULATORY REQUIREMENTS Section.

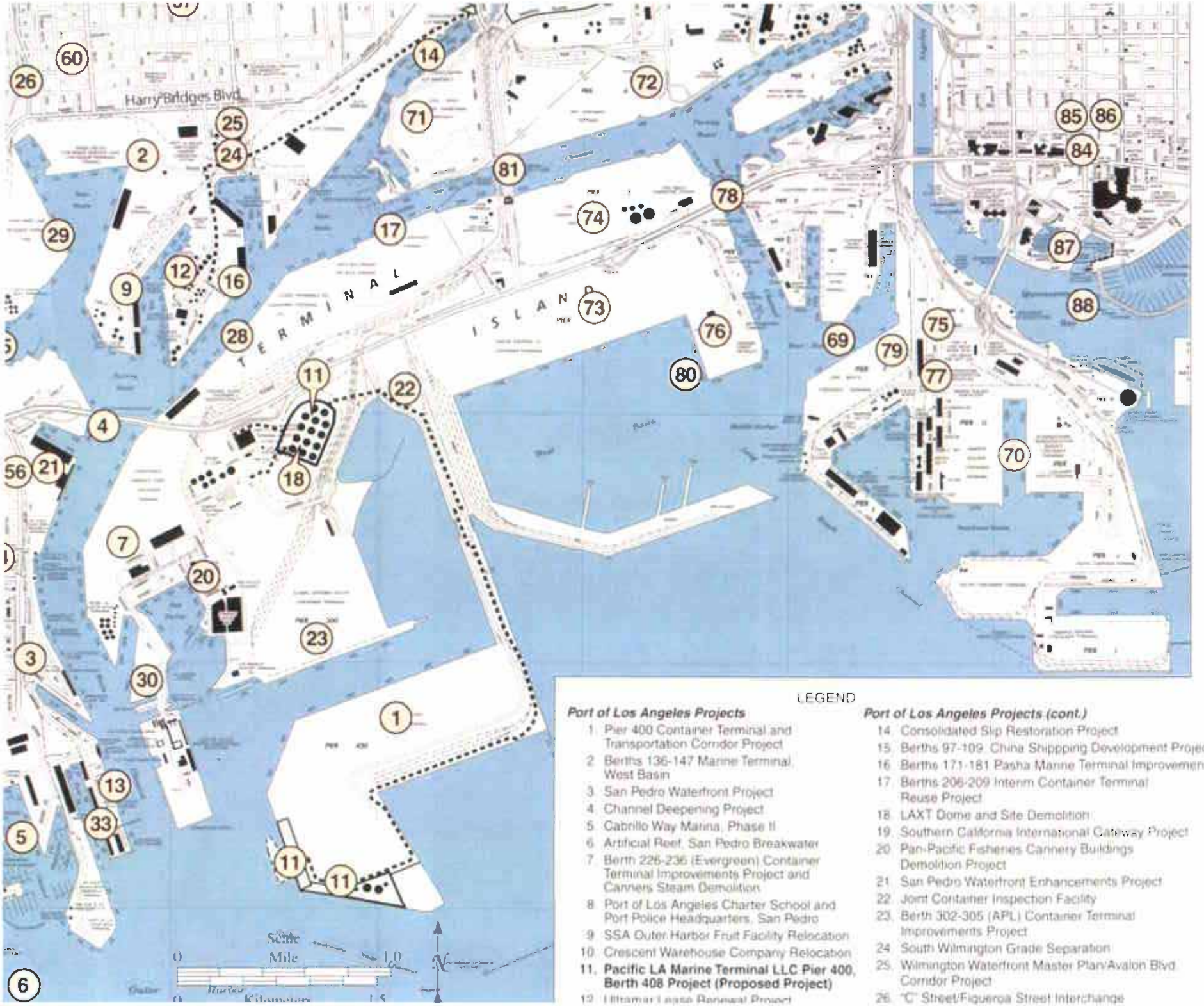
## Part 2 – PRODUCTS

Not applicable

## Part 3 – EXECUTION

Not applicable

END OF SECTION




LEGEND

***Port of Los Angeles Projects***

1. Pier 400 Container Terminal and Transportation Corridor Project
2. Berths 136-147 Marine Terminal, West Basin
3. San Pedro Waterfront Project
4. Channel Deepening Project
5. Cabrillo Way Marina, Phase II
6. Artificial Reef, San Pedro Breakwater
7. Berth 226-236 (Evergreen) Container Terminal Improvements Project and Canners Steam Demolition
8. Port of Los Angeles Charter School and Port Police Headquarters, San Pedro
9. SSA Outer Harbor Fruit Facility Relocation
10. Crescent Warehouse Company Relocation
11. **Pacific LA Marine Terminal LLC Pier 400, Berth 408 Project (Proposed Project)**
12. Ultramar Lease Renewal Project

***Port of Los Angeles Projects (cont.)***

14. Consolidated Slip Restoration Project
15. Berths 97-109 China Shipping Development Project
16. Berths 171-181 Pasha Marine Terminal Improvements
17. Berths 206-209 Interim Container Terminal Reuse Project
18. LAXT Dome and Site Demolition
19. Southern California International Gateway Project
20. Pan-Pacific Fisheries Cannery Buildings Demolition Project
21. San Pedro Waterfront Enhancements Project
22. Joint Container Inspection Facility
23. Berth 302-305 (APL) Container Terminal Improvements Project
24. South Wilmington Grade Separation
25. Wilmington Waterfront Master Plan/Avalon Blvd Corridor Project
26. "C" Street/Figueroa Street Interchange

***Potential Port***

34. Termina
35. Extende
36. Shuttle
37. Origin/D
38. Virtual C
39. Increase
40. Union P
41. Optical
42. Truck Di

***Community o***

43. 15th Str
44. Pacific
45. Cabrillo
46. Gas Sta
47. Fast Fo
48. Mixed U
49. Condos
50. Pacific T
51. Single F
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53. Target (
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56. Condos

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61. Vermont

***Projects in Hi***

62. 1437 Lo
63. Harbor
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65. Drive-th
66. Ponte V
67. Wareho
68. Sepulve

***Port of Long***

69. Middle
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73. Pier T T
74. Pier S N
75. Admins
76. Pier T L
77. San Pe
78. Gerald
79. Chemoi
80. POLB Ir
Dredgin

***ACTA and Ca***

81. Schuyle
82. I-710 M
83. Edison

***City of Long***

84. Renais
85. D'Orsay
86. City Pla
87. The Pik
88. Queens

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## Table 4-1. Related and Cumulative Projects

| *No. in Figure 4-1* | *Project Title and Location* | *Project Description* | *Project Status*[1] |
|---|---|---|---|
| | | ***Port of Los Angeles Projects*** | |
| 1 | Pier 400 Container Terminal and Transportation Corridor Project, Port of Los Angeles | Element of the 2020 Deep Draft Navigation Improvements Plan: dredging, land filling, and marine terminal construction. The entire Pier 400 site is on a recently constructed landfill in the Port of Los Angeles Outer Harbor. The project is a two-phase development of Pier 400 into a 484-acre (196-hectare) container terminal with rail, highway, and utility access. Phase I consisted of construction of rail and highway access and the first 334 acres (135 hectares) of a marine container terminal, including buildings, a wharf, and an intermodal rail yard. Phase II consisted of construction of the remaining 150 acres (61 hectares) into a container terminal. The EIR certified for the project and the Final EIS identified significant air, transportation, and noise and vibration impacts. | Approved project. Phase I construction completed and terminal opened August 2002. Phase II construction started in April 2003 and was completed in September 2004. |
| 2 | Berths 136-147 (TraPac) Marine Terminal, West Basin, Port of Los Angeles | Element of the West Basin Transportation Improvement Projects. Reconfiguration of wharves and backlands. Expansion and redevelopment of the TraPac Terminal. | FEIR certified by Board of Harbor Commissioners December 2007. Construction expected mid/late 2008 to 2010 and 2015 to 2020. |
| 3 | San Pedro Waterfront Project, Port of Los Angeles | The "San Pedro Waterfront" Project is a 5 to 7 year plan to develop along the west side of the Main Channel, from the Vincent Thomas Bridge to the 22nd Street Landing Area Parcel up to and including Crescent Avenue. Key components of the project include construction of a North Harbor Promenade, construction of a Downtown Harbor Promenade, construction of a Downtown Water Feature, enhancements to the existing John S. Gibson Park, construction of a Town Square at the foot of 6th Street, construction of a 7th Street Pier, construction of a Ports O' Call Promenade, development of California Coastal Trail along the waterfront, construction of additional cruise terminal facilities, construction of a Ralph J. Scott Historic Fireboat Display, relocation of the Catalina Cruises Terminal and the SS Lane Victory, extension of the Red Car line, and related parking improvements. | An NOP/NOI was released in August 2005. A revised NOP/NOI was released in December 2006. Draft EIR/EIS being prepared. Construction expected 2010-2015. |

**Table 4-1. Related and Cumulative Projects (continued)**

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| | | ***Port of Los Angeles Projects (continued)*** | |
| 4 | Channel Deepening Project, Port of Los Angeles | Dredging and sediment disposal. This project deepened the Port of Los Angeles Main Channel to a maximum depth of –53 ft mean lower low water (MLLW; lesser depths are considered as project alternatives) by removing between approximately 3.94 million and 8.5 million cubic yards of sediments. The sediments were disposed at several sites for up to 151 acres (61 hectares) of landfill. The EIR/EIS certified for the project identified significant biology, air, and noise impacts. A Supplemental EIS/EIR is being prepared for new fill locations. The Additional Disposal Capacity Project would provide approximately 4 million cubic yards of disposal capacity needed to complete the Channel Deepening Project and maximize beneficial use of dredged material by constructing lands for eventual terminal development and provide environmental enhancements at various locations in the Port of Los Angeles. | SNOI/SNOP released in October 2005. SEIS/SEIR anticipated mid 2008. Construction expected 2009-2010. |
| 5 | Cabrillo Way Marina, Phase II, Port of Los Angeles | Redevelopment of the old marinas in the Watchorn Basin and development of the backland areas for a variety of commercial and recreational uses. | EIR certified December 2, 2003. Construction anticipated 2008-2009. |
| 6 | Artificial Reef, San Pedro Breakwater, Port of Los Angeles | Development of an artificial reef site south of the San Pedro Breakwater. Provides opportunity for suitable reuse of clean construction materials and creates bottom topography to promote local sport fishing. | Negative Declaration issued and certified. Project proceeding (2006-2010). |
| 7 | Berth 226-236 (Evergreen) Container Terminal Improvements Project and Canners Steam Demolition. | Proposed redevelopment of existing container terminal, including improvements to wharves, adjacent backland, crane rails, lighting, utilities, new gate complex, grade crossings and modification of adjacent roadways and railroad tracks. Project also includes demolition of two unused buildings and other small accessory structures at the former Canner's Steam Plant in the Fish Harbor area of the Port. | EIR/EIS to be prepared. NOP/NOI anticipated in 2008. Construction expected 2010-2013. |
| 8 | Port of Los Angeles Charter School and Port Police Headquarters, San Pedro, Port of Los Angeles | Proposal to lease property for the Port of Los Angeles Charter School and to construct/develop a Port Police Headquarters and office. 330 S. Centre Street, San Pedro. | EIR certified in August 2005. Construction began in 2008 and expected to be complete in 2010. |
| 9 | SSA Outer Harbor Fruit Facility Relocation, Port of Los Angeles | Proposal to relocate the existing fruit import facility at 22nd and Miner to Berth 153. | On hold. |

**Table 4-1. Related and Cumulative Projects (continued)**

| *No. in Figure 4-1* | *Project Title and Location* | *Project Description* | *Project Status* |
|---|---|---|---|
| | | ***Port of Los Angeles Projects (continued)*** | |
| 10 | Crescent Warehouse Company Relocation, Port of Los Angeles | Relocate the operations of Crescent Warehouse Company from Port Warehouses 1, 6, 9, and 10 to an existing warehouse at Berth 153. Relocate Catalina Freight operations from Berth 184 to same building at Berth 153. | MND to be prepared. Release anticipated in 2008. |
| **11** | **Pacific LA Marine Terminal (formerly Pacific Energy) Oil Marine Terminal, Pier 400, Port of Los Angeles** | **Proposal to construct a Crude Oil Receiving Facility on Pier 400 with tanks at Pier 400 and on Terminal Island, as well as construct new pipelines between berth, storage tanks, and existing pipeline systems.** ***(Project evaluated in this SEIS/SEIR)*** | **NOI/NOP released in June 2004.** |
| 12 | Ultramar Lease Renewal Project, Port of Los Angeles | Proposal to renew the lease between the Port of Los Angeles and Ultramar Inc., for continued operation of the marine terminal facilities at Berths 163-164, as well as associated tank farms and pipelines. Project includes upgrades to existing facilities to increase the proposed minimum throughput to 10 million barrels per year (mby), compared to the existing 7.5 mby minimum. | Project EIR under preparation; Final EIR expected in 2008. NOP released for public review in April 2004. |
| 13 | Westway Decommissioning | Decommissioning of the Westway Terminal along the Main Channel (Berths 70-71). Work includes decommissioning and removing 136 storage tanks with total capacity of 593,000 barrels (bbl). | Remedial planning underway. Decommissioning anticipated 2009. |
| 14 | Consolidated Slip Restoration Project | Remediation of contaminated sediment at Consolidated Slip at Port of Los Angeles. Remediation may include capping sediment or removal/disposal to an appropriate facility. Work includes capping and/or treatment of approximately 30,000 cubic yards of contaminated sediments. | Remedial actions are being evaluated in conjunction with Los Angeles Regional Water Quality Control Board (LARWQCB) and U.S. Environmental Protection Agency (USEPA). |
| 15 | Berths 97-109, China Shipping Terminal Development Project | Development of the China Shipping Terminal Phase I, II, and III including wharf construction, land fill and terminal construction and backland development. | Draft EIR/EIS released August 2006. Phase I construction completed in 2004. Re-circulated Draft EIR/EIS released April 2008. Construction expected 2009-2015. |
| 16 | Berths 171-181, Pasha Marine Terminal Improvements Project, Port of Los Angeles | Redevelopment of existing facilities at Berths 171-181 as an omni (multi-use) facility. | Project EIR on hold. |
| 17 | Berths 206-209 Interim Container Terminal Reuse Project, Port of Los Angeles | Proposal to allow interim reuse of former Matson Terminal while implementing green terminal measures. | Final EIR certified. Construction on hold. |

**Table 4-1. Related and Cumulative Projects (continued)**

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| | | ***Port of Los Angeles Projects (continued)*** | |
| 18 | LAXT Dome and Site Demolition | Demolition and clean up of existing storage dome and associated buildings on LAXT property. | Demolition began in 2007. |
| 19 | Southern California International Gateway Project (SCIG), Port of Los Angeles | Construction and operation of a 157 acre dock rail yard intermodal container transfer facility (ICTF) and various associated components, including the relocation of an existing rail operation. | Project EIR under preparation. NOP released September 30, 2005. DEIR expected in Fall 2008. |
| 20 | Pan-Pacific Fisheries Cannery Buildings Demolition Project, Port of Los Angeles | Demolition of two unused buildings and other small accessory structures at the former Pan-Pacific Cannery in the Fish Harbor area of the Port. | NOP released October 2005. Draft EIR released July 2006. Final EIR under preparation. Demolition expected mid to late 2008. |
| 21 | San Pedro Waterfront Enhancements Project, Port of Los Angeles | Project includes improving existing and development of new pedestrian corridors along the waterfront (4 acres), landscaping, parking, increased waterfront access from upland areas, and creating 16 acres of public open space. | MND approved in April 2006. Construction to begin in early 2008 and will be completed in 2009. |
| 22 | Joint Container Inspection Facility, Port of Los Angeles and Port of Long Beach | Construction and operation of a facility to be used to search and inspect random and suspicious containers arriving at the Ports of Los Angeles and Long Beach. | In planning. EIR to be prepared. |
| 23 | Berth 302-305 (APL) Container Terminal Improvements Project | Container terminal and wharf improvements project including a terminal expansion area and new berth on the east side of Pier 300. Currently includes 40 acres of fill that was completed as part of the Channel Deepening Project (number 4 above). | EIR/EIS to be prepared. NOP/NOI anticipated in 2008. Construction expected 2010-2012. |
| 24 | South Wilmington Grade Separation | An elevated grade separation would be constructed along a portion of Fries Avenue or Marine Avenue, over the existing rail line tracks, to eliminate vehicular traffic delays that would otherwise be caused by trains using the existing rail line and the new ICTF rail yard. The elevated grade would include a connection onto Water Street. There would be a minimum 24.5-foot clearance for rail cars traveling under the grade separation. | Conceptual planning. Current planning indicates summer 2011 completion. |
| 25 | Wilmington Waterfront Master Plan (Avalon Blvd. Corridor Project) | Planned development intended to provide waterfront access and promoting development specifically along Avalon Boulevard. | NOP issued March 2008. Draft EIR anticipated Summer 2008. Construction expected early 2009. |

**Table 4-1. Related and Cumulative Projects (continued)**

| *No. in Figure 4-1* | *Project Title and Location* | *Project Description* | *Project Status* |
|---|---|---|---|
| | | ***Port of Los Angeles Projects (continued)*** | |
| 26 | "C" Street/Figueroa Street Interchange | The "C" Street/ Figueroa Street interchange would be redesigned to include an elevated ramp from Harry Bridges Boulevard to the I-110 Freeway, over John S. Gibson Blvd. There would be a minimum 15-foot clearance for vehicles traveling on John S. Gibson Boulevard. An additional extension would connect from Figueroa Street to the new elevated ramp, over Harry Bridges Blvd. | Conceptual planning. Caltrans approval obtained on Project Study Report. |
| 27 | Port Transportation Master Plan | Port-wide transportation master plan for roadways in and around its facilities. Present and future traffic improvement needs are being determined, based on existing and projected traffic volumes. Some improvements under consideration include: I-110/SR-47/Harbor Blvd. interchange improvements; south Wilmington grade separations; and additional traffic capacity analysis for the Vincent Thomas Bridge. | Conceptual planning completed by the end of 2006. |
| 28 | Berths 212-224 (YTI) Container Terminal Improvements Project | Wharf modifications at the YTI Marine Terminal Project involves wharf upgrades and backland reconfiguration, including new buildings. | EIR/EIS to be prepared. NOP/NOI anticipated in 2008. Construction expected 2010-2013. |
| 29 | Berths 121-131 (Yang Ming) Container Terminal Improvements Project | Reconfiguration of wharves and backlands. Expansion and redevelopment of the Yang Ming Terminal. | EIR/EIS to be prepared. NOP/NOI anticipated in 2008. Construction expected 2010-2013. |
| 30 | Southwest Marine Demolition Project | Demolition of buildings and other small accessory structures at the Southwest Marine Shipyard. | Draft EIR released September 2006. Final EIR under preparation. Demolition anticipated late 2008. |
| 31 | I-110 / SR 47 Connector Improvement Program | Program may include "C" Street/I-110 access ramp intersection improvements, I-110 NB Ramp/John S. Gibson Blvd. intersection improvements, and SR 47 On-and Off-Ramp at Front Street. These projects would reduce delays and emissions in the I-110/SR 47 area and improve safety and access. | Conceptual planning. |
| 32 | Inner Cabrillo Beach Water Quality Improvement Program | Phased improvements at Cabrillo Beach to reduce the wet and dry weather high concentrations of bacteria. Includes sewer and storm drain work, sand replacement, bird excluders, and circulation improvements (groin removal). | Sand replacement phase above high tide line completed in 2007. Additional sand replacement below high tide line anticipated in 2008. |
| 33 | Proposed Marine Research Center | Up to 28 acre site for potential marine research facility at City Dock No. 1. | Conceptual planning. |

**Table 4-1. Related and Cumulative Projects (continued)**

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| ***Port of Los Angeles and/or Port of Long Beach Potential Port-Wide Operational Projects*** | | | |
| 34 | Terminal Free Time | Industry supported program to reduce container storage time and use gates at off-peak travel times. | Program in progress. |
| 35 | Extended Terminal Gates (Pier Pass) | Industry supported program to use economic incentives to encourage cargo owners to use terminal gates during off-peak hours. | Program in progress. |
| 36 | Shuttle Train/Inland Container Yard | Alameda Corridor Transportation Authority (ACTA) program to encourage rail shuttle service between the ports' on-dock rail facilities and a rail facility in Colton (in the Inland Empire). The pilot program will consist of a daily train to and from Colton. The containers will be trucked between the Colton rail facility and the beneficial cargo owners' facility. | Preliminary study in progress. |
| 37 | Origin/Destination and Toll Study | Joint study of the Ports of Los Angeles and Long Beach to identify the origin and destination of international containers in the Los Angeles area, to determine the location of warehouses and identify the routes truck drivers use to move containers to and from the Ports. The bridges serving Terminal Island (Vincent Thomas, Gerald Desmond and Heim Bridge) are not currently designed to handle the trade volumes projected at the San Pedro Bay Ports. In order to identify funding mechanisms to replace/enhance these bridges, the Ports are conducting a toll study to explore potential funding sources for bridge replacement and truck driver behavior if tolls were assessed on the bridges. | Study in progress. |
| 38 | Virtual Container Yard | Joint program of ACTA and the Ports of Los Angeles and Long Beach to explore implementing a system that would match an empty container from an import move to one from an empty export move. | Conceptual planning. |
| 39 | Increased On-Dock Rail Usage | Joint program of ACTA, the Ports of Los Angeles and Long Beach, shipping lines, and terminal operators to consolidate neighboring terminals' intermodal volume to create larger trains to interior points, thereby reducing need for truck transportation. | Conceptual planning. |
| 40 | Union Pacific Railroad ICTF Modernization Project | UP proposal to modernize existing intermodal yard four miles from the Port. | Conceptual planning. Application submitted and the EIR is being completed by the Joint Powers Authority. |

**Table 4-1. Related and Cumulative Projects (continued)**

| *No. in Figure 4-1* | *Project Title and Location* | *Project Description* | *Project Status* |
|---|---|---|---|
| ***Port of Los Angeles and/or Port of Long Beach Potential Port-Wide Operational Projects (continued)*** | | | |
| 41 | Optical Character Recognition | Ports terminals have implemented OCR technology, which eliminates the need to type container numbers in the computer system. This expedites the truck driver through terminal gates. | Ongoing planning and implementation. |
| 42 | Truck Driver Appointment System | Appointment system that provides a pre-notification to terminals regarding which containers are planned to be picked up. | Conceptual planning. |
| ***Community of San Pedro Projects*** | | | |
| 43 | 15th Street Elementary School, San Pedro | Los Angeles Unified School District construction of additional classrooms at 15th Street Elementary School. | Construction completed and school operating. Completed in 2006. |
| 44 | Pacific Corridors Redevelopment Project, San Pedro | Development of commercial/retail, manufacturing, and residential components. Construction underway of four housing developments and Welcome Park. | Project underway. Estimated 2032 completion year according to Community Redevelopment Agency of Los Angeles. |
| 45 | Cabrillo Marine Aquarium Expansion, San Pedro | Expansion of existing Cabrillo Marine Aquarium. | Construction complete. |
| 46 | Gas station and mini-mart | 6-pump gas station and 1,390 sf mini-mart at 311 N. Gaffey Street, San Pedro (north of Sepulveda Street). | Project on hold. No construction has started. |
| 47 | Fast Food Restaurant w/drive-thru | Construct fast food restaurant with drive through (expand from existing 3000 sf to 4816 sf restaurant). 303 S. Gaffey Street (at 3rd Street), San Pedro. | Construction is complete and restaurant is operating. |
| 48 | Mixed use development, 407 Seventh Street | Construct 5,000 sf retail and 87-unit apartment complex. 407 W. Seventh Street (at Mesa St.), San Pedro. | In final stages of construction. |
| 49 | Condominiums, 28000 Western Ave. | Construct 140 condominium units. 28000 S. Western Avenue, San Pedro. | In final stages of construction. Building permit cleared March 2006; LADOT Planning Department has no estimated completion year. |
| 50 | Pacific Trade Center | Construct 220 housing unit apartments. 255 5th Street, San Pedro (near Centre Street). | In initial stage of construction. Building permit cleared August 2006, but LADOT Planning Department has no estimated completion year. |
| 51 | Single Family Homes (Gaffey Street) | Construct 135 single-family homes. About 2 acres. 1427 N. Gaffey St (at Basin St), San Pedro. | In construction. Estimated 2009 completion year according to LADOT Planning Department. |

## Table 4-1. Related and Cumulative Projects (continued)

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| | | ***Community of San Pedro Projects (continued)*** | |
| 52 | Mixed-use development, 281 W 8th Street | Construct 72 condos & 7,000 sf retail. 281 West 8th Street (near Centre Street), San Pedro. | No construction started. LADOT Planning Department has no estimated completion year. |
| 53 | Target (Gaffey Street) | Construct 136,000 sf discount superstore. 1605 North Gaffey Street, San Pedro (at W. Capitol Drive). | No construction has started<br>Estimated 2009 completion year, according to LADOT Planning Department. |
| 54 | Palos Verdes Urban Village | Construct 251 condos & 4,000 sf retail space. 550 South Palos Verdes Street, San Pedro. | No construction has started. Estimated 2011 completion year, according to LADOT Planning Department. |
| 55 | Temporary Little League Park | Construction of temporary baseball fields for the Eastview Little League at top of Knoll Hill in San Pedro; Knoll Hill Dog Park moved to bottom of Knoll Hill. | Construction completed in fall 2007. |
| 56 | Condos, 319 N Harbor Blvd | Construction of 94 unit residential condominiums, 319 N Harbor Blvd, San Pedro. | LADOT Planning Department has no estimated completion year. |
| | | ***Community of Wilmington Projects*** | |
| 57 | Banning Elementary School #1, 500 North Island Avenue, Wilmington | Banning Elementary School No. 1 is a two-building elementary school consisting of one two-story classroom building with subterranean parking garage and a one-story multipurpose building. The school also provides about 2 acres of playground and green space. | Construction completed and school operating. Completed in 2006. |
| 58 | East Wilmington Greenbelt Community Center, Wilmington | 9,800-square-foot community building, a 25-space parking lot, and landscaped areas. | Construction complete; center opened in 2006. |
| 59 | Distribution center and warehouse | 135,000 sf distribution center and warehouse on 240,000 sf lot w/47 parking spaces at 755 East L Street, (at McFarland Avenue) in Wilmington. | No construction has started; lot is vacant and bare. LADOT Planning Department has no estimated completion year. |
| 60 | Dana Strand Public Housing Redevelopment Project | The existing facility is being torn down and redeveloped to provide a 116-unit affordable housing complex with multifamily rental units, senior units and affordable homes for sale. The plans also include a day care center, lifelong learning center, parks and landscaped open space. | Under construction (construction started in 2005). |
| 61 | Vermont Christian School Expansion | Private school expansion to accommodate 72 additional students, for a total of 222 students. | LADOT Planning Department has no estimated completion year. |

**Table 4-1. Related and Cumulative Projects (continued)**

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| | | ***Projects in Harbor City, Lomita, and Torrance*** | |
| 62 | 1437 Lomita Boulevard Condominiums | Construct 160 condominium units and demolish existing closed hospital.1437 Lomita Boulevard (at Senator Avenue), Harbor City. | Construction is complete and in operation. |
| 63 | Harbor City Child Development Center | Conditional use permit to open 50-student pre-school at existing church building (25000 South Normandie Avenue, Harbor City, at Lomita Boulevard). | Public hearing in August 2006. |
| 64 | Kaiser Permanente South Bay Master Plan | Construct 303,000 sf medical office building, 42,500 sf records center / office / warehouse, 260 hospital beds. 25825 Vermont Street, Harbor City (at Pacific Coast Hwy). | In Construction. Estimated 2009 completion year, according to LADOT Planning Department. |
| 65 | Drive-through restaurant, Harbor City | Construct 2,448 sf fast food restaurant with drive-through. 1608 Pacific Coast Highway, Harbor City (at President Avenue). | In planning phase. Old building still in operation. |
| 66 | Ponte Vista | Construct 1725 condos, 575 senior housing units, and 4 baseball fields. 26900 Western Avenue (near Green Hills Park), Lomita. Rolling Hills Prep School being developed in an adjacent lot. | DEIR issued November 2006. LADOT Planning Department reports estimated 2012 completion year. |
| 67 | Warehouses, 1351 West Sepulveda Blvd | Construct warehouses with total capacity 400,000 sf. 1351 West Sepulveda Blvd. (at Western Ave.), Torrance. | Project building permit cleared 2/07. LADOT Planning Department estimates completion in 2007. |
| 68 | Sepulveda Industrial Park | Construct 154,105 sf industrial park (6 lots). Sepulveda Industrial Park (TT65665) 1309 Sepulveda Boulevard, Torrance (near Normandie Avenue). | No construction started. LADOT Planning Department has no estimated completion year. |
| | | ***Port of Long Beach Projects*** | |
| 69 | Middle Harbor Terminal Redevelopment, Port of Long Beach | Expansion of an existing marine container terminal in the Middle Harbor area of the Port of Long Beach. The project will involve consolidation of two existing container terminals into one 345-acre (138-hectare) terminal. Construction will include approximately 48 acres (19 hectares) of landfill, dredging, wharf construction; construction of an intermodal rail yard; and reconstruction of terminal operations buildings. The Initial Study prepared for this project identified significant air, public health, transportation, biological, and water quality impacts. | Project EIS/EIR released May 2008. NOP/NOI released December 20, 2005. Anticipated construction 2008-2025. |

**Table 4-1. Related and Cumulative Projects (continued)**

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| | | ***Port of Long Beach Projects (continued)*** | |
| 70 | Piers G & J Terminal Redevelopment Project, Port of Long Beach | Redevelopment of two existing marine container terminals into one terminal. The Piers G and J redevelopment project is in the Southeast Harbor Planning District area of the Port of Long Beach. The project will develop a marine terminal of up to 315 acres by consolidating two existing terminals on Piers G and J and several surrounding parcels. Construction will occur in four phases and will include approximately 53 acres of landfills, dredging, concrete wharves, rock dikes, and road and railway improvements. The EIR prepared for this project identified potentially significant impacts to air quality and geologic resources. | Approved project. Construction underway (anticipated construction period is 2005-2015). |
| 71 | Pier A West Remediation Project, Port of Long Beach | Remediation of approximately 90 acres of oil production land, including remediation of soil and groundwater contamination, relocation of oil wells, filling, and paving. | Project EIR/EIS under preparation. NOP/NOI released January 26, 2006. Expected duration through 2011. |
| 72 | Pier A East, Port of Long Beach | Redevelopment of 32 acres of existing auto storage area into container terminal. | EIR to be prepared. |
| 73 | Pier T, TTI (formerly Hanjin) Terminal, Phase III, Port of Long Beach | Development of a container terminal, liquid bulk facility and satellite launch facility. The Port of Long Beach is redeveloping the former Long Beach Naval Complex on Terminal Island. The project consists of expanding a 300-acre marine container terminal to 375 acres, including a wharf, terminal operations buildings, utilities, and rail yard. Construction includes 22 acres of landfill. The SEIS/EIR certified for this project identified significant air quality, transportation, public health and safety, cultural resources, biological resources, and vibration impacts. | Approved project. Final phase of construction underway. |
| 74 | Pier S Marine Terminal, Port of Long Beach | Development of a 150-acre container terminal and construction of navigational safety improvements to the Back Channel. | EIS/EIR to be prepared. Assessment/ construction expected 2007-2012. |
| 75 | Administration Building Replacement Project, Port of Long Beach | Replacement of the existing Port Administration Building with a new facility on an adjacent site. | EIR being prepared. Assessment/ construction expected 2009-2012. |
| 76 | Sound Energy Solutions-Pier T, Long Beach Liquefied Natural Gas (LNG) Terminal, Port of Long Beach | Construction of a 25-acre (10-hectare) liquefied natural gas (LNG) import terminal facility including pipeline and wharf construction on a portion of Pier T on Terminal Island within the Port of Long Beach. | Final EIR/EIS completed. Project disapproved by Board of Harbor Commissioners January 2007; legal challenge underway. |
| 77 | San Pedro Bay Rail Study | Port-wide rail transportation plan with multiple projects in and around Harbor District. | EIR to be prepared. |

## Table 4-1. Related and Cumulative Projects (continued)

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| | | ***Port of Long Beach Projects (continued)*** | |
| 78 | Gerald Desmond Bridge Replacement Project, Port of Long Beach and Caltrans/FHWA | Replacement of the existing 4-lane Gerald Desmond highway bridge over the Port of Long Beach Back Channel with a new 6- to 8-lane bridge. | NOP/NOI released in 2005. EIR/EA released in 2005; Recirculated EIR/EA being prepared. Anticipated construction 2008-2013. |
| 79 | Chemoil Marine Terminal, Tank Installation, Port of Long Beach | Construction of two storage tanks for refined petroleum products and associated relocation of utilities and reconfiguration of adjoining marine terminal uses between Berths F210 and F211 on Pier F. | NOP released June 2007. EIR to be prepared. |
| 80 | Port of Long Beach Installation Restoration Site 7 (West Basin) Dredging Project | Removal of about 700,000 cubic yards of contaminated sediments at the Port of Long Beach, with beneficial/sustainable reuse of the material in the Pier G landfill. | In planning stages. Dredging is expected in 2008-2009. |
| | | ***Alameda Corridor Transportation Authority and Caltrans Projects*** | |
| 81 | Schuyler Heim Bridge Replacement and State Route (SR) 47 Terminal Island Expressway | ACTA/Caltrans project to replace the Schuyler Heim Bridge with a fixed structure and improve the SR 47/Henry Ford Avenue/Alameda Street transportation corridor by constructing an elevated expressway from the Heim Bridge to SR 1 (Pacific Coast Highway) and flyover from eastbound Ocean Boulevard to northbound SR 47. | ACTA and Caltrans issued Draft EIS/EIR August 2007. Final EIS/EIR expected spring 2008. Anticipated construction 2009-2011 (for SR47 and bridge) and 2015-2017 (for flyover). |
| 82 | I-710 (Long Beach Freeway) Major Corridor Study | Develop multi-modal, timely, cost-effective transportation solutions to traffic congestion and other mobility problems along approximately 18 miles of the I-710, between the San Pedro Bay ports and State Route 60. Early Action Projects include:<br>a) Port Terminus: Reconfiguration of SR 1 (Pacific Coast Highway) and Anaheim Interchange, and expansion of the open/green space at Cesar Chavez Park.<br>b) Mid Corridor Interchange: Reconfigurations Project for Firestone Blvd. Interchange and Atlantic/Bandini Interchange. | Conceptual Planning. |
| 83 | Edison Avenue Closure | Close a short section of Edison Avenue between Ninth and Pier B streets to improve public safety and traffic by rerouting cars and trucks away from three rail lines that cross Edison at Pier B Street. | Initial Study and Negative Declaration released June 2007. |
| | | ***City of Long Beach Projects*** | |
| 84 | Renaissance Hotel Project, City of Long Beach | Development of a 374-room hotel on the southeast corner of Ocean Boulevard and the Promenade. | Approved project. Construction complete. |

## Table 4-1. Related and Cumulative Projects (continued)

| No. in Figure 4-1 | Project Title and Location | Project Description | Project Status |
|---|---|---|---|
| | | ***City of Long Beach Projects (continued)*** | |
| 85 | D'Orsay Hotel Project, City of Long Beach | Development of a hotel. The D'Orsay Project is a 162-room boutique style hotel on the northwest corner of Broadway and the Promenade. | Approved project. Construction underway. Anticipated completion in Fall 2008. |
| 86 | City Place Development, City of Long Beach | Development of commercial and residential space. The former Long Beach Plaza Mall, downtown between 3rd and 6th Streets and between Long Beach Boulevard and Pacific Avenue, is now under construction. The approved project will redevelop the former mall area and two blocks of vacant land east of Long Beach Boulevard with approximately 450,000 square feet of commercial space and up to 200 residential units. The EIR prepared for this project identified significant air quality impacts. | Construction complete. Completed in 2005. |
| 87 | The Pike at Rainbow Harbor, City of Long Beach | Commercial use development. This project site is south of Ocean Boulevard on the site of the former Pike Amusement Park between Pine and Magnolia Avenues in Long Beach. This approved project includes approximately 770 residential units, a 500-room hotel, and 25,000 square ft of commercial space. The EIR prepared for this project identified significant air quality, cultural resources, noise, public service, and transportation impacts. | Approved project. Construction complete. |
| 88 | Queensway Bay Master Plan, City of Long Beach | Construction of Long Beach Aquarium, new urban harbor, office building, and entertainment complex. This project, designed to create a major waterfront attraction in downtown Long Beach, includes a recreational harbor, 150,000-square-foot aquarium, 125,000-square-foot entertainment complex, 59,000 square feet of restaurant/retail space, an 800-room hotel, 95,000 square feet of commercial office space, and 487 boat slips in and around Queensway Bay. The recreational harbor and aquarium have been completed. The EIR certified for this project identified significant transportation impacts. | Approved project. Construction complete. |

*Note:* 1. Construction date for Port projects based on an assumption that the project would be approved by the LAHD.

San Gabriel & Lower Los Angeles
**RIVERS AND MOUNTAINS CONSERVANCY**

CALIFORNIA RESOURCES AGENCY

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LA County Public Works

Executive Officer
Belinda Faustinos

November 5, 2008

Steven W. Highter, P.E.
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road2
Whittier, CA 90601

Re: Clearwater Program Master Facilities Plan NOP

Dear Mr. Highter,

The San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC) is grateful for the opportunity to provide comments on the Sanitation Districts' Clearwater Program Master Facilities Plan Notice of Preparation (NOP) of an Environmental Impact Report. The mission of the RMC, an independent agency within the Resources Agency of the State of California, is to preserve urban open space and habitats in order to provide for low-impact recreation and educational uses, wildlife and habitat restoration and protection, and watershed improvements within our jurisdiction. Our jurisdictional area overlaps roughly half of the Joint Outfall System's service area, and includes the service areas of the Pomona, San Jose Creek, Whittier Narrows, and Long Beach Water Reclamation Plants.

The goals of the RMC are described in *Common Ground*, the Conservancy's Watershed and Open Space Plan, which may be found at http://www.rmc.ca.gov/plan/intro.html). The Plan presents a simple vision for the future: ***restore balance between natural and human systems in the watersheds***. The centerpiece of the Plan is a series of Guiding Principles that cities, federal, state and local agencies, communities, groups and individuals can use to plan preservation, restoration and establishment of future open space, water resources, and habitat projects. More than 60 cities in Los Angeles County have adopted this document.

The University of Southern California's Center for Sustainable Cities and GIS Research Laboratory has created plans and practical planning tools for open space which you should add to your set of plans and tools for the EIR. The Center published the "The Green Visions Plan for 21st Century Southern California" which offers a

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guide to habitat conservation, watershed health and recreational open space for the Los Angeles metropolitan region. The Center has published a number of related reports which can be found at http://www.greenvisionsplan.net. In addition, the Center has created a set of online GIS planning tools that allow users to access geographic information about habitat, watershed, and recreational assets and opportunities. These resources are online at http://gv-server.usc.edu/GVWebTools_public_v2/imaps_test/app.asp. For more information about The Green Visions Plan and the planning tools, contact Dr. Jennifer Wolch, Director, Center for Sustainable Cities, at the USC Department of Geography; 413 Kaprelian Hall, Los Angeles, CA 90089 (wolch@usc.edu; 213-740-0521).

The RMC has reviewed the NOP for the Clearwater Program Master Facilities Plan and has the following comments primarily related to Water Reclamation Plant (WRP) effluent management:

1. The assumption that wastewater flows will increase proportionately with an increasing population should be reviewed carefully, in light of the potential for reduced imported water supplies available to the region, greater potable water use reductions through efficiency measures, and possible effects of an economic recession and distressed housing market on population trends.

2. In evaluating the need for added capacity in the wastewater collection system, the EIR should address the potential for wastewater flow reductions from an aggressive water recycling and potable water efficiency (conservation) program. Elements that could be considered in such a program include:
    - financial incentives offered by the Districts for potable water efficiency measures that would reduce wastewater flows;
    - partnerships with other public agencies targeting residential, commercial, and industrial sectors;
    - construction of new storage facilities and, where appropriate, new recycled water pipelines, for addressing seasonal fluctuations in recycled water demands; and
    - strategic placement of small, localized "package" treatment plants to relieve treatment and collection system capacity pressures, and to provide recycled water closer to opportunities for groundwater recharge, irrigation, and other typical uses.

    Although some treated wastewater currently gets discharged to inland water bodies such as the San Gabriel River, an enhanced program to facilitate and promote the reuse of this water should be explored. Where possible, the analysis should compare the environmental (and separately, financial) impacts and benefits of expanded reuse versus the proposed expansion of the ocean outfall system.

3. In general, the areas served by the Districts' Water Reclamation Plants upstream of the Joint Outfall System suffer from insufficient and limited opportunities for new open space, habitat for terrestrial, avian, and aquatic species, and low-impact recreation facilities such as trails and natural parks. The EIR should ensure that the MFP and specific projects to the greatest extent possible avoid negative on these opportunities –

or to the extent impacts are impossible to avoid, they should be fully mitigated and offset with increased opportunities and facilities within the impacted area.

Thank you for your consideration of these comments. If you have any questions, please contact the RMC's Director of Water Policy, Tim Worley at 626-815-1019, extension 107, or at tworley@rmc.ca.gov.

Sincerely,

Belinda V. Faustinos
Executive Officer

**PALISADES RESIDENCE ASSOCIATION**
P.O. BOX 5281
SAN PEDRO, CA 90733-5281

Dear Clearwater Program,

This letter is on the behalf of the Palisades Residence Association which encompasses the area north of Paseo del Mar, west of Gaffey Street, east of Western Avenue and south of 25th street. It also includes the Pacific Heights area. Due to the huge impact on our community in every aspect considered under the California Environmental Quality Act over a long period of time which will not benefit our community in any respect, we advocate locating the construction of the shaft site at Terminal Island. Our comments on the proposed Clearwater Program are listed below.

We begin by commenting on the Notice of Preparation of an Environmental Impact Report (NOP) in its totality. Essentially, it simply indicated what it was going to study without flushing out any details which would help the community understand the enormous undertaking of this project and the true impact it will have. The NOP only stated what is required of them pursuant to the California Environmental Quality Act, again failing to give the barest of details so that the community can begin to digest the nature of such a project. It is hard to operate in this arena of ambiguity and lack of information. Please thoroughly list the details of construction: number of trucks per day, route they will take, anticipated load they will have, types of construction equipment, their height/weight, number of employees who will work on site, etc. Please detail the anticipated business impact of the construction on local businesses. Please take into consideration the numerous schools that are near each proposed site, except for Terminal Island.

5.2: Aesthetics: without a complete description of the project, both in its construction phase and permanent phase, it is hard to make any comments. Please detail the exact nature of the construction and operation of the permanent MFP components. Please define "relatively short term" when determining impacts occurring during construction. Please do not limit "viewsheds" simply to ocean views; include the point of view of looking up into the hills. Please include how it is determined what are "important visual resources" and "likely viewer reaction to the changes." Please indicate your source for "existing visual resource policies."

5.4: Air Quality: please analyze the potential air quality issues involving both construction and operational air emissions with consideration to MATES II and III Studies. We also request that the document titled "Health Effects of Diesel Exhaust Air Pollution" and the medical literature reference therein, prepared by the Port of Los Angeles Community Advisory Committees Air Quality Subcommittee, be incorporated into your analysis. We also request that the cumulative effect of this construction is analyzed in relation to all of the proposed PORT projects: Trepac expansion, cruise ship

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expansion are most notable. Further, please analyze the effect of construction on the success of the Clean Trucks Program within the Port of Los Angeles. It has been suggested that there will 150 truck trips a day for 8 years. Please detail the types of trucks to be used and their compliance with the Clean Truck Program. Please utilize data from the air toxic sampling sites located at Port of Los Angeles and Port of Long Beach. Please discuss the "Diesel Death Zone" which surrounds the Ports in relation to your proposed project. We request that Section 3.2 "Air Quality and Meteorology" from the July 2008 DSEIS/SEIR for the POLA Channel Deepening Project be made a part of the record for the DEIR. Please identify the change in air quality due to dust from construction.

5.5: Biological Resources: Please detail the effect of the construction and permanent MFP components on wildlife habitat and natural movement corridors. We believe that the Cabrillo Beach area is a wetland area. Heal the Bay has given Cabrillo Beach water quality an "F" for its horrible state. White Point Nature Reserve is in the process of replanting and refurbishing its vegetation with indigenous species. Please consider that this area is prized for its almost rural like nature with few street lights and little ambient lighting. This is also true of noise: the area is sought out for its peace and serenity at all times of the day.

5.6: Cultural Resources: Please consider the impact on all cultural resources, including but not limited to: Peck Park: tennis courts, swimming pool, picnic areas, gymnasium, baseball fields, community meeting center; White Point: hiking trails, wildlife, future educational facility discussing natural habitat; Point Fermin Park: Shakespeare by the Sea, Sunday music festivals, Taste of San Pedro, family picnics, kite flying, Point Fermin Lighthouse (a historical treasure); Friendship Park: soccer fields, baseball fields, hiking, picnicking, nature museum, gymnasium; Cabrillo Beach: bathhouse, Cabrillo Beach museum, seasonal celebrations, family picnics, surfing, swimming, windsurfing, fishing, kayaking; Averill Park: frequent place to have an outdoor wedding, swans, mini waterfalls, ducks, geese, beautiful park; Field of Dreams: beautiful soccer fields with accessible parking; Angels Gate Park: Marine Mammal Center, Oiled Bird Center, the Catholic Church on site, Fort MacArthur Historical Museum, Angels Gate cultural Center, Korean Bell, and the hostel, with neighboring PFOEC and possibly the future South Region High School #15. The impact is not only on those living in San Pedro. These facilities are sought after by all of Los Angeles County.

5.9: Hydrology, Water Quality and Public Health: We are aware of the malfunction of current solid waste treatment facilities which caused raw sewage to empty into the ocean. Please describe how and why these systems will operate more efficiently. Describe how these catastrophes will be prevented. This is particularly important in relation to inner Cabrillo Beach which suffers from the lowest water quality rating in the county. Please consider the significant wind speed in this area often referred to as "Hurricane Lane". Please use measurements of wind speed from the Marine Exchange located on the Angel's Gate Property. Please look to year long wind speeds so as to incorporate those days that have had wind speeds up to 40 mph such as last week.

5.10: Land Use and Planning: Please incorporate the proposed updated San Pedro Master Plan currently in discussion. Also please discuss in relation to proposed projects: Port expansion, Cruise Terminal, SRHS #15, and the Clean Trucks Program.

5.11: Marine Environment: see 5.10.

5.12: Noise and Vibrations: Please describe noise and vibrations from trucking operations, use of heavy construction equipment, pile driving activities and blasting, in detail. Please be aware of the geography of this area which causes sound to be carried much further than in other areas, particularly with the significant wind that occurs and also caused by the canyons.
5.15: Recreation: see Cultural Resources above. Please advise why an 8 year construction project is considered "short-term." Please consider the proposed updated San Pedro Master Plan for recreational needs which services not only San Pedro, but all of Los Angeles County.

5.16: Transportation and Traffic: Please discuss the impact of this project on the only three main roads in/out of San Pedro: Western (and the needed side roads to get to the freeways), Gaffey and Pacific. Gaffey and Western are severely congested at this point and provide the only access to the freeways. Further, please discuss the cumulative impact of this project in light of other proposed projects: the Port expansion, Ponte Vista project, cruise terminal, SRHS#15, etc. A full and comprehensive list of proposed projects can be found in the DEIR's of these projects. What types of malfunctions can be anticipated whether common or remote; how will they be dealt with and how will this affect our only main thoroughfares out of this city?

5.18: Cumulative and Growth-Inducing Impacts: Please discuss thoroughly, particularly in light of proposed Port expansion projects, cruise terminal, SRHS #15, and the Ponte Vista project.

We further request that you consider in the Alternatives section reversing the direction of the flow: rather than dumping it into the ocean, direct this pure and clean water to areas where it can be reused; even back to the communities who created the waste in the first place.

We further request that our organization be included in any further notifications or distribution of information.

PALISADES RESIDENCE ASSOCIATION
pra@sanpedropalisades.org

NOP.clearwater.PRA

## Sanitation Districts of Los Angeles County
### CLEARWATER PROGRAM
### Master Facilities Plan

**Comment Form: Notice of Preparation of an Environmental Impact Report and Notice of Intent to Prepare an Environmental Impact Statement**

(This form is provided as a convenience and is not required. Your comments may be submitted at any time during the public comment period for the Notice of Preparation and Notice of Intent, which ends on November 14, 2008.)

Name: PAT ROME

Company/Organization (optional): CONCERNED RESIDENT

Mailing Address: 25327 PINE CREEK LANE

City: WILMINGTON State: CA Zip: 90744

Email: PJWROME@YAHOO.COM

I would like the following potential environmental impact(s) to be addressed by the Environmental Impact Report and Environmental Impact Statement for the Clearwater Program Master Facilities Plan:

HOW DOES NEW CONSTRUCTION PERMITS RELATE TO WATER/SANITATION CONCERNS? WHY IS ONLY 40% OF RECLAIMED WATER USED?

☒ I would like to be placed on the mailing list to receive the Clearwater Program Newsletter and any future public notices regarding the project.

You may hand in this form during the scoping meeting or mail it to:

Steven W. Highter
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California 90601

*or*

Kenneth Wong
Project Manager, Regulatory Branch
U.S. Army Corps of Engineers, L.A. District
P.O. Box 532711
Los Angeles, California 90053-2325

For information, please call 1-877-300-WATER (9283)

## Sanitation Districts of Los Angeles County
## CLEARWATER PROGRAM
## Master Facilities Plan

### Comment Form for Notice of Preparation of an Environmental Impact Report

(This form is provided as a convenience and is not required. Your comments may be submitted at any time during the public comment period for the Notice of Preparation, which ends on November 14, 2008.)

Name: JoAnn Wysocki

Company/Organization (optional): 1006 King Avenue

Mailing Address: Wilmington

City: Wilmington State: CA Zip: 90744

Email:

I would like the following potential environmental impact(s) to be addressed by the Environmental Impact Report for the Clearwater Program Master Facilities Plan:

Alternate Route
Sanitation – to Lomita Blvd
to Vermont Avenue
Through 5 points
After that – What?
Gaffey-Weskrn – Outfall
WANT TO HEAR WHAT ARMY CORP OF ENGINEERS HAVE TO SAY TOMORROW NIGHT.

☐ I would like to be placed on the mailing list to receive the Clearwater Program Newsletter and any future public notices regarding the project.

Hand form in during the scoping meeting or mail to:

Steven W. Highter, P.E.
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California 90601

For information, please call 1-877-300-WATER (9283)

NOV 24 2008 AM11:23 DOC # Highter S

## Sanitation Districts of Los Angeles County
## CLEARWATER PROGRAM
## Master Facilities Plan

**Comment Form: Notice of Preparation of an Environmental Impact Report and Notice of Intent to Prepare an Environmental Impact Statement**

(This form is provided as a convenience and is not required. Your comments may be submitted at any time during the public comment period for the Notice of Preparation and Notice of Intent, which ends on November 14, 2008.)

11/6/08

Name: Jo Ann Wysocki

Company/Organization (optional): Resident

Mailing Address: 1006 King Avenue.

City: Wilmington State: CA Zip: 90744

Email:

I would like the following potential environmental impact(s) to be addressed by the Environmental Impact Report and Environmental Impact Statement for the Clearwater Program Master Facilities Plan:

1. Is the Army Corp of Engineers primary concern: a) land environment; b) water environment; c) both?
2. Does the Los Angeles City Quimby fund apply to this project?
3. Proposed route: Sanitation Plant, West on Lomita Blvd; south on Vermont ave. to 5 Points; to Gaffey; east on Channel; into the Harbor.
4. Truck traffic from soil removal. 5.8 5.16

☐ I would like to be placed on the mailing list to receive the Clearwater Program Newsletter and any future public notices regarding the project.

You may hand in this form during the scoping meeting or mail it to:

Steven W. Highter
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California 90601

*or*

Kenneth Wong
Project Manager, Regulatory Branch
U.S. Army Corps of Engineers, L.A. District
P.O. Box 532711
Los Angeles, California 90053-2325

For information, please call 1-877-300-WATER (9283)

NOV 24 2008 AM 11:24 DOC # Wilma S

November 12, 2008

Chuck Boehmke
Sanitation Districts of Los Angeles County

Notice of Preparation of an Environmental Impact Report Clearwater Program

I U.S. Army Corp of Engineers
Is the U.S. Army Corp of Engineers primary concern in this matter
a) Land environment
b) Ocean - Harbor environment
c) Both ? Answered at San Pedro 11/6/08

II Figure 2
Discuss possible expansion of all existing joint outfall system facilities because of the expanded capabilities of this project.

III Need for Project Page 4
What is the total cost of this project? What is the potential for cost-over-runs on this project? Where does the money for this project come from?

IV Program - Level Components Page 4
What is the % involved of each

of the five individual components?

4.1.1. Wastewater Conveyance
What is the % of wastewater flows increase in relationship to the population increase?

What is the % of wastewater increase from industrial dischargers to residential dischargers?

Since the San Pedro - Wilmington residential communities do not discharge to this system, what industrial users discharge to this system and are in the City of Los Angeles?

What is the projected flow by year? PAGE 5.

4.1.2. Solids Processing Page 5
Does such a centralized solids processing facility exist

other then ~~the~~ JWPCP?

4.1.4 WRP Effluent page 6

Where would there be a water body for inland discharge? This report uses the San Gabriel River, Jose Creek, Coyote Creek rather than bodies of water close to this project. Pages 6, 20, 21

5.10 Land Use

what Carson City and Los Angeles City Zoning and relevant land uses apply to digging 150-200 feet under the earth? The Port of Los Angeles has its own master plan.

S haft site locations need to be better identified ~~then~~, Figures 4 and 5. A need for direct addresses.

4.1.5. JWPCP

what % of salt makes JWPCP

"less desirable for reuse?" PAGE 6

How temporary is discharge to points other than the existing tunnel and outfall? PAGE 7

What other beneficial reuses of the effluent flow are possible? PAGE 7. People complain that only 40% of the effluent is reusable; but they do not give examples of possible reuse. What is the Sanitation system looking at for more reuse of effluent?

4.2 Project-Level Components Page 7

It is clear the final report will be in favor of a new tunnel and ocean outfall. The problem arises at 4.2.2.

4.2.2 Tunnel Access/Construction Page 7

The 3 Wilmington streets, that

new north-south are essentially residential, small businesses close to or located on schools, churches and Dana Strand Housing. Also there is the Port of Los Angeles plan for the first block of Wilmington Blvd north of John S. Gibson.

A consensus from community meetings may be to take the pipeline route into the Harbor, but the problem is how to get there to the Harbor.

* I propose a route designed to avoid residential in Wilmington and San Pedro.

JWPCP Plant on Carson
East on Lomita Blvd.
South on Vermont Avenue
Five Points
South on Gaffey Street
BUSINESS PROTECTS THE RESIDENTIAL
East on Channel Street
Into the Harbor

*

The Sanitation District needs to hold meaningful discussions with the Port of Los Angeles on these three proposed routes. Dates and those contacted at these meetings need to be clearly identified.

I recommend avoiding Frigate Avenue as a proposed route. The Avenue is too narrow especially south of the JWPCP plant. I invited those attending the Nov. 5 and Nov. 6 hearings to walk the Avenue to see for themselves.

Figure 3 Page 9 Project Study Area

Cannot be easily read without a magnifying glass.

Figure 5 Page 11 Potential Diffuser Locations

Explain why no construction can take place in the Continental Shelf. San Pedro meeting 11/6/08

5.2 Aesthetics Issues Page 12

What Los Angeles City permits must be obtained for construction above and below ground? Discuss light and glare. Does this project interfer with the Port of Los Angeles plan or plans for the first block west of John S. Gibson Blvd?

Approach 1st paragraph, 5th line

Define in simple language VIVIDNESS, INTACTNESS, and UNITY.

5.4 Air Quality Issues Page 14

What is the estimated number of employees and their methods of transportation to and from any construction site/sites. Construction sites do not remain static.

Discuss release of volatile organic compounds from plant operations.

What is the increase of JWPCP "solids processing" and biosolids management"? Is it due to the completion of this project and the growth anticipated by 2050?

Approach page 14

Estimate type, number and emission of construction equipment. Where will the storage of the construction equipment be?

Will air quality samplings be based on monitoring or estimations? How old will the samplings be?.

Does the SCAQMD hold a hearing on this project?

5.5. Biological Resources Issues Page 14

Effects of constraction on the Harbor waters of the Los Angeles Port.

Effects of conatruction and effluent on birds at the Port of Los Angeles, particularly the Least Tern.

Approach Page 15

Please use Port of Los Angeles sources also.

Again proposed project is not yet well thought out as 3 proposed routes in Wilmington go through schools, churches, small business areas, residential and Dana Strand and multi-unit areas). Page 15.

5.6 Cultural Resources

Discuss earthquake faults along 3 proposed land routes and tsunami potential in the Harbor waters and on the land. 5.7 page 17.

Approach Use Port of Los Angeles information. Page 16.

5.7 Geology and Soils p. 17 Issues

Discuss vibration. Be prepare to give expert geological studies to propose 3 area land routes in Wilmington.

5.8 Hazards Page 18 Issues

Discuss ground water potential in 3 proposed land sites in Wilmington.

What happens to the excavated tunnel material including the soil? Number of trucks, frequency per day trips, testing of excavated soil. Page 18.

Approach p. 18 Please explore in detail any pipelines this project will uncover in excavation work.

5.9. Hydrology P. 19 Issues

What is/are seiches?

Is there any impact/impacts on the Machado Lake, Wilmington Drain or Dominguez channel from this project?

Does the project anticipate finding any contaminated ground water in this project's excavation work, particularly on land?

Approach Please use available Los Angeles City Resources to analyze impacts of MTP to hydrology, water quality and public health.

Page 20 Detail effects of drainage patterns, groundwater levels and flow patterns to local water resources in Carson and Wilmington from this project.

5.10 Land Use Page 20
What, if any, land use hearings by the city of Carson and the City of Los Angeles are required by this project?

5.11 Marine Environment Issues Page 21
Include study of Los Angeles Harbor
- Water quality - silt
- Essential fish habitat EFH
- Interference with local bottom currents
- Bottom habitat and marine environment
- Navigation to/from Port of Los Angeles
- Accidential spills of fuel/hazardous material

Approach Page 21
Is the Palos Verdes Shelf Superfund Site/DDT, contaminated sediment, relevant to this study?

Page 22 Define "benthic" second line.

5.12 Noise Page 22

Describe noise and vibration from construction activity particularly pile driving activities.

Approach: Use Los Angeles City studies on noise particularly in residential areas: Wilmington if available.

What is a sensitive receptor when you can hear the trains all over Wilmington? p. 23

5.13 Population Issues P. 23

The residential population of 72 cities may benefit from this project, but what industries in Wilmington and San Pedro will empty their waste/wastes into this project?

What is the anticipated additional jobs to be added to construction and long term operations of new facilities?

The impacts, particularly to Wilmington, a "minority and disadvantaged community" are noted.

5.14 Public Services page 24

What contacts have been made with police, fire and hazmat services

in Los Angeles City (Harbor Division) and Los Angeles County Sheriff (Carson Station) concerning public safety related to this construction project?

5.15 Recreation Page 25

How does this project affect any Port of Los Angeles Plans for the first blocks north of John S. Gibson Blvd. on Wilmington Blvd?

approach Please consult Los Angeles Port Plans on recreation, rail and truck transportation for information on the Wilmington Blvd and Figueroa routes in particular. Page 25

5.16 Transportation and Traffic p. 26 p. 27

Refer to 5.4 page 7
5.8 pages 9 and 10

Is a traffic study planned for this project. If yes, who will do it? There are too many unknowns at present 11/12/08.

Please refer to any Los Angeles Port plans for John S. Gibson.

1) Where will construction workers park? Construction areas move.

2) Number of construction workers and how they get to work.

3) Number of trucks, frequency of trips, route to remove soil from construction.
4) Impact on traffic particularly in Wilmington.
5) Possible impact/impacts at Figueroa Street and Pacific Coast Highway.

Page 29 Approach
2009-2050: only 41 years away. Will the Sanitation District have to come back for additional projects to accomodate growth in its mandated area?

OTHER
1) Need figures showing relationship to Carson and Wilmington and San Pedro communities to proposed construction. Figures 1, 2, 3, 4, 5 are not sufficient or clearly labeled.

2) The San Pedro meeting, Nov. 6, gave 4-8 years as the length of time for truck traffic to remove the excavated soil. Will an independent contractor be used?

3) Does the Los Angeles City Rumby fund apply to the project to benefit Wilmington or San Pedro?

4) Use charts to show dates of project from first notice of project to date of completion, and phases of construction.

5) Persons and qualification of those working on this report.

That my analysis may be of some assistance in final reports.

JoAnn Wysocki
1006 King Avenue
Wilmington 90744

(310) 834-5658

cc: file copy
15th District Council Office

**Attachment 4**

# ORAL COMMENTS ON THE NOP/NOI

# Clearwater Program
# Whittier Scoping Meeting
# 10/30/08 1:30 PM

**Ubiqus/Nation-Wide Reporting & Convention Coverage**
**2222 Martin Street, Suite 212 – Irvine, CA 92612**
**Phone: 949-477-4972 ◆ Fax: 949-553-1302**

# Whittier Scoping Meeting

[START Whittier Scoping Meeting.MP3]

INTERVIEWER: Thanks, Jeff. I don't want to put you on the spot, but you're our only appreciated invited guest. At this point, what we'd like is just your name and affiliation and we'll break it in two segments. You know if there are any questions you have regarding some aspect of the NOP in terms of clarification, we'll take those first. And then if you have comments, we'll take those after.

MR. CHINO CONSUNJI: My name is Chino Consunji [phonetic]. I'm with the city of Norwalk. I'm the city engineer, so my main concern would be on the impacts to the city of Norwalk. I've read in your notice of preparation that this may be done in different phases, and part of it is probably upsizing some lines or installing parallel lines to your trunk sewer lines. And my question is, or maybe some clarification if some of those alignments have been identified as far as maybe the city of Norwalk, if you pretty much know where you may have to upsize those lines?

INTERVIEWER: At this point in the meeting, we wanted to get ideas, I mean really in terms of what environment impacts we should really--I mean focusing on community input. I think we'll take that comment, but I don't know, are we at the point to answer that, Chuck?

CHUCK: I can answer that. We're still evaluating that. We're still working on the projections of the wastewater flow out to the year 2050. And once we have that finished, then we can look at which sewer lines the flow will be running in any relief needs into the future. But we haven't gotten that far yet.

MR. CONSUNJI: And part of that also, and the reason why I brought that up, you mentioned that construction will be somewhere around 2012.

CHUCK: That's for the tunnel and ocean outfall portion of the project.

MR. CONSUNJI: Okay, not necessarily the other parts upstream?

CHUCK: Right.

MR. CONSUNJI: Okay. I just wanted to bring to your attention that the I-5 will be widened sometime around that period, 2011, 2015. I think it's like a four or five-year project. So depending on where you upsize your lines, it may affect traffic and all that would have traffic impacts to the city of Norwalk.

Also, I think the high speed rail; they have another project that's proposed to go through the city of Norwalk. And it would be right around that time too. So I guess that would be considered in your traffic impact part of the environmental.

INTERVIEWER: I guess I failed to also mention that if you could also--we have your oral comment but we'd appreciate it if you could submit something in writing to ensure that we really get your comments and your concerns as accurately as possible.

MR. CONSUNJI: I can put something and maybe just mail that back to you.

INTERVIEWER: Or email it.

MALE VOICE: Whatever is easiest.

MR. CONSUNJI: And again, I'd just like to point out those two big projects that will probably--you know should be considered in the environmental traffic impact.

INTERVIEWER: And we appreciate that. Do you know if the I-5 widening plans are already available? Are they set or are they working on it?

MR. CONSUNJI: Right now the Carmenita portion, I think they're close to getting 100% PSE done. In fact, they're saying that construction will be late 2010. And that alone I think is like a three-year project. But simultaneous to that one will be the widening of I-5 between Carmenita and the 605. So that's a bigger project that goes through Norwalk, Santa Fe Springs, Downey and Commerce I think. And that would be another four or five years. It's going to be a lot of work in that area at that time.

MALE VOICE: That's good to know. We appreciate the heads-up.

INTERVIEWER: Thank you and we really appreciate it because it helps us do a better job with our facility and planning

process. Comment forms are available in the back of the room. And as Joe mentioned earlier, the comment period will remain open until November 14th. And then a draft facility plan and a draft environmental document should be completed and released at the end of 2009. And in between that, there will be many other opportunities to provide input.

We'll have additional group presentations to the community, newsletters will continue to be produced and mailed out. And the Clearwater website will be continually updated with new information. I think Joe might have mentioned you can provide input at any time through the website or the phone number at the website. Just look for the draft facility plan and the draft environmental document later next year and thank you for coming here.

MR. CONSUNJI: Just one more.

INTERVIEWER: Okay, I'm sorry.

MR. CONSUNJI: You mentioned that there would be one environmental document for the program.

INTERVIEWER: It'll be a joint document, environment impact statement, which is the NEPA [phonetic] equivalent and is combined with the environmental impact report, which is the CEQA [phonetic] state requirement in terms of environmental documentation.

MR. CONSUNJI: When you get to the point when you're doing your final design and you identify some of the sewer lines to be upsized, let's just say in the city of Norwalk, would that be a separate environmental?

INTERVIEWER: I would almost say that it's premature to answer those kinds of questions. Because you guys are working through the kind of machinations in terms of what the recommended project will look like. Because they're looking at a universe of alternatives. And they have to decide on a recommended project. And out of that you could answer that, or correct me if I'm wrong.

MALE VOICE: You know, I think that there's going to be some indication within the facilities plan as to what lines might need to be relieved between now and 2050. We're looking that though on more of a programmatic level, very big picture. And once we get closer to the construction of such relief

projects we're going to have to do a more detailed environmental evaluation. So there'll be some sort of subsequent CEQA documentation.

And just to help you understand, we're not anticipating having to--we're not seeing a whole lot growth in the area and we're not anticipating to have to relieve any of our treatment plants until maybe the year 2035-ish. So I think those are long-term projects. But we'll make our best effort to identify what they may be within the facilities plan.

MR. CONSUNJI: Thank you.

INTERVIEWER: All right. I think that closes this scoping meeting.

MALE VOICE: Thanks for coming.

INTERVIEWER: We really appreciate it.

[END Whittier Scoping Meeting.MP3]

# Clearwater Program
# Wilmington Scoping Meeting
# 11/05/08 6:30 PM

**Ubiqus/Nation-Wide Reporting & Convention Coverage**
**2222 Martin Street, Suite 212 – Irvine, CA 92612**
**Phone: 949-477-4972 ◆ Fax: 949-553-1302**

# Wilmington Scoping Meeting

[START Wilmington Scoping Meeting.MP3]

MALE VOICE: Just for the record, if you could just give us your name and indicate any affiliation that you might have.

MS. JOANN WYCOWSKI: Joann Wycowski [phonetic], 1016 Avenue, which is right off of Wilmington Boulevard, two blocks from Frigate [phonetic] and two blocks from - - .

And I am left with an ungodly feeling that Wilmington Boulevard is going to be the route, because I'm looking at the map and I read what you said about straight lines and turns and into the Port of Los Angeles. I agree, put it into the Port of Los Angeles. But in one the previous letters that I have already submitted, I suggested that the tunnel come out of the - - sanitation district, go west on Lomita [phonetic] Boulevard to Vermont, turn and go south on Vermont to Five Points. You're missing the residential areas completely.

If you go through one of those three routes in Wilmington it's small businesses, schools, churches and a lot of homes. And I know that report says 200 feet, but I'm talking to the people who live in the - - Pass area and they say the residential area will still feel from the vibration of the construction. That is my great concern.

Now I do have one really bad comment of preparation, it's pages 20 and 21. You keep talking about Coyote Creek and Jose Creek and the San Gabriel River in several places. San Gabriel River on page 21. This concerns the South Bay area, why bring that geographical location into this report. I hope it can be eliminated for the final report.

You've given the schedule and I like that. And I would strongly suggest that in the final EIR you print that page so that everybody sees, okay, we were at this point and we had that opportunity to comment or go to a meeting. The company that you've hired, Jones and Stokes, I presume that the Army Corps of Engineer has signed off on that too.

2020, apparently that's when your construction will be completed, because that's 11 years from now. And remember, Wilmington is a part of the city of Los Angeles. The residential area does not use this but you are asking if you

choose one of those three routes for us to bear the burden in any problems in construction. And I think you're going to have to eliminate Frigate. Frigate is too narrow a street. Come down it sometime and see just exactly how narrow it is south of the plant.

I'd like to know how much contact you've had with the Port of Los Angeles since they're going to be asked for those outfalls. And the diffuser areas, I think that's a technical name for the outfall.

Now, I'm curious why the Continental Shelf cannot be used. It is a federal regulation? Is it the rate of construction, it's too dangerous to construct at such a depth?

I'd like to know the cost. I think it's going to be born by the cities that feed into this system. That's 3.0 page 4. And on 4.1, you had the individual components of 5 areas. I'd like to know the percentage of increase from now to say 2020 and 2050 to justify the construction and to include these five individual components.

On page 6, 4.1.4, it talks about inland body discharge. What inland body discharge? Is this project going to have any effect on Machato [phonetic] Lake or the Wilmington green.

Now, my route gets it to San Pedro. And I remember when you held the first hearing in San Pedro, a lady immediately wrote a letter to the Daily Brief and she was alerting all of San Pedro to what was coming, which means she doesn't want it coming through McGuffey [phonetic]or Pacific or Western, all of which are heavy residential streets, particularly Western in San Pedro.

The tunnel shaft sites, could you be a little bit more specific that just a little yellow dot, you know give an address. I think the first one is at the sanitation plant. And again, how much contact have you had with the Port of Los Angeles? Okay, I have read this and I'm getting ready to comment. I misunderstood. I thought tonight was on Lomita Boulevard. But I will be commenting. Most of this will come in that and there'll be some other things that I think are more minor. Thank you very much. But my concern is take a look at an alternative other than Wilmington Boulevard, Frigate which I think is too narrow and Figarola.

What happens after it leaves Wilmington I don't know, but if we're going to have this project, let everyone share in this project that the residential area really does not benefit from. Yes, I understand our industry does dump into this system, but the residential area does not. And there has been some question raise about what Terminal Island, if it will be sharing its waste with this new system. Could you address that? Thank you, I will be commenting very fast on this now.

MALE VOICE: Thank you Joanna, you do have until November 14th to get the written comments to us. Good evening to the gentleman that just walked in. Did you wish to give us any comments this evening?

MR. ARTHUR HERNANDEZ: Yes.

MALE VOICE: If you could give us, when you step up the microphone, give us your name and any affiliation.

MR. ARTHUR HERNANDEZ: My name is Arthur Hernandez [phonetic]. I live at 1348 Hyatt Avenue. I represent the Wilmington Property Owners of Wilmington. I'm president and founder of that organization. Also, I'm president and founder of the Wilmington Senior Council of Wilmington. I'm the founder of the Allegra Club of Wilmington. I represent the Wilmington Neighborhood Council and I'm a Wilmington Neighborhood Council representative to the Port Advisory.

I just came from a meeting, the air quality meeting, and we made a lot of recommendations there with all the members and illustrious members. And today we just finished up but I thought I'd come down here and give some input on the processing for the sanitation department.

I know it's a big problem, it's going to be a problem in the future. And I know the city has provided money. I think at one time for clean water and the port, the east basin of Wilmington, and that, I don't know if there's any--there's not any development on that so far. I'm on the board with Mrs. Eppington [phonetic] to go forward with the filtration system on the Dominguez Channel and we hopefully think that that could come about maybe with proposals going the end of this year.

Along with that is the development of Anchorage Road and there is a need for a filtration system on the Dominguez

Channel. If the city can go forward with it, I think we had some EIRs and outreach on that, but somehow it died and now we have the sanitation department coming in and trying to put a pipeline I guess from Machato Lake forward or going down Gaffey [phonetic] or Western. I don't know which route they want to go. But the needs in the future are significant.

At one time there was recommendations to put a big pipeline through the west basin and taking it all the way over to Carillo [phonetic] Beach. And that was done but if they're going to spend $2 billion for the development of this, it's an idea, but to go through the west basin over and run it underground. I don't know how far out they want to go with this pipeline, but if it's a mile out there it's still a consideration. Whether you'd save money, I don't know. I don't have the statistical reports to save money right now. But I know that that they're going to require pipes and possibly two to three acres of land for the need of processing all this material.

It was mentioned that the bio-solids are going to be entered in that and there was going to be water reclamation and the wastewater would be a conveyance in treatment of solid processing. And that we need in this area, but how they're going to go about it I do not know. And whatever is recommended I would say that that would help this whole area and community. Whether economically we're going to save money, I don't think we're going to save money 'cause there's a lot of cost to it. But if they can solve it well then I'll be for it.

And this whole area needs to have a clean water program for our facility to go forward. Water is important to California, it always has been and the future needs of California are accumulative. If we don't do it now we're going to have to pay for it later. There's no remedy for this right now as far as I can see. In the future the taxpayers will be paying for it anyway 'cause it's a bond issue. We will still have to pay for it, so it's just a matter of time. And I thank you.

MALE VOICE: Thank you very much, Arthur. And again, you have until November 14th. We'd appreciate if you could pick up a comment form and send this written. We have recorded it, but just to make sure we get everything down correctly, we'd like to have it in writing as well.

With that I'd like to remind everybody that the draft facilities plan and the EIS/EIR should be available for public review towards the end of 2009. At that point we will have public hearings on that.

But there's going to be other chances. We will continue to hold meetings in the communities. There is the website. You can input by calling the number or going to the email address on our website. And all of that is welcome because we couldn’t - - without community citizens like yourself giving us input. And with that I'd like to thank you for coming this evening.

[END Wilmington Scoping Meeting.MP3]

CLEARWATER PROGRAM

SANITATION DISTRICTS OF LOS ANGELES COUNTY

CROWN PLAZA

SAN PEDRO, CALIFORNIA

NOVEMBER 6, 2008

6:00 P.M.

MR. SWENSON: Hi, everyone. My name is Dan Swenson. I'm with the U.S. Army Corps of Engineers and I'm acting chief of the Los Angeles Section with the Regulatory Division of the Army Corps of Engineers. It's my purpose in being here tonight, and the purpose of the meeting to start off the EIS process and we do that first by having a Notice of Intent which I will get into in a little bit, but we will also be having the scoping basically to get any information, comments from the public on the proposed project.

So we got people here from Sanitation Districts that will be speaking on the project that's being proposed. So I will let them get into the details on that. I'm here with the Army Corps and I have also got Ken Wong who is also with the Army Corps of Engineers right there, and so after we are all done speaking up here, if anybody has questions about the permitting process, feel free to either talk to myself or to Ken and hopefully we can answer those questions.

Just in brief, the contents of -- forgive me, I'm reading a little bit from these notes. The Corps will prepare a draft Environmental Impact Statement for the Sanitation District's proposed Clearwater Program. And then they will get into the details on that. We put out a Notice of Intent to the public of

that draft EIS, EIR and the Federal Register and that was done on October 6, 2008.

The purpose of this scoping meeting and us putting out that notice is, like I said, to solicit comments. So any comments that we receive from the public, you know, we fully consider those as part of our process. And we will be accepting those comments through November 21 of this month. So the main point there is feel free to submit your comments and we will be reviewing all comments that we get. We will consider them and they will become part of the record. So if anybody has questions about how that works, let me know.

A little bit about our permit programs. The Corps is responsible for regulating a variety of different activities. We regulate discharge of the fill under Section 404 of the Clean Water Act. We also regulate work in navigable waters in this area, generally the Pacific Ocean, Colorado River, so obviously we are talking about the Pacific Ocean. And that would be under section 10 of the Rivers and Harbors Act.

And finally we also regulate activities along with EPA under Section 103 of the Marine Protection Research and Sanctuaries Act and that generally involves discharging material at offshore disposal sites. And

that's also likely to be a component of this project.

Part of the proposed project in the Clearwater Program would be a new ocean outfall and so it is part of that. That would involve discharge in waters obviously that would involve work in navigable waters and likely would also involve taking material out to the two offshore disposal sites. So we would be involved in all three of those laws.

The reason that we decided to do a -- to prepare an Environmental Impact Statement, combined -- with an EIR is that we decided that the project, due to the nature of the project, had the possibility of having significant impacts on the environment. And in that case, under the Clean Water Act and the National Environmental Policy Act, NEPA, which some of you might have heard of, we are obligated to do an environmental study. So here we are.

Just a little bit about our decision-making process. I guess basically once we put out our draft EIS again we look for -- at this point in time we are kind of looking for a general comment, what we should we focus on. Are there any new or maybe issues that we didn't mention in our notice of intent that we should be looking at. So we are kind of looking for new information.

Once we put out our draft EIS at that time we also have a comment period for that with a public hearing, kind of repeat that, you know, looking for more detailed comments on the project, because when the EIS goes out it will be a lot more detailed information in that document. Once we get those and evaluate them, we will put out a final EIS and during that we go through our decision-making process.

Just a little bit about that process. There are three main components of our decision-making process, one is the 404(b)(1) guidelines of the Clean Water Act and as part of that we do an alternative analysis, look at different alternatives for achieving the project purpose.

We also do a public interest review. I think I'm missing a component here. We also basically as part of preparing those documents, the draft and final EIS, we are also complying with NEPA, the National Environment Policy Act. Basically what that's all about is disclosing all the information that is relevant to the project, so it's basically about getting that information out and sharing it with the public. So NEPA, 404(b)(1) guidelines and public interest review.

So, again, if people have questions about it, feel free to ask us afterwards. So once we have gone

through those processes and address any comments that we get, at that time we make a final permanent decision, and that's kind of our involvement in this Clearwater Program.

So just in conclusion, I guess I would say that right now at this scoping meeting, again, we are asking for public input, any information you think you might not have, please share that with us. Again, I want to emphasize that we do consider all the comments that we get. So with that, I'd like to introduce, I think, Mr. Don Avila of the Sanitation Districts and he will provide the Districts' opening remarks and introduce the Districts staff that will explain the Clearwater Program. Thank you.

MR. AVILA: Thank you. My name is Don Avila and I'm the information officer for the Sanitation Districts. First thing we are going to do is get out the really important stuff. If anybody needs to use the bathroom, it's outside that back door and straight across the hall. Plenty of water, coffee and tea on the table right outside.

I would like to welcome you to the scoping meeting for the Clearwater Program for the environmental impact statement and environmental impact report. Over the past two years, the Sanitation Districts have met

with many community and business leaders and organizations to discuss what the Clearwater Program is all about.

We have also formed four workshops in March of this year and at those workshops we addressed all aspects of the program. We sought public input on prioritizing program objectives, alternative screening and to look at potential sites for shafts and alignments for the possible tunnel and ocean outfall connecting our Joint Water Pollution Control Plant to the ocean that Dan spoke about.

Over the past two weeks we have held four additional scoping meetings to this one that were geared toward the environmental impacts of the Clearwater Program with relation to the California Environmental Quality Act also known as CEQA.

This is not a decision-making process this evening. This meeting will not result in a decision. We are here to receive your input, as Dan said, on the environmental impacts that will be used by both the Districts and the Corps as we address the environmental impacts of the Clearwater Program. The process will be ultimately result in a recommended project that will presented along with other alternatives for a draft facilities plan and a draft environmental impact

statement and impact report that we expect will be released to public review sometime late in 2009, the end of next year.

We have hired a consultant to do the EIS and EIR and that consultant is Jones and Stokes.

Now the format for tonight's meeting will start with a presentation by our staff and then we will open it up to receive comments from the public information seating on these environmental impacts and your concerns.

And I'd like to introduce two of our staff this evening. Chuck Boehmke is the head of our planning section and Joe Houghton is the senior engineer in our planning section. And Joe Houghton is the one that is going to give you the presentation this evening. And, Joe, I would like to turn the meeting over to you.

MR. HOUGHTON: Thank you, Don. As he said, I'm Joe Houghton, project engineer for the Sanitation Districts. And tonight I want to give you a brief overview for the Clearwater Program and the type of project that might be produced out of the Clearwater Program. I'm also going to talk about the environmental process and some of the environmental documents that will be produced from the Clearwater Program.

In the County of Los Angeles, there are two

major waste water systems. One is operated by the City of Los Angeles and you can see their service area in orange there. They have the Tillman, the Glendale, the Hyperion and the Terminal Island treatment plants.

The other is the Sanitation Districts of Los Angeles County. And our service area districts are those shown up on the screen with the green and the blue areas up there.

The Sanitation Districts function on a regional level and consist of 24 independent special districts. We provide the solid waste and waste water management needs for over 5.3 million people in Los Angeles County.

17 of the 24 districts in the greater Los Angeles area have joined together under agreement to provide a regional sewer system which we call the Joint Outfall System. So if we zoom in on the area in the greater Los Angeles area, you will see the Joint Outfall System here. The Joint Outfall System consists of 20 Joint Water Pollution Control Plant in Carson as well as six upstream water reclamation plants. The treatment plants are connected by a series of sewers which is over 1300 miles -- over 1300 miles of sewers in our system and these sewers convey over 450 million gallons of waste water each day.

From time to time the Sanitation Districts like to look at the system and find the needs of the system and we prepare facilities plans to meet those needs. The picture you see up here are covers from our last planning effort which was completed in 1995. We are in our current effort which we call the Clearwater Program. And under the Clearwater Program we are going to prepare a master facilities plan. And the facilities plan will guide the development of the Joint Outfall System for the next forty years.

We are going to look at major components for our system like the treatment plant, our conveyance systems. How we are going to manage the waste water, the treated waste water from both our joint plant in Carson as well as our upstream plants. We are going to look at biosolids management and solids processing.

So one of the first objectives that we have seen early in the Clearwater Program is that we have a growing population, so we need to meet the needs of a growing population. The Southern California Association of Government projects that the population in the joint outfall service area will increase from 5.1 to 6.3 million over the next 40 years. That's an increase of 1.2 million people or about 25 percent.

So what we see up here, this big blue area,

represents our current treatment capacity and the red line represents the projected waste water flow from the population.

Now, that red flow line considers conservation measures that are in place or will take place over the next 40 years. And even with these conservation measures, somewhere between the year 2030 and 2040 the flow will exceed our treatment plant capacity. By the year 2050 that shortfall is going to be about 30 mgd. So the facilities plan is going to look at a way to accommodate that shortfall of treatment capacity.

Another major need that we are going to look at, that the facilities plan will look at, is to accommodate and promote emerging recycled water readings. The Sanitation Districts have been marketing reclaimed water for over 40 years, and in that time we found over 500 reuse sites throughout Los Angeles County. And you can see some examples up here. Here, this is an industrial use, you can see the purple pipe. We also inject or put ground water or water into the ground for ground water spreading, spreading basins. And then on the right side you see different kinds of irrigation uses.

Despite the efforts of the Sanitation Districts only 40 percent of the available reclaimed water is

actually reused. The other 60 percent goes down rivers and streams and out to the ocean. So one of the objectives is to find a way to increase that amount of recyclable water reuse.

Another major need that we are going to address in the Clearwater master facilities plan is to evaluate our aging infrastructure. We want to be able to provide a means to inspect, repair and replace, if necessary, our aging infrastructure.

There are two tunnels that connect the joint plant to the Pacific Ocean and they were built in 1937 and 1958. So they are quite old, and this shows -- this -- the backdrop of this slide shows the schematic of our tunnel outfall system. And on the right you can see some photos when the tunnels were constructed.

The top of this picture shows a plan view of our system. On the right side here would be the Joint Water Pollution Control Plant. You can see the two tunnels that extend from the joint plant six miles under the Palos Verdes Peninsula to a manifold structure at Royal Palms Beach. At that point it transitions into four outfalls which go out into the Pacific Ocean.

On the bottom of this you can see a profile view of the tunnel outfall system. Again, the joint plant over here on the right. Six miles underneath the

Palos Verdes Peninsula. This represents the ground surface. There are some points where there are almost 600 feet below the ground.

We transition again at Royal Palms Beach to sea floor pipeline out to the ocean. What you will notice from here is that right around here is the coastline. We go out about a mile and a half and this is the water surface here. We are about 150 to 200 feet below surface. The tunnels, because of their length, because of the limited access and because of the constant flow that goes through there, we haven't been able to inspect these tunnels in almost 50 years.

One of projects that we will be evaluating to meet this need is to look at the construction of a new tunnel and new ocean outfall. So the first step in that process is to find an area where the new tunnel and new ocean outflow will go. And you can see that area highlighted in yellow here.

The study area was developed to maintain distance from the discharge from the City of Los Angeles Hyperion outfall in the north and maintain distance from the discharge from the Orange County outfall in the south. You can see our existing tunnel ocean outfall are on the western edge of the study area there. You also see another outfall on the right side of the study

area, which is the outfall from the Terminal Island treatment plant. The Terminal Island treatment plant is run by the City of Los Angeles and it discharges directly into Los Angeles Harbor within the breakwater.

So the first step in determining what alternatives we are going to look at is to find streets that run a direct route from the joint plant to the coastline. These are shown here in orange. And again I would like to remind you that the tunnel would be 200 feet, approximately 200 feet or so below ground surface.

Along these routes we have identified a series of shaft sites. The shaft sites are about four to eight acres in size, although the actual size of the tunnel shaft would only be about 30 to 60 feet in diameter. The shaft site is a location where equipment and labor would be brought into the tunnel and excavated materials will be brought out. I'd like to point out that we anticipate there will probably only be two shaft sites that will be identified as part of the recommended program. One would be at our joint plant and the other would be closer to the coast.

We anticipate that most of the environmental impact from this project is likely to occur at the shaft site. We shared these tunnel alignments and the shaft

sites at a public meeting in March, and based on the input from these meetings as well as the public outreach effort that we have had, the public strongly supports alignment that goes through the Port of Los Angeles.

While I showed you the onshore elements of the tunnel outfall system, here are the offshore elements. We have identified three areas for diffuser locations and the diffusers are essentially pipes with holes in them where the treated waste water is discharged into the ocean. The tunnels will go, we will find the end of the onshore alignment and they will tunnel out to the feasible or what would be selected diffuser area. So the tunnel would go to the diffuser area. There would be a riser or a pipe that would go from the tunnel to the sea floor and connected to the diffuser.

So how do we determine where these areas would be? We looked at our existing outfalls. Our existing outfalls are shown up here in orange color. And our outfalls go about -- the diffuser part of our outfalls are about a mile and a half offshore, and more importantly, about 150 to 200 feet deep.

The white lines that you see on this figure here represent contours of equal ocean depth, so the contours are of equal depth. And if we look at the 150-foot contour and 200-foot contour, you can see that

our diffuser areas are at least as deep as our existing outfall.

One other limiting factor that we have is the Continental Shelf and this is the point where the ocean floor drops off considerably and we can't construct past this point.

So if you look at the diagram, again you can see that we are at least as deep as the diffusers that are existing and are much further offshore. To give you a perspective, it's about a mile and a half offshore, and if we were to go somewhere out into area C, it would be about seven miles past the breakwater.

Because this project involves construction or may involve construction in the ocean, it will require federal permit, and because of that we are going to be subject to the National Environmental Policy Act, also known as NEPA. And as you know, the Army Corps has been decided to be the federal lead agency under NEPA. The Sanitation Districts will be the lead agency under the California Environmental Quality Act, also known as CEQA. Out of this process we are going to prepare a single joint document, joint environmental impact report, environmental impact statement, an EIR/EIS. And even though it is a single document, both the Sanitation Districts and the Army Corps of Engineers

will be responsible for approving this document.

I would like to talk a little bit about the environmental process. At the beginning of it under CEQA a notice of preparation, or NOP, is prepared and under NEPA a notice of intent or NOI is prepared. The Sanitation Districts mailed out the NOP on October 10 and the NOI was published in the Federal Register on October 6. Following that a draft EIR/EIS will be prepared. Following that you will have the final EIR/EIS following a public comment period, and the final EIR

EIS will ultimately be certified.

I would like to point out that there will be many points during this process where the public can provide input on the documents. Following the release of the NOP/NOI which is where we are at now, we have scoping meetings. The scoping meetings are to provide comment on the content and scope of the environmental documents.

Following the draft EIR/EIS will be a public comment period, which will include a public hearing. And following the final EIR/EIS the public will have a chance to input prior to the document certification and approval.

Now, this describes the public input for the

environmental documents, but as Don pointed out, we have been in a public outreach effort for the Clearwater Program since the Beginning of 2007. Our public outreach efforts have included the development of a website, the distribution of newsletters and establishing a telephone hotline. In addition to this, we have met with community leaders and groups and organizations. In fact, to date we have had over 250 meetings with community leaders and we have met with over 40 local groups and organizations.

On top of all of that, in March we had a series of four public workshops to get some input on the masters facilities plan.

Now you might have seen some of the dates on the top of the previous slide. Let me quickly run through the schedules again. From 2007 to the end of the planning process, which is about 2010 we will have our public outreach. We had a series of four public workshops in March. Right now we are in the NOP and NOI and the public scoping meetings.

The draft, the facilities plan draft EIR/EIS, will be available in late 2009 and then the final EIR/EIS and final facilities plan will be ready for approval and certification in mid to late 2010.

So tonight and through the rest of the NOP

and NOI comment period you will have an opportunity to provide comments on the contents and scope of the environmental documents.

The list you see here represents those areas that we have identified that will be covered in the environmental documents. This list -- I know there is a lot up there, but in the NOP, all of these are described in much further detail.

So how can you provide comments on the environmental documents? Well, in a few minutes you will have an opportunity to provide oral comments to us, and even though we will be recording these oral comments, we do encourage you also to provide us your comments in writing, which will allow us to make sure we have captured all of your thoughts.

Written comments can be provided in a couple of different manners. We have got comment forms that were available when you came in. You can also e-mail your comments to either Ken or to Steve, their addresses are on the screen up here. You can also provide letters or you can also send us letters in the mail with your comments and the address, our addresses for both the Army Corps and for the Sanitation Districts are on the bottom of the comment forms that were available.

Comments on the notice of preparation are

going to be due by November 14th and for the NOI will be November 21st.

If you want additional information on the Clearwater Program, you can visit our web site at www.ClearwaterProgram.org. At the website you can get general information on the Clearwater Program and obtain copies of both the NOP and the NOI, or, if you like, you can get some more information by calling our telephone hotline, which is 877-300-water.

At this point I would like to turn it back to Don.

MR. AVILA: Okay, ladies and gentlemen, this is the time where we would like you to come up and give us your comments. And I'm going to call out the names in the order that people signed up to comment. If somebody would like to comment and hasn't filled out a card, I would encourage you to do so. Otherwise, when we are done with the people who have signed up, I would welcome you to come up as well.

When you start, please begin with your name and your affiliation. And when you do give us your comments, if you could please walk up to the mic it would help so our court reporter can hear what is going on.

The first person would be JoAnn Wysocki.

MS. WYSOCKI: I'm short. JoAnn Wysocki, 106 King Avenue, and for Mr. Swenson's benefit, King is one block west of Wilmington Boulevard, our proposed route, and it then it is two more blocks order to Frigate, which is also a proposed route, and it is one more block over to Figueroa, which is also a proposed route.

Mr. Swenson, is the Army Corps of Engineers' primary concern in this project the land environment, the ocean, the harbor environment or both?

MR. SWENSON: So your question is: Is the Army Corps' concern the land environment, the ocean environment or both? In part of the process we make a determination on something called the scope of analysis, that's where we have federal control over it. So it's basically the areas where we would issue a permit or in any kind of area that is directly tied to that. So, for example, our main focus is going to be on the ocean areas. If the project, which as currently proposed involves construction on an outfall structure out in the ocean, that falls within our jurisdiction. And that's the primary activity that we would be issuing a permit for if that's the final decision, to issue a permit.

That being said, there may be certain activities that are directly tied to that construction, for example, let's say they needed to have all their

construction materials, you know, and they needed to store those on some land area some -- on land. Well, that's directly tied to that ocean activity and so we may have control over that as well.

So I guess the answer to your question is mostly, you know, we are concerned with the activity in the ocean, but there may be certain portions on land that we also have control over.

MS. WYSOCKI: The second question is both to sanitation and the Army Corps of Engineers. Does the Los Angeles city Quimby funds regulation apply to this project? Basically what that is is if a development cost is impacting the environment, certain fees have to be paid and in this case they will be paid to the communities of Wilmington and San Pedro. I'm not quite sure about the Harbor.

MR. BOEHMKE: JoAnn, this is the first time I've heard of that fund, so I'm not sure, but we will be meeting and scoping with the City of Los Angeles and I can ask them about that fund then.

MS. WYSOCKI: I have read this notice of preparation and I'm preparing to comment on it. So my question is mainly for the Army engineers. Do you want a separate copy of what I sent to the sanitation department or do you read what is sent to the sanitation

department?

MR. SWENSON: We will be getting copies. Any comments that get submitted to the Sanitation Districts we will be getting copies of those. But you can also, if you would -- you are also free to submit to both, so if you want to submit a copy and e-mail it to us or fax it, mail it, you are free to send copies to us also. We will get it either way.

MS. WYSOCKI: Would you and Mr. Wong provide business cards tonight, maybe leave them on the table?

MR. SWENSON: Sure. We can do that.

MS. WYSOCKI: Now, I do have an alternative route and I worked on it last night so I've got it into the harbor. Out of the sanitation plant in Carson, west on Lomita Boulevard to Vermont Avenue, south through Five Points, along Gaffey to Channel, make a left-hand turn on Channel and you are in the harbor. My intent is to provide all the schools, the churches, the multi-family units, another school, another school -- Dana Strand and a residential one in Wilmington on both sides. I think this will avoid a lot of upset in San Pedro also.

The Federal Register, one of my hats is that I'm a substitute librarian. The Federal Register is in certain libraries, but isn't it also published in one of the business newspapers in Los Angeles?

MR. SWENSON: I'm not sure about that. It is available online as well as, like you said, at certain libraries and whatnot.

MS. WYSOCKI: Now, because it would be very helpful if it was printed in the Los Angeles Times in the Thursday edition where the rest of the notice of the preparation and environmental impacts report and conditional use permits for the city are printed also.

MR. SWENSON: Another thing we do, I should mention is, when we issue a notice of intent in the Federal Register we usually accompany that with public notice. And that's what we have done in this case. And that public notice is mailed out to adjacent landowners and it also gets mailed out to anybody who has put themselves on our public notice mailing list, which they can do by going to our website. So if anybody wants to receive our public notices they can sign up on our website and get those directly. And usually, in this case, notice will be essentially the same materials that you would get in the Federal Register.

MS. WYSOCKI: Is that an open-ended sign up like it is for the Port of Los Angeles?

MR. SWENSON: Yes.

MS. WYSOCKI: They send you everything?

MR. SWENSON: Well, I don't know about that, but

public notices -- you get all public notices to that area.

MS. WYSOCKI: I would like you to very seriously evaluate Frigate Street in Wilmington as part of the route possibly, because it is an extremely narrow street and I invited everyone yesterday to cross over Lomita Boulevard and see how narrow Frigate is.

5.8 and 5.16 are my last comments. That's the truck traffic in the proposed soil removal. It's not just the number of trucks, it's just not the route, but it's the length of time that you would be disposing of this soil.

MR. BOEHMKE: Is the question how long will we be disposing of the material that's removed from the tunnels?

MS. WYSOCKI: Yes.

MR. BOEHMKE: It really depends on where the alignment is and how far out into the ocean it would be built, will depend how long construction time is. We estimated anywhere from four to eight years, and it depends on how many tunnel-boring machines we would actually be using, and that's going to be either one or two. If we go in two different directions, that will cut the construction time down considerably.

MS. WYSOCKI: Thank you.

MR. AVILA: Thank you, JoAnn. The next commenter will be Bill Lyte.

MR. LYTE: Thank you. My name is Bill Lyte. I'm the president of the Harbor Association of Industry and Commerce. I also serve on the Port of Los Angeles Community Advisory Committee and the San Pedro Chamber board of directors, and I'm here representing the Harbor Association tonight. We have 100 plus companies with several thousand employees in the local area.

The L.A. County Sanitation District took the time to meet with our governmental affairs committee. We appreciate that they gave a very detailed presentation and we are here to support the project, both because it provides the critical infrastructure necessary for our region on which we all rely. Secondly, it provides vital construction jobs and procurement opportunities to our local firms, which is particularly important in a very, very, very major recession.

We recommend choosing the excavation sites within the Port of Los Angeles. We think that that will minimize community impacts. We suggest use of electric trucks for any transfer of tunneling excavated debris from the project through the community, and, if possible, that clean excavated material could be used

internal to the port for any port construction projects and that it could potentially be transferred within the port on the interport railroad or by barge.

Thank you.

MR. AVILA: Thank you, Bill.

The next commenter will be Mark Wells.

MR. WELLS: Mark Wells, the publisher of many blogs, including 9 sanpedroissuestoponder.blogspot.com.

My comments are, I'm sure you have all anecdotally heard for almost two years that site No. 6, the Terminal Island outfall source is the best. I don't need to go into that anymore.

One issue that may be thought of, if you are going to consider that, along with the Port of Los Angeles working together is placing into consideration the concept that Terminal Island would be connected to the mainland via a land bridge, because with four bridges, currently three vehicular bridges, one a train bridge. While that is all good, it may not be enough for the future. And I know you are probably going to start construction in 2012 so it's not a good lead time.

My question is: in noticing the map on the Power Point, it appears as though San Pedro, if you

will, the San Pedro part of the community and Wilmington, per se, would not use this outfall system; that the sewage is treated on Terminal Island. Is that a correct statement?

MR. BOEHMKE: The treated waste water comes from our treatment plant in the city of Carson, it's located at Sepulveda and Figueroa.

MR. WELLS: Your waste waters. I saw in the Power Point that the San Pedro area itself are the Terminal Island and part of Wilmington was grey, when all the other places were yellow, just like the Hyperion treatment plant area and other treatment plant areas. I know where you serve, but is San Pedro served by your district?

MR. BOEHMKE: No. San Pedro --

MR. WELLS: No.

MR. BOEHMKE: -- and Wilmington are not served by the Sanitation Districts.

MR. WELLS: So that all of the proposed sites in San Pedro, including Royal Palms or the Angels Gate, other places in San Pedro, including Terminal Island would actually be placed in an area that you have no users. So in effect, wouldn't it be that you would be imposing upon the local residents something that they do not benefit from directly?

MR. BOEHMKE: Well, we would see it as they would benefit because our current tunnel and outfall system goes through that -- goes in that direction right now. And it hasn't been inspected in 50 years and we are not sure of the reliability into the future. So we will be building an infrastructure that would be more reliable for those communities so that there would be less possibility there would ever be failure and then have to be some kind of emergency repair work or other construction activity.

MR. WELLS: That's good for the last 53 years. I live five houses above Western Avenue, so I know where your existing tunnels go. I'm glad of that. Thank you very much.

MR. AVILA: Thank you, Mark.

The final person that has signed up is David Bard.

MR. BARD: Hi, thank you.

David Bard for Marine Animal Care Center at Ft. MacArthur. Forgive me, but I have multi-part questions as well.

You mentined that the public overwhelmingly supports the Port as your shaft site in your route. I would like to know is that the route that you are leaning toward? Also, if you could be a little more

specific on the shaft sites that are in and around the Angels Gate area, since that's where our facility is located as to whether those are being considered and how that would impact us.

And lastly, regarding the pipe, the outfall themselves. Will the new outfall take over for the old one, supplement it basically? Would the outfall load be split between the two? What is the ratio of treated outflow that we are talking about between the two lines? And has the EIR or will the EIR address an analysis of the effect of those outfalls on nutrient loads in the ocean or subsequent effects on the increase of algae and biotoxins and their effect on the marine life?

MR. BOEHMKE: Could you repeat that last part one more time?

MR. BARD: With the second outflow, will the EIR address the impact of that outflow on nutrient loads in the ocean water and its subsequent impact on biotoxins and algae which will subsequently affect marine life in the area?

MR. BOEHMKE: Thank you.

MR. AVILA: Thank you, David.

MR. BOEHMKE: I will go ahead and try to answer those. Hopefully, I have them written down correctly.

MR. BARD: I know there are a lot parts to it, but if you need me to repeat it.

MR. BOEHMKE: Dan, feel free to join in.

Are we leaning towards the Port? We have everything on the table still and we are just starting the environmental documentation right now and the analysis, so I wouldn't say we are leaning one way or another, but we certainly are going to be factoring in public acceptance of the construction locations and the tunnel alignments. As you mentioned, we did hear loud and clear from our public workshops and other meetings that the vast majority of the residential community prefer we go toward the Port and have our construction shaft site in the Port.

Angel Gate location, I'm not that familiar with the exact location that they identified. They were looking for areas that were four to eight acres in size and reasonable shape and slope. And I believe it's the area closer to the ocean, not near the community or the art community buildings that are out there. So, but I can look at a map with you after the meeting and I can kind of get you to the general location.

MR. BARD: Okay.

MR. BOEHMKE: If you give me your information, I can even show you later through e-mail or whatever.

How will the old outfalls be used? We won't we able to determine that until we inspect them. If a new tunnel and ocean outfall is built, it is likely to be sized to handle all the flows projected through the year 2050. At that point we would move the flow into the new tunnel and outfall and then we would dewater the existing ones and see what kind of shape they are in, what it would take if they need repair what it would take to repair them, and a determination won't be made until then.

And will the EIR address water quality issues out of the discharges located in the ocean? Absolutely for nutrient loading and all other constituents.

MR. BARD: Okay, thank you.

MR. AVILA: Thank you, David.

MR. SWENSON: Just to add to that from the U.S. Army Corps of Engineers standpoint, I guess I would just say at some point later in the process the Corps makes a determination on what its preferred alternative is and often that matches up with the applicant's proposed alternative, but not always. As part of the -- I mentioned this earlier, but as part of the -- usually it's part of the final environmental impact statement, we do our 404(b)(1) guidelines analysis and part of that is doing an alternatives analysis. Basically we look at every

different alternative that is proposed for analysis, that could be coming from the applicant -- it could be coming from the public, it could be coming from some agency or group. We look at those different alternatives and we make an assessment on which one is getting any kind of regulating, but basically we determine which one is the least environmentally damaging, practicable alternative.

So we look at the environmental effects and we also look at practicability. What is possible from the engineering standpoint, cost standpoint, and just kind of general logistics. So we look at all of those, make a determination on what -- ultimately what alternative we would issue a permit for.

So in terms of environmental effects, our main focus would be on the marine effects, but there may be some land effects, land impact that we would also be looking at as well.

MR. BARD: In recent years we have seen an increase in the advent of alterations due to natural occurring biohazards directly related to nutrient loads in the water. So I understand in the end all of the outflow is going to go out to the ocean. We are curious as to how it's going to be split up, what the prevailing currents are going to do and what impact it is going to have on

it and I would like to see that happen. Thanks.

MR. AVILA: Our next commenter is Richard Pawlowski. I hope I didn't butcher your name.

MR. PAWLOWSKI: You did fine.

I have got several questions, the first of which, what is the size of the pipe at the outflow going to be? If I understand this correctly, there are different diameters where it is dispersed at the outfall site. It's a 12- to 15- foot pipe and then it goes off in different directions and disperses the water. Did I understand that correctly?

MR. BOEHMKE: It could be sized differently as it's built out in the ocean depending on the hydraulics that are needed to keep the certain flow rates and velocities going through the ports or the pipe openings.

MR. PAWLOWSKI: Very good. So the velocity that the 450 million gallons a day comes out of this thing, have you thought of taking that and using that to generate energy and electricity?

MR. BOEHMKE: I'm not aware of --

MR. PAWLOWSKI: I mean, it's hydraulics. You are pushing this stuff out, rather than using energy to push it in one direction, but rather than capturing that energy as it comes out of the pipe, we feed the energy

back?

MR. BOEHMKE: We can look into that.

MR. PAWLOWSKI: You should, because this is green technology, and that kind of technology, right, Bill -- is what I think you are looking for in these kinds of situations to justify something like this. It's not just taking stuff and dumping it.

I would also like to suggest, and I don't know that you haven't thought of this, is that you -- have you thought of reversing the direction of this entirely, because, you know the snow pack is melting in the Sierras and the Colorado River, the watershed is shrinking. Why not think of taking and reversing the direction of this? If it's semi-clean water and putting it into places that might be able to use it in another way, other lakes, creating other lakes, some other place, even the Owens Valley they have a dust problem. So thinking of reversing some of this stuff or piping it backwards, it doesn't have to be that size, but maybe run some other pipe alongside of the freeways or something to get it out there. Reversing the direction of this thing rather than coming this way only (indicating). Again, the community doesn't really have any benefit, but putting energy thinking into this, how can you use that water being pushed somewhere. That takes a lot of

energy to do that. So use it some other way.

And also, if I understand this correctly, you got 150 trucks per day, 100 to 150 trucks per day removing this dirt that's dug up, someplace. We don't know where that is yet, but that is going to be an impact. And have you included those numbers in any of the 6 EIRs that the port has? Because that's a considerable amount of truck traffic every day for eight years. I mean it's a hell of a lot of trucks. And they have a clean truck program just put into effect in this particular kind of truck program has none of those constraints on it at all. So all the work that has been done on this clean trucks program has absolutely nothing to do with this. And there is a huge amount of pollutants coming right back to us from this. We just got rid of some of this stuff, and I don't think -- and again, I don't know, that this has or has not been thought of.

Let's see what else. Well, I would just leave you to take a look at -- I think that's the main point I would like to make, just consider the energy that you are putting out in the ocean. I used to teach scuba diving also and I understand what this is guy talking about, that this marine environment is pretty sensitive, and it's not just where you put it. You might have a gray

area over there, but it all over the place. So really consider pushing it, try to do it some other place. It's a little bit more -- a little harder to do, maybe even more green if you put it some other direction.

MR. AVILA: Thank you, Richard.

I don't have anybody else signed up to speak, but I would welcome anybody else who would like to come up to the microphone. Please step up, give us your name and if you have any affiliation.

MS. ROMAN: I'm Pat Roman, I'm just a concerned resident of Wilmington, new in the neighborhood. And I guess my No. 1 concern is why is only 40 percent of the water that we are reclaiming, why is only 40 percent of it being used? I think there is a big problem here.

My second, even bigger problem, is how much credence or how much in-depth thought is given to any new construction permit regarding water use and how they handle it. It just seems that we have got all kinds of projects that are potentially going to happen here and I don't hear anybody talking about the real infrastructure of how we are going to support these kind of things.

MR. AVILA: Thank you.

Does anybody else wish to comment? Yes, sir, please step up.

MR. STOLTE: I'm Ron Stolte, and I live on Paseo

Del Mar between Royal Palms and Point Fermin. So my vote is definitely for Terminal Island. My question is, will this environmental impact documentation cover all the choices for the tunneling and the shafts or will by the end of 2009, will you have selected the path for the tunnel and shaft?

MR. BOEHMKE: The environmental impact report will include the evaluation of all of the alternatives for the tunnel alignment and shaft sites and we do intend to have a recommended project when we release the draft EIR at the end of next year. That would include a recommended shaft site and alignment.

MR. STOLTE: Thank you.

MR. AVILA: Thank you. Does anybody else wish to comment this evening?

If not, I would like to thank you very much for coming. We could not do an environmental process like this without help from the community like yourself. Comment forms are available out at the table for anybody who would like to mail in comments still.

For the EIR the comment period goes until November 14th, and for the EIS with the Army Corps it goes until November the 21st. A draft facilities plan and a draft EIS/EIR we expect to release toward the end of next year for your review, but there will be other

opportunities for your input. We will continue group meetings in your community. We will continue newsletters. Our website will continually be updated and you can input through the website, either at the e-mail address or phone number that's listed there. And we would like to recommend that if you have any input that you please send it in to us.

And with that I would like to thank you again for coming this evening and good night.

TIME NOTED: 7:29 p.m.

STATE OF CALIFORNIA )
) ss.
COUNTY OF LOS ANGELES )

I, NANCI L. GRUBE, a Certified Shorthand Reporter for the County of Los Angeles and the State of California, do hereby certify:

That said proceedings was taken before me at the time and place therein set forth, and was taken down by me in shorthand and thereafter transcribed into typewriting under my direction and supervision; that the said transcript is a true record of the proceedings;

I further certify that I am neither counsel for nor related to any party to said action, nor in anywise interested in the outcome thereof.

IN WITNESS WHEREOF, I have subscribed my name this 24th day of November, 2008.

_____
Certified Shorthand Reporter
for the State of California

## Attachment 5

# ADVERTISEMENT FOR PUBLIC SCOPING MEETINGS

CLEARWATER Program

# NOTICE OF PUBLIC SCOPING MEETINGS

The Sanitation Districts of Los Angeles County are in the planning stage of the Clearwater Program. The goal of the Clearwater Program is to ensure the continuation of a wastewater management system that is protective of public health and the environment. As part of the Clearwater Program, the Sanitation Districts will be preparing a new master facilities plan (MFP) for the Joint Outfall System (JOS). The JOS encompasses 73 of the 78 cities in the Sanitation Districts' service area, as well as some unincorporated county areas.

The MFP will guide the development of the JOS through the year 2050 and may result in the approval of one or more projects relating to wastewater management. A major component of the MFP will be the possible construction of a new tunnel and ocean outfall to convey treated wastewater from the Sanitation Districts' Joint Water Pollution Control Plant in Carson to the Pacific Ocean.

The Sanitation Districts have issued a Notice of Preparation (NOP) of an Environmental Impact Report (EIR). The EIR will be prepared jointly with an Environmental Impact Statement (EIS). The U.S. Army Corps of Engineers (Corps) has issued a separate Notice of Intent (NOI) for the EIS. It is anticipated that the draft MFP and draft EIR/EIS will be completed by the end of 2009.

The NOP and NOI, including detailed information about the project, are available at **www.ClearwaterProgram.org**. The Sanitation Districts and the Corps will be conducting a joint public scoping meeting for both the NOP and NOI to receive comments as to the scope of analysis and content of the proposed EIR/EIS.

*This joint scoping meeting will be held on:*

- **Thursday, November 6, 2008, at 6:30 p.m., at the Crowne Plaza Los Angeles Harbor Hotel, 601 South Palos Verdes Street, San Pedro, California.**

*The Sanitation Districts will also be conducting four additional scoping meetings for the NOP on:*

- **Wednesday, October 29, 2008, at 6:30 p.m., at the Carson Community Center, 801 East Carson Street, Carson, California;**
- **Thursday, October 30, 2008, at 1:30 p.m. and 6:30 p.m., at the Sanitation Districts' Joint Administrative Office, 1955 Workman Mill Road, Whittier, California; and**
- **Wednesday, November 5, 2008, at 6:30 p.m., at the Wilmington Senior Center, 1371 Eubank Avenue, Wilmington, California.**

For further information, call the Clearwater Program information line at **(877) 300-WATER.**

SANITATION DISTRICTS OF LOS ANGELES COUNTY

**Attachment 6**

# NOTICE OF AVAILABILITY FOR DRAFT EIR

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

STEPHEN R. MAGUIN
*Chief Engineer and General Manager*

# PUBLIC NOTICE OF AVAILABILITY

## CLEARWATER PROGRAM DRAFT ENVIRONMENTAL IMPACT REPORT

| | |
|---|---|
| **To:** | Mailing List |
| **Lead Agency:** | Sanitation Districts of Los Angeles County |
| **State Clearinghouse Number:** | 2008101074 |
| **Project Title:** | Clearwater Program Master Facilities Plan |
| **Project Location:** | Los Angeles County |

### 1.0 Introduction

The Clearwater Program is a comprehensive planning effort undertaken by the Sanitation Districts of Los Angeles County (Sanitation Districts). Its purpose is to develop a long-range Master Facilities Plan (MFP) for the Joint Outfall System (JOS), a regional wastewater management system serving approximately 4.8 million people in 73 cities and unincorporated areas in Los Angeles County. The Clearwater Program MFP includes an evaluation of infrastructure needs and will serve to guide the management and development of the JOS through the year 2050. As required by the California Environmental Quality Act (CEQA), the Sanitation Districts have prepared a draft Environmental Impact Report (EIR) to assess the potential environmental impacts of the MFP.

Certain elements of the Clearwater Program MFP will require federal permits from the U.S. Army Corps of Engineers (Corps). Consequently, the Sanitation Districts partnered with the Corps in preparing a joint environmental document – the Clearwater Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) – to evaluate the potential environmental impacts of the plan recommended in the MFP and its alternatives. The Sanitation Districts are the lead agency for the EIR under CEQA, and the Corps is the federal lead agency for the EIS under the National Environmental Policy Act (NEPA). The Corps has prepared a separate Notice of Availability (NOA) for the draft EIS.

### 2.0 Background

The Sanitation Districts, a regional public agency, consist of 23 independent special districts that operate under a partnership agreement, sharing staff and administration, with the purpose of serving the wastewater and solid waste management needs of over 5.4 million people in Los Angeles County. The Sanitation Districts' service area covers approximately 820 square miles, encompassing 78 cities and unincorporated territory within the county. The Joint Administrative Office for the Sanitation Districts is located in the city of Whittier.

The JOS is a regional wastewater management system shared by 17 of the 23 Sanitation Districts under a partnership agreement, which provides for a combined investment to maintain and operate the conveyance system and treatment facilities. The JOS spans approximately 660 square miles (Figure 1). Wastewater from city- and county-owned local sewers flows, mainly by gravity, into large trunk sewers. The 1,230 miles of trunk sewers in the JOS are interconnected to seven wastewater treatment plants with a combined treatment capacity of 593 million gallons per day (MGD). Approximately one-third of the wastewater in the JOS system is treated at six water reclamation plants (WRPs), where high-quality recycled water is produced that is either beneficially reused (e.g., landscape irrigation and groundwater recharge) or discharged to rivers and streams. The remaining two-thirds is treated at the Joint Water Pollution Control Plant (JWPCP) located in the city of Carson. The solids removed at the WRPs during the treatment process are returned to the trunk sewers to be centrally processed at the JWPCP.

After the wastewater undergoes full secondary treatment at the JWPCP, it meets all regulatory standards for ocean discharge. From the JWPCP, the treated water (effluent) is transported by two 6-mile long tunnels under the Palos Verdes Peninsula to Royal Palms Beach, where an underground manifold structure connects the tunnels to four ocean outfalls. The outfalls consist of seafloor pipelines that extend up to one-and-one-half miles offshore and reach a depth of 200 feet. The treated effluent exits the outfall pipes through a series of diffuser portholes.

## 3.0 Clearwater Program Purpose and Needs

The overall goal of the Clearwater Program is to identify a plan that is protective of public health and best meets the needs of the JOS through the year 2050 in a cost-effective and environmentally sound manner. Specifically, the Clearwater Program has the following four objectives:

- Provide adequate system capacity to meet the needs of the growing population.
- Provide for overall system reliability by allowing for the inspection, maintenance, repair, and replacement of aging infrastructure.
- Provide support for emerging recycled water reuse and biosolids beneficial use opportunities.
- Provide a long-term solution for meeting water quality requirements set forth by regulatory agencies.

One particular area of concern emerged during the planning process. Currently, the Sanitation Districts rely on two onshore tunnels and four offshore ocean outfall structures to convey effluent from the JWPCP, in the city of Carson, to the Pacific Ocean. The two tunnels were constructed in 1937 and 1958 and have not been inspected for over 50 years. Inspection of the tunnels is not possible due to their overall length, limited access, interconnections between the tunnels, and continuous flow through the tunnels. Furthermore, in January 1995, the JOS service area was inundated by two major back-to-back storm events. The resulting peak wastewater flows in the sewerage system from these storm events nearly exceeded the capacity of the JWPCP ocean discharge system. If the tunnels were to be damaged or the capacity of the ocean discharge system exceeded, treated JWPCP effluent would need to be bypassed into the Wilmington Drain, a stormwater channel that flows through Harbor Regional Park. If sufficient capacity were not available in the Wilmington Drain, the sewers tributary to the JWPCP could overflow and untreated wastewater could enter various water courses, such as the Dominguez Channel and the Los Angeles River. The project purpose and needs are to inspect and upgrade the aging ocean

discharge system, to provide sufficient capacity in the JOS to accommodate the estimated 2050 peak wastewater flows, and to comply with all applicable water quality standards, including regulations prohibiting sewer overflows. To meet these needs, the Clearwater Program MFP evaluates both modifying the existing ocean discharge system and constructing a new ocean discharge system.

## 4.0 Recommended Plan

The Clearwater Program MFP makes the following recommendations for the JOS:

### 4.1 JWPCP Effluent Management

The existing JWPCP ocean discharge system would be modified to accommodate projected flows and allow for the dewatering, inspection, and any necessary repairs/rehabilitation of the two existing effluent tunnels. A new tunnel would be constructed to convey effluent from the JWPCP to the existing ocean outfalls. Under the recommended plan, new ocean outfalls would not be required, but the existing outfalls would need to be rehabilitated (i.e., re-ballasting, joint repairs, and cathodic protection). The proposed tunnel alignment (Figure 2) would begin at the JWPCP West shaft site, continue approximately 2,600 feet south under Figueroa Street, 6,000 feet southwest under Harbor Regional Park, 8,000 feet south under North Gaffey Street, 5,300 feet southwest under Capitol Drive, 5,200 feet south under Western Avenue, 4,000 feet south under South Dodson Avenue, and 5,500 feet southwest under Western Avenue to the Royal Palms shaft site for a total distance of approximately 36,600 feet, or 6.9 miles. The tunnel would range from approximately 70 to 450 feet below ground surface, except at its connection to the existing outfalls, where it would be approximately 30 feet below ground surface. The tunnel would have an external diameter of about 22 feet and an internal finished diameter of about 18 feet.

The tunnel would be constructed with a tunnel boring machine (TBM), which would be placed underground at the JWPCP West shaft site, located near the corner of Lomita Boulevard and Figueroa Street. The TBM would be capable of excavating soil/rock and installing a pre-fabricated concrete tunnel liner as it advances. The excavated material would be removed at the JWPCP West shaft site for disposal or, where possible, beneficial use. Upon completion of tunnel construction, the TBM would be removed at the Royal Palms shaft site, which is located primarily on property owned by the Sanitation Districts at Royal Palms Beach. The beach parking area would be restored to its original configuration. There would be no permanent aboveground facilities at the shaft site, except ground-level access to the shaft and new manifold structure, vent pipes, and access lids.

### 4.2 Wastewater Conveyance and Treatment

Additional treatment plant capacity is required for the JOS by the 2050 planning horizon. The San Jose Creek Water Reclamation Plant (SJCWRP), located at 1965 Workman Mill Road near the city of Whittier, is the most suitable location for a treatment plant expansion. An expansion at the SJCWRP would make more recycled water available where demand for it is greatest. Therefore, it is recommended that the SJCWRP be expanded from its current permitted capacity of 100 MGD to 125 MGD. The unprecedented amount of water conservation being experienced in the JOS service area offsets the projected population growth such that it likely expansion of the SJCWRP will

not be necessary for another 30 years. The current SJCWRP property is large enough to accommodate the recommended expansion.

Process optimization (e.g. flow equalization) is recommended at the SJCWRP, Pomona Water Reclamation Plant (POWRP), Los Coyotes Water Reclamation Plant (LCWRP), and Long Beach Water Reclamation Plant (LBWRP). The POWRP is located at 295 Humane Way on a 14-acre site in the city of Pomona, the LCWRP is located at 16515 Piuma Avenue in the city of Cerritos, and the LBWRP is located at 7400 East Willow Street on a 17-acre site within the city of Long Beach. The current plant properties are large enough to accommodate the recommended process optimization facilities. Consequently, construction of the facilities would not require acquisition of additional land. Flow equalization facilities at the LCWRP can be built under the existing driving range for the Iron-Wood Nine Golf Course and thus not impact its long-term use.

Based on the projected wastewater flows for the year 2050 and a 25-MGD expansion at the SJCWRP, approximately 33 miles of Joint Outfall trunk sewers will require some type of relief (addition of parallel pipes for increased capacity). The Sanitation Districts would continue to closely monitor the JOS conveyance system throughout the planning period to determine actual relief needs. The future conveyance system improvement projects would be implemented on an as-needed basis.

## 4.3 Solids Processing

One byproduct of wastewater treatment and purification is residual solids, often referred to as sludge. It is recommended that solids processing continue to be centralized at the JWPCP using existing systems. Additional sludge stabilization capacity consisting of six new anaerobic digesters will be required at the JWPCP by 2050. The current JWPCP property is large enough to accommodate the additional digesters, so additional land would not be required. The timing for digester construction is dependent on future trending of sludge production at the JWPCP.

The JWPCP currently produces enough electricity from the biogas produced in the anaerobic digesters to be self-sufficient. Additional gas resulting from an increased number of digesters would be managed by the existing steam boilers and gas turbines. The turbines are currently supplemented with natural gas. As digester gas increases, it would be used in lieu of natural gas.

The capacity of the existing sludge dewatering system is anticipated to be sufficient to meet the projected quantities through 2050. Therefore, no additional sludge dewatering facilities would be required throughout the planning period. During this time, the Sanitation Districts would continue the current program of replacing aging centrifuges as needed.

## 4.4 Biosolids Management

Once stabilized and dewatered, the residual solids are converted into a material called biosolids that can be beneficially used. It is projected that the JOS biosolids generation rate will increase nearly 30 percent during the planning period. The continuation of the current biosolids management practices is recommended. The Sanitation Districts have a robust and diverse system in place that can handle the projected increase.

The Sanitation Districts currently co-dispose biosolids in landfills, but this option will be lost with the scheduled closure of the Puente Hills Landfill (near the city of Whittier) in 2013. However, the Westlake Farms Composting Facility (Kings County) should begin operations by the same year, and can be expanded in phases if and when future needs arise. Therefore, it is anticipated that there is no additional physical infrastructure required to accommodate future biosolids management. The Sanitation Districts will continue to explore options that provide for additional biosolids management diversity and further optimize the beneficial use of this material.

### 4.5 WRP Effluent Management

The continuation of current practices for WRP effluent management is recommended. The existing effluent management system effectively allows the Sanitation Districts to meet current reuse demands and discharge any excess recycled water to surface waterways. While the amount of reuse is likely to increase in the future, surface water discharge capabilities would be retained. The Sanitation Districts will continue to work cooperatively with water supply agencies to help them expand reuse. In addition, flow equalization at the SJCWRP, POWRP, LCWRP, and LBWRP may facilitate increased reuse by making more recycled water available during periods of the day when demands are greatest.

## 5.0 Potential Significant Environmental Effects

The draft EIR assesses environmental impacts for both the construction and operational elements of the recommended plan and identifies mitigation measures to avoid or reduce the significant impacts. The recommended plan would cause four significant and unavoidable impacts:

- Aesthetics impacts due to 20-foot high walls or barriers that would be temporarily erected at the JWPCP West and Royal Palms shaft sites to reduce noise impacts during construction.
- Air quality impacts due to construction-related equipment and vehicle exhaust.
- Greenhouse gas impacts due to construction-related equipment and vehicle exhaust.
- Cultural resource impacts due to the potential of disturbing or destroying unique paleontological resources or geological features during tunneling and shaft construction.

## 6.0 Public Review and Public Hearing

Pursuant to Section 21091 of the Public Resources Code, the draft EIR for the Clearwater Program MFP will be available for public review during an extended 60-day review period beginning on February 10, 2012 and closing on April 10, 2012. Comments on the draft EIR should be sent to the following address:

Steven W. Highter
Supervising Engineer, Planning Section
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601
shighter@lacsd.org

The draft EIR will be available for review online at www.ClearwaterProgram.org. Hardcopies will be available for review at the following locations:

Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California

Carson Regional Library
151 East Carson Street
Carson, California

Los Angeles Public Library
San Pedro Branch
921 South Gaffey
San Pedro, California

Los Angeles Public Library
Wilmington Branch
1300 North Avalon
Wilmington, California

The Sanitation Districts and the Corps will be conducting a joint public hearing to receive comments on both the draft EIR and draft EIS on:

Thursday, March 8, 2012, at 6:30 pm
Crowne Plaza Los Angeles Harbor Hotel
601 South Palos Verdes Street
San Pedro, California

The Sanitation Districts will also be conducting two additional public hearings to receive comments on the draft EIR on:

Tuesday, March 6, 2012, at 6:30 pm
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California

Wednesday, March 7, 2012, at 6:30 pm
Carson Community Center
801 East Carson Street
Carson, California

Please share this notice with anyone else you feel may be interested.

Date: 1/26/2012

Charles E. Boehmke
Assistant Head, Facilities Planning Department
Sanitation Districts of Los Angeles County

**FIGURE 1**

CLEARWATER Program

## Existing Joint Outfall System

Source: Sanitation Districts of Los Angeles County 2011, Thomas Bros 2011, ESRI 2011

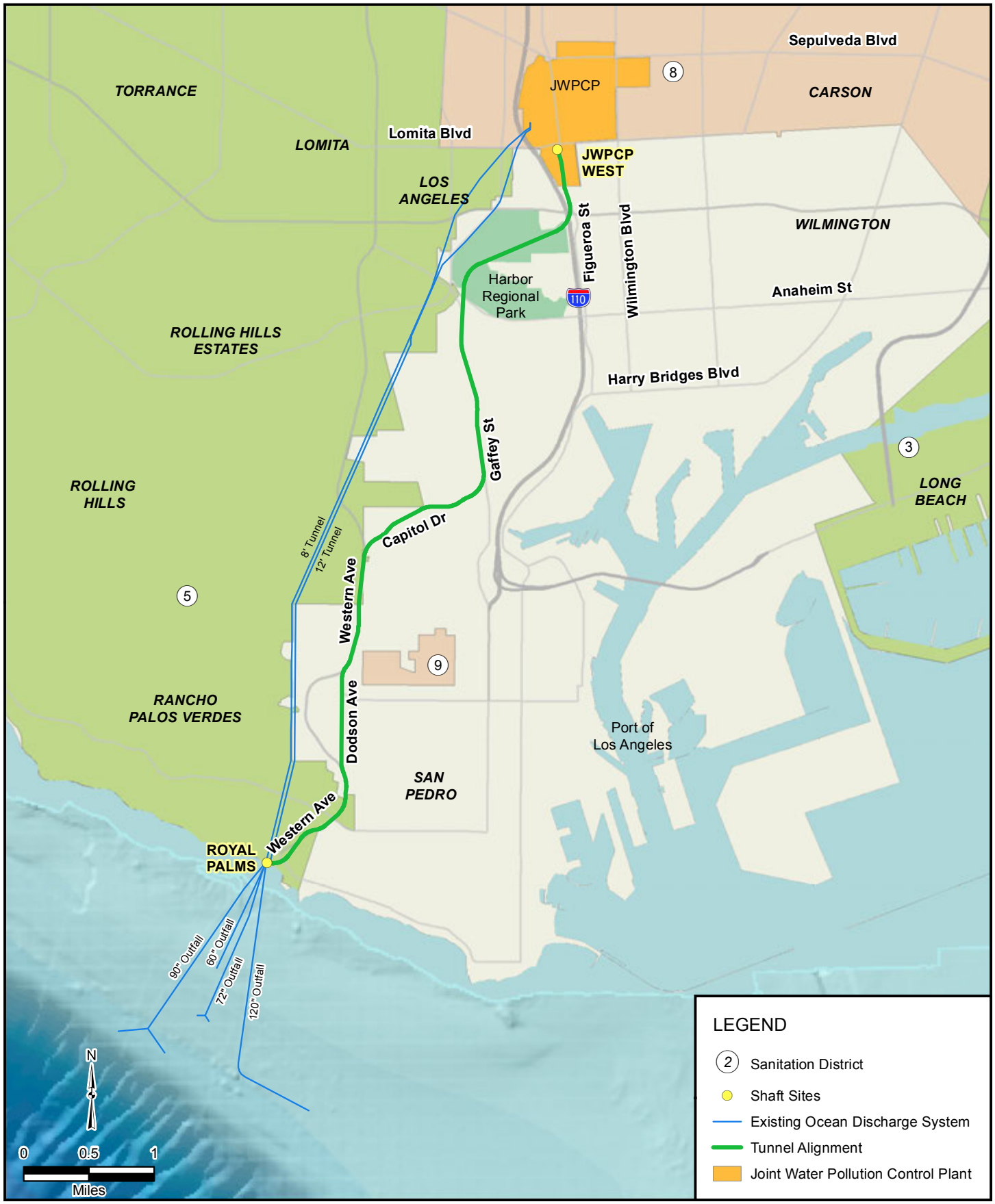


**FIGURE 2**

CLEARWATER Program

## Recommended Tunnel Alignment

Source: Sanitation Districts of Los Angeles County 2011, Thomas Bros 2011, ESRI 2011

**Attachment 7**

# NOTICE OF AVAILABILITY FOR DRAFT EIS

# NOTICE OF AVAILABILITY

**U.S. ARMY CORPS OF ENGINEERS** **BUILDING STRONG®**

February 10, 2012

## CLEARWATER PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT

The U.S. Army Corps of Engineers, Los Angeles District (Corps) in conjunction with the Sanitation Districts of Los Angeles County (Sanitation Districts) has completed a Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Clearwater Program. The Clearwater Program is a comprehensive planning effort undertaken by the Sanitation Districts. Its purpose is to develop a long-range Master Facilities Plan for the Joint Outfall System, a regional wastewater management system serving approximately 4.8 million people in 73 cities and unincorporated areas in Los Angeles County. A major component of the Clearwater Program is the evaluation of alternatives for new ocean outfalls and rehabilitation of the existing ocean outfalls. Both activities would entail discharge of dredged and fill material in waters of the United States, work in navigable waters of the United States, and the transport of dredged material for ocean disposal. These activities would require authorization from the Corps pursuant to Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act, respectively.

Questions or comments concerning the Draft EIS/EIR should be directed to Dr. Aaron O. Allen, U.S. Army Corps of Engineers, Los Angeles District, Regulatory Division, Ventura Field Office, 2151 Alessandro Drive, Suite 110, Ventura, CA 93001, (805) 585-2148.

**SUPPLEMENTAL INFORMATION**: The Draft EIS/EIR is available for a 60-day review period from February 10, 2012 through April 10, 2012. The document is accessible via the World-Wide Web at www.ClearwaterProgram.org. Alternatively, printed copies are available at the following locations: Sanitation Districts of Los Angeles County, 1955 Workman Mill Road, Whittier, California; Carson Regional Library, 151 East Carson Street, Carson, California; Los Angeles Public Library, San Pedro Branch, 921 South Gaffey Street, San Pedro, California; Los Angeles Public Library, Wilmington Branch, 1300 North Avalon, Wilmington, California.

**PUBLIC MEETING**: The Sanitation Districts and the Corps will jointly hold a public hearing to receive public comments regarding the Draft EIS/EIR on March 8, 2012, 6:30 p.m., at the Crowne Plaza Hotel Los Angeles Harbor Hotel, 601 South Palos Verdes Street, San Pedro, California. Written comments will be accepted until the close of public review on April 10, 2012.

*Regulatory Program Goals:*

- To provide strong protection of the nation's aquatic environment, including wetlands.
- To ensure the Corps provides the regulated public with fair and reasonable decisions.
- To enhance the efficiency of the Corps' administration of its regulatory program.

BILLING CODE: 3710-KF-P

DEPARTMENT OF DEFENSE

AGENCY: Department of the Army, U.S. Army Corps of Engineers

ACTION: Notice of Availability

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24 Jan 2012
DATE

David J. Castanon
Chief, Regulatory Division
Corps of Engineers

## Attachment 8
# NOTICE OF COMPLETION

Print Form

*Appendix C*

# Notice of Completion & Environmental Document Transmittal

*Mail to:* State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
*For Hand Delivery/Street Address:* 1400 Tenth Street, Sacramento, CA 95814

**SCH #** 2008101074

**Project Title:** Clearwater Program Master Facilities Plan

Lead Agency: Sanitation Districts of Los Angeles County
Contact Person: Steven W. Highter
Mailing Address: 1955 Workman Mill Road
Phone: (562) 908-4288 x2711
City: Whittier, CA
Zip: 90601
County: Los Angeles

**Project Location:** County: Los Angeles County
City/Nearest Community: Carson
Cross Streets: Countywide
Zip Code: _____
Longitude/Latitude (degrees, minutes and seconds): ____° ____′ ____″ N / ____° ____′ ____″ W Total Acres: _____
Assessor's Parcel No.: n/a
Section: _____ Twp.: _____ Range: _____ Base: _____
Within 2 Miles: State Hwy #: _____
Waterways: _____
Airports: _____
Railways: _____
Schools: _____

**Document Type:**

CEQA: ☐ NOP ☒ Draft EIR NEPA: ☐ NOI Other: ☒ Joint Document
☐ Early Cons ☐ Supplement/Subsequent EIR ☐ EA ☐ Final Document
☐ Neg Dec (Prior SCH No.) _____ ☒ Draft EIS ☐ Other: _____
☐ Mit Neg Dec Other: _____ ☐ FONSI

**Local Action Type:**

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☒ Coastal Permit
☐ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☒ Other: Master Facilities

**Development Type:**

☐ Residential: Units _____ Acres _____
☐ Office: Sq.ft. _____ Acres _____ Employees _____
☐ Commercial: Sq.ft. _____ Acres _____ Employees _____
☐ Industrial: Sq.ft. _____ Acres _____ Employees _____
☐ Educational: _____
☐ Recreational: _____
☐ Water Facilities: Type _____ MGD _____
☐ Transportation: Type _____
☐ Mining: Mineral _____
☐ Power: Type _____ MW _____
☒ Waste Treatment: Type wastewater MGD 25
☐ Hazardous Waste: Type _____
☒ Other: Wastewater Conveyance & Effluent Management

**Project Issues Discussed in Document:**

☒ Aesthetic/Visual ☒ Fiscal ☒ Recreation/Parks ☒ Vegetation
☒ Agricultural Land ☒ Flood Plain/Flooding ☒ Schools/Universities ☒ Water Quality
☒ Air Quality ☒ Forest Land/Fire Hazard ☒ Septic Systems ☒ Water Supply/Groundwater
☒ Archeological/Historical ☒ Geologic/Seismic ☒ Sewer Capacity ☒ Wetland/Riparian
☒ Biological Resources ☒ Minerals ☒ Soil Erosion/Compaction/Grading ☒ Growth Inducement
☒ Coastal Zone ☒ Noise ☒ Solid Waste ☒ Land Use
☒ Drainage/Absorption ☒ Population/Housing Balance ☒ Toxic/Hazardous ☒ Cumulative Effects
☒ Economic/Jobs ☒ Public Services/Facilities ☒ Traffic/Circulation ☒ Other: GHG & Marine Env.

**Present Land Use/Zoning/General Plan Designation:**

Countywide

**Project Description:** *(please use a separate page if necessary)*

See attached

*Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.*

Revised 2010

## Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

| | | | |
|---|---|---|---|
| S | Air Resources Board | S | Office of Historic Preservation |
| S | Boating & Waterways, Department of | | Office of Public School Construction |
| S | California Emergency Management Agency | S | Parks & Recreation, Department of |
| | California Highway Patrol | | Pesticide Regulation, Department of |
| S | Caltrans District # 7 | S | Public Utilities Commission |
| | Caltrans Division of Aeronautics | S | Regional WQCB # 4 |
| | Caltrans Planning | S | Resources Agency |
| | Central Valley Flood Protection Board | | Resources Recycling and Recovery, Department of |
| | Coachella Valley Mtns. Conservancy | | S.F. Bay Conservation & Development Comm. |
| S | Coastal Commission | S | San Gabriel & Lower L.A. Rivers & Mtns. Conservancy |
| | Colorado River Board | | San Joaquin River Conservancy |
| S | Conservation, Department of | S | Santa Monica Mtns. Conservancy |
| | Corrections, Department of | S | State Lands Commission |
| | Delta Protection Commission | | SWRCB: Clean Water Grants |
| | Education, Department of | S | SWRCB: Water Quality |
| | Energy Commission | | SWRCB: Water Rights |
| S | Fish & Game Region # 5 | | Tahoe Regional Planning Agency |
| S | Food & Agriculture, Department of | | Toxic Substances Control, Department of |
| | Forestry and Fire Protection, Department of | S | Water Resources, Department of |
| | General Services, Department of | | |
| | Health Services, Department of | S | Other: Department of Public Health |
| | Housing & Community Development | S & S | Other: SCAQMD & California EPA |
| S | Native American Heritage Commission | | |

**Local Public Review Period (to be filled in by lead agency)**

Starting Date February 10, 2012 Ending Date April 10, 2012

**Lead Agency (Complete if applicable):**

Consulting Firm: ICF International
Address: 1 Ada, Suite 100
City/State/Zip: Irvine, CA 92618
Contact: Donna McCormick
Phone: (949) 333-6622

Applicant: N/A
Address:
City/State/Zip:
Phone:

**Signature of Lead Agency Representative:** Steven W. Lightfoot **Date:** 2/7/2012

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

# NOTICE OF COMPLETION
# PROJECT DESCRIPTION

The Clearwater Program is a comprehensive planning effort undertaken by the Sanitation Districts of Los Angeles County (Sanitation Districts) with the purpose of developing a long-range master facilities plan (MFP) for the Joint Outfall System (JOS), a regional wastewater management system serving over 5 million people in 73 cities and unicorporated areas of Los Angeles County. The Clearwater Program MFP includes an evaluation of infrastructure needs and will serve to guide the management and development of the JOS through the year 2050.

The JOS is a regional, interconnected wastewater management system shared by 17 of the 23 Sanitation Districts under a partnership agreement, which provides for a combined investment to maintain and operate the conveyance system and the treatment facilities. The JOS is located in the central, southern, and eastern portions of Los Angeles County.

The Clearwater Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) provides both program-level and project-level analysis. The Clearwater Program includes five program component areas:

- Wastewater Conveyance and Treatment
- Water Reclamation Plant (WRP) Effluent Management
- Solids Processing
- Biosolids Management
- Joint Water Pollution Control Plant (JWPCP) Effluent Management

The project-level analysis relates to the JWPCP effluent management component area, which includes a working shaft site at the JWPCP; an 18-foot-diameter, 6-mile-long onshore tunnel between the JWPCP and the existing ocean outfall manifold structure at Royal Palms Beach near White Point; an exit shaft site at Royal Palms Beach; and the rehabilitation of the existing ocean outfalls.

## Areas of Controversy

Public outreach for the Clearwater Program began in January 2007 and continues today. Consequently, affected agencies and the general public have been made a part of the planning process and the alternatives screening process. This led to a recommended program and project that avoided many of the impacts that were of concern early in the process. Some of the concerns raised during the outreach included:

- Impacts on air qualitys
- Impacts on traffic
- Location of tunnel shaft sites
- Project location and tunnel alignments

- Impacts on parks
- Impacts on ocean nutrients and algal blooms

## Issues to Be Resolved

Issues to be resolved for the Clearwater Program include the Sanitation Districts' choices among alternatives and whether or how to mitigate significant impacts.

**Attachment 9**

# ADVERTISEMENT FOR PUBLIC HEARINGS

CLEARWATER Program

# NOTICE OF PUBLIC HEARINGS

## *Draft Environmental Impact Report/ Environmental Impact Statement*

As part of a comprehensive planning effort called the Clearwater Program, the Sanitation Districts of Los Angeles County (Sanitation Districts) have completed a draft Master Facilities Plan (MFP) for the Joint Outfall System (JOS), a regional wastewater management system serving approximately 4.8 million people in 73 cities and unincorporated areas of Los Angeles County. The MFP evaluates the infrastructure needs of the JOS through the year 2050 and makes recommendations on how to ensure the continuation of the JOS as a reliable and cost-effective wastewater management system that is protective of public health and the environment.

The recommended project in the MFP includes the construction of a new 18-foot diameter, 7-mile long tunnel to convey treated wastewater effluent from the Joint Water Pollution Control Plant in Carson to the Pacific Ocean off of White Point. The new tunnel, which would tie into existing ocean outfalls at Royal Palms Beach, would allow for inspection and any necessary repairs of two existing tunnels that flow full every day and have not been inspected for over 50 years.

The Sanitation Districts and the U.S. Army Corps of Engineers (Corps) have prepared a joint draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Clearwater Program MFP pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). Public hearings will be conducted during the extended public review period for the draft EIR/EIS, which ends on April 10, 2012. The Clearwater Program MFP and EIR/EIS can be viewed at www.ClearwaterProgram.org.

The Sanitation Districts and the Corps will hold a joint public hearing to receive comments on both the draft EIR and draft EIS on:

**Thursday, March 8, 2012, at 6:30 pm (Doors open at 6:00 pm)**

***Crowne Plaza Los Angeles Harbor Hotel***
601 South Palos Verdes Street
San Pedro, California

The Sanitation Districts will be conducting two additional public hearings to receive comments on the draft EIR on:

**Tuesday, March 6, 2012, at 6:30 pm (Doors open at 6:00 pm)**

***Sanitation Districts of Los Angeles County***
1955 Workman Mill Road
Whittier, California

**Wednesday, March 7, 2012, at 6:30 pm (Doors open at 6:00 pm)**

***Carson Community Center***
801 East Carson Street
Carson, California

SANITATION DISTRICTS OF LOS ANGELES COUNTY

R086433



# Stars

*(Continued from page 25)*

potency and the impact that those circling thoughts can make. The truth is the thoughts typically come first and then the emotions follow as a result of whatever thoughts are brewing in the brain. Once your emotions get activated, that is where you live and where you swim. As Mars retrogrades back through your house of the mind, you will be re-discovering the power of when the heart and mind are united, when they work for and with one another to keep you stable and sound. You are becoming more practical and aware versus allowing certain emotions to lead, and with Uranus in Aries now you are also becoming more objective within your emotional reality, which will help prevent you from getting consumed with certain emotions that have felt like they were holding you back. Venus is also in Aries in your house of control, and she is reaching out with intent to the North Node, the symbol for your destiny, in your house of habits. This symbolizes you taking charge of your future in a productive, passionate way. It reflects learning how to get the mind to work for you in order to help you get the results that your heart wants. You are in control now, direct the motion or it will direct you!

**♌LEO**

Often times all it takes is a warm fire after coming in from the cold, or a gentle cool breeze after a hot spell in the heat, to create relief or to calm the inner unrest. When the body is comfortable, far more is possible, and the emotions can stabilize too. I heard someone say somewhere, "There is nothing a warm bath and a good night's sleep can't fix." The same could be said about a supportive Venus transit. As we move into the weekend, loving Venus in fellow fire sign Aries reaches out to the North Node, the symbol for your destiny, in fellow fire sign Sagittarius, and a gesture of love or assistance at just the right time makes your day. You may also find a way to get what you need and even some of what you want as she works to improve your life. If nothing else, she will serve as "an usher with a flashlight" to show you your next step, or to shine the light on hope that lies ahead. Stay open to what your current situation can offer as there may be something you are still missing that is meant to serve you along the way. When the heart opens, doors open!

**♍VIRGO**

There is a clear advantage not only in having Mars, the planet of action and desire in your sign but also having Mars currently moving retrograde. I know that may sound a bit backward, but what the retrograde is giving you is time. It is taking the heat off of something so you can think before you do something that you otherwise might regret. It is helping you get your bearings straight, and it is helping you prepare yourself for this next leg in your journey, which reflects a new cycle of some sort. At the same time, on Fri., Feb. 17, Venus in your house of the soul reaches out to the North Node, the symbol for your destiny in your house of home, and the emotional body to usher in some support and to ease a certain burden. Mercury, your ruler is also moving through your house of relationships now, which may have you attracting all sorts of attention. You have the magic touch Virgo. "Ask and you shall receive!"

**♎LIBRA**

A great deal can happen in a week so I do what I can to search for the things that might give you a boost in the middle of a potentially long and drawn-out process. That has been the nature of the times for you, Libra, in the past few years with Saturn moving through your sign. It has been a long, drawn-out something that has required much more from your heart, body and soul than you thought you ever had in you. If you answered the call and you did the work, you may be currently benefiting from the discipline required. If you are still steeped in something, there is hope on the horizon. Venus, your ruler, is in your house of relationships and connects beautifully with the North Node, the symbol for your destiny on Fri., Feb. 17, in your house of communication. A conversation or meeting could prove to be fruitful whereby you finally feel like progress is near or here. All relationships have an opportunity to improve this week if you reach out with spontaneity, love, and adventure. One little spark could get a good loving fire going. Light the match!

**♏SCORPIO**

This week, if you bend your ear with someone you love, the added time, attention and effort will truly pay off. There will be far more that you will come to know and understand if you experience a bit more deeply another person's reality, which will have a way of immediately improving your connection with them and your mutual understanding of one another. Venus, the planet of listening, is in your house of improvements, so if you feel you are missing something, or not clear about how someone feels, or where they are coming from, sit and stay but don't speak - simply listen. Also, Venus in this position can help you find better ways to feel better across the board by removing some of those unhealthy habits and replacing them with something that nourishes the body. With Mercury in fellow water sign Pisces, you are going to be highly receptive and sensitive to the world around you, which can help you read the intentions of others as well as heightening your communicating ability will an effortlessly flow. It may feel as if someone in the ethers is speaking for you and through you. That is true teamwork!

**♐SAGITTARIUS**

If the tension is high today, it should easily break by Fri., Feb. 17, if not before as Venus, the planet of love, makes a pleasing alignment to the North Node, the symbol for your destiny, in your sign, Sag. You get a break and will feel some sweet relief from a current, pressing matter where you have previously felt helpless. The universe already knows what you need and you will soon see the truth of this knowing as the edge is taken off a certain nagging burden. With Mercury in Pisces in your house of home, there is a great deal of emotion that may be hidden that you are not addressing because you don't feel you have the energy to deal with it all, or you fear the reactions of others. In essence, it may feel as if there is far too much beyond your control. What you can control and influence is how you respond inwardly to all that is going on around you. You will get the help you need. Someone will show up well for you and your invisible guides are forever hovering near!

**♑CAPRICORN**

Letting go, easier said than done, especially for you Capricorn. Letting go, when it happens, the Capricorn wonders, "What in the heck took me so long?" There is an art in surrendering to the inevitable, an art in surrendering expectations for certain outcomes;


CLEARWATER
Program

**NOTICE OF PUBLIC HEARINGS**

*Draft Environmental Impact Report/ Environmental Impact Statement*

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R036433



# Shootout hero is ID'd unofficially

**LONG BEACH:** ICE agent came running to assist colleague who was under attack.

By Tracy Manzer Staff Writer

An Immigration and Customs Enforcement agent was the hero who came to the rescue of an unarmed agent repeatedly shot by a colleague at close range last week in Long Beach, sources said Monday.

As Deputy Special Agent in Charge Kevin Kozak recuperated Monday from six gunshot wounds, sources close to the investigation who spoke on condition of anonymity identified the agent who came to Kozak's rescue as Perry Woo.

Woo intervened after Kozak was shot by Supervising Special Agent Ezequiel Garcia as the two had a heated discussion over Garcia's job performance Thursday, federal officials said.

Sources said Woo came running after the gunfire broke out and struggled to get Garcia's gun before opening fire with his own service weapon. Garcia was fatally shot in the exchange. Kozak wasn't wearing his firearm and was sitting behind his desk when Garcia shot him several times, sources said.

Kozak, who has nearly 30 years on the job, was hit in the hand, knee and stomach, ICE spokeswoman Virginia Kice said. He is recuperating at St. Mary Medical Center in Long Beach.

FBI spokeswoman Laura Eimiller said Monday the FBI was not identifying the third agent.

The investigation is being led by the FBI in cooperation with ICE and the Long Beach Police Department. Once the FBI completes its investigation, it will be turned over to the U.S. Attorney's Office for review, Eimiller said.

ICE Special Agent in Charge Claude Arnold, Kozak's direct supervisor, said Friday that Kozak was counseling Garcia on his job performance. Arnold also said he was unaware of rumors of ongoing tension between Kozak and Garcia, and he refused to discuss reports that Garcia had filed numerous complaints at work and had asked for a transfer.

Some sources described Kozak as a tough taskmaster who was hard to please. They also characterized Garcia as disgruntled.

Authorities said Kozak, 51, is one of two deputies in the Long Beach office who report directly to ICE's Los Angeles office, and he has been assigned to the Long Beach office since August 2004.

He began his career almost 30 years ago with the U.S. Customs Service in San Diego, transferred to the U.S. Customs office in Miami, where he served as a criminal investigator until 2001, and returned to California at that time to become a supervising investigator in Los Angeles.

Garcia, 46, supervised a Document and Benefit Fraud Task Force and answered to Kozak. He began his career in 1988 with INS and became a criminal investigator in 1991, when he transferred to Los Angeles.

In 2003, the INS was abolished and Garcia became part of the new ICE agency. In 2004, Garcia was promoted to supervisor and served in that capacity until his death.

[illegible]

[illegible]

# 911 call details may be more restricted

**STATE:** Demi Moore incident spurred the proposal by a former police dispatcher.

By Don Thompson
The Associated Press

SACRAMENTO — A state lawmaker upset over details revealed in a recent emergency call involving actress Demi Moore is seeking to restrict the sort of information that can be publicly disclosed in 911 tapes.

"Eyes rolling back, foaming at the mouth, bleeding from a body part — that's nobody's business but the medical personnel and the patient. I think it has crossed the line," said Assemblywoman Norma Torres, who was a Los Angeles Police Department emergency dispatcher for more than 18 years before her election to the Legislature in 2008.

Current law already allows law enforcement agencies to withhold personal details, but Torres' AB1275 would prohibit them from releasing medical or personal identifying information contained in emergency calls.

The measure by Torres, D-Pomona, is one of hundreds proposed by lawmakers ahead of a Friday deadline to introduce bills to be considered this year. This is the second year of a two-year session. Typically, it produces a few hundred bills less than the first year.

Last year, lawmakers introduced 2,381 bills and sent 870 of them to the governor, who signed 774 into law. In 2010, lawmakers considered 1,871 bills and sent 1,029 of them to the governor, of which 722 became law.

The bills being introduced for this year face months of committee hearings before the Legislature's scheduled adjournment Aug. 31.

The bill by Torres, D-Pomona, already is causing a stir.

She said her intent is to prevent only the disclosure of medical conditions, but her one-sentence bill contains a second restriction. It says that, "Notwithstanding any other law, a public agency shall not disclose any portion of a 911 emergency telephone call providing medical or personal identifying information."

Her spokeswoman, Catalina Martinez, said Torres intends a narrow interpretation: "Social Security number, home address, that type of personal information. That's what we mean by that."

Critics of the legislation said federal and state laws already provide enough protections.

**"If she's overdosing, on drugs, that's fair game. What symptoms she has as a result of that overdose, none of your business."**

— ASSEMBLYWOMAN NORMA TORRES, a former Los Angeles Police Department emergency dispatcher who wants to restrict the type of information that can be released publicly in 911 tapes

The media generally can obtain copies of emergency dispatch tapes under the California Public Records Act. The law already allows agencies to withhold information "that is medical or personal that if disclosed would cause an unwarranted invasion of privacy," said Jim Ewert, general counsel for the California Newspaper Publishers Association.

It's up to each agency to decide what qualifies.

In Moore's case, Los Angeles fire officials, acting on the advice of the city attorney's office, cited federal medical privacy rules in redacting details about the actress' medical condition and substances that witnesses said she might have ingested or smoked. Moore's publicists did not respond to requests for comment.

People could hesitate before calling 911 if they realize their conversations can be made public, said Peter Scheer, executive director of the First Amendment Coalition. But he said more restrictions could tip the balance too far in limiting the public's right to know how emergency workers respond.

Here are some of the other bills that have been introduced ahead of Friday's deadline:

- Pet groomers would have to get a license under a bill by Democratic Sen. Juan Vargas of San Diego.
- A year after successfully authoring a bill prohibiting the open carry of unloaded handguns, Assemblyman Anthony Portantino, D-La Canada Flintridge, proposes to ban the open display of unloaded rifles and shotguns as well.
- State and local public employees' pensions would be capped at $80,000 a year if the retiree also receives Social Security, and $100,000 if they do not, under a bill by Assemblyman Donald Wagner, R-Irvine.
- Rank-and-file state employees would get more protections when they face disciplinary action, under AB1655. The bill by Assemblyman Roger Dickinson, D-Sacramento, would create a Public Employee's Bill of Rights Act.
- Prison inmates could receive only medically necessary treatment under SB1079.
- Lenders would be prohibited from foreclosing on a home while the borrower is negotiating a mortgage modification under A bill by Assemblyman Mike Eng, D-Monterey Park.


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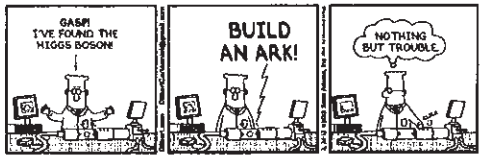



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## CLEARWATER Program

## NOTICE OF PUBLIC HEARINGS

*Draft Environmental Impact Report/ Environmental Impact Statement*

As part of a comprehensive planning effort called the Clearwater Program, the Sanitation Districts of Los Angeles County (Sanitation Districts) have completed a draft Master Facilities Plan (MFP) for the Joint Outfall System (JOS), a regional wastewater management system serving approximately 4.8 million people in 73 cities and unincorporated areas of Los Angeles County. The MFP evaluates the infrastructure needs of the JOS through the year 2050 and makes recommendations on how to ensure the continuation of the JOS as a reliable and cost-effective wastewater management system that is protective of public health and the environment.

The recommended project in the MFP includes the construction of a new 18-foot diameter, 7-mile long tunnel to convey treated wastewater effluent from the Joint Water Pollution Control Plant in Carson to the Pacific Ocean off of White Point. The new tunnel, which would tie into existing ocean outfalls at Royal Palms Beach, would allow for inspection and any necessary repairs of two existing tunnels that flow full every day and have not been inspected for over 50 years.

The Sanitation Districts and the U.S. Army Corps of Engineers (Corps) have prepared a joint draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Clearwater Program MFP pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). Public hearings will be conducted during the extended public review period for the draft EIR/EIS, which ends on April 10, 2012. The Clearwater Program MFP and EIR/EIS can be viewed at www.ClearwaterProgram.org.

The Sanitation Districts and the Corps will hold a joint public hearing to receive comments on both the draft EIR and draft EIS on:

**Thursday, March 8, 2012, at 6:30 pm (Doors open at 6:00 pm)**
***Crowne Plaza Los Angeles Harbor Hotel***
601 South Palos Verdes Street
San Pedro, California

The Sanitation Districts will be conducting two additional public hearings to receive comments on the draft EIR on:

**Tuesday, March 6, 2012, at 6:30 pm (Doors open at 6:00 pm)**
***Sanitation Districts of Los Angeles County***
1955 Workman Mill Road
Whittier, California

**Wednesday, March 7, 2012, at 6:30 pm (Doors open at 6:00 pm)**
***Carson Community Center***
801 East Carson Street
Carson, California

SANITATION DISTRICTS OF LOS ANGELES COUNTY

# No todos son millonarios

El presidente del Consejo Mundial de Boxeo, José Sulaimán, acompañado por el promotor estadounidense Don King y boxeadores, en conferencia de prensa con motivo de la celebración de 49 años del CMB. Foto: Alma Montiel/CMB.

BOXEADORES DEBERÍAN CONTAR CON PENSIÓN VITALICIA, CONSIDERA SULAIMÁN

Servicios de Impacto USA

Tiempo de recuerdos. De nombrar a los campeones más significativos en la historia y de enumerar los logros alcanzados por el Consejo Mundial de Boxeo (CMB) en 49 años.

El organismo mundial inició su año 50 de existencia, con un encuentro con algunos de los campeones del CMB y su presidente José Sulaimán. En este espacio, el dirigente se dio tiempo para reflexionar sobre los retos a futuro que tienen para mejorar el entorno del boxeo internacional.

"Lo que falta al boxeo actual es una pensión vitalicia para todos los pugilistas, porque es una pena que al final de sus vidas ellos solamente se acuerden del pasado, de las glorias de sus vidas, pero sin nada qué comer" dice Sulaimán.

El dirigente del Consejo Mundial, el cual fue fundado un 15 de febrero pero de 1963, recordó las reglas que ha impuesto el organismo para "humanizar" el boxeo. Tal es el caso de las peleas de campeonato a 12 rounds o los pesajes un día antes del combate y no el mismo día de la pelea.

Con la presencia de campeones vigentes como Jhonny González o Mariana Juárez, más leyendas del boxeo como "Pipino" Cuevas, Ultiminio Ramos o el promotor estadounidense Don King, Sulaimán expresó su deseo de unidad entre los organismos rectores del boxeo mundial.

"Nos faltan muchas cosas por cambiar. Tal es el caso de que haya unidad entre todos los organismos para que nos respetemos los unos a los otros y así evitar que los promotores continúen haciendo lo que les dé la gana", resaltó el presidente del CMB. -**Agencia El Universal.**

## INGENIERO

Viene de la página A1

responsable de la formación de depósitos de lípidos en las paredes de las arterias (arterosclerosis), y en la formación de aneurismas cerebrovasculares y abdominales aórticos.

Lasheras dijo que de joven su deseo de contribuir a la exploración del espacio fue una de sus inspiraciones para convertirse en científico, y reconoció como una de sus grandes influencias al también profesor español Amable Liñán Martínez, actualmente en las Universidades de Yale y Politécnica de Madrid.

"Comencé trabajando problemas de propulsión espacial y diseño de motores de cohetes para lanzamiento de satélites, en aspectos básicos de investigación con una aplicación práctica, desde los cuales mi trayectoria profesional me han llevado a la interface de temas básicos multidisciplinares en áreas tradicionales de la ciencia, concretamente la biología y la medicina", indicó.

Actualmente, Lasheras trabaja en colaboración con los profesores Richard Firtel y Juan Carlos del Álamo en el estudio de la mecánica del movimiento migratorio de células y en los procesos de invasión celular que aparecen en ciertas enfermedades inflamatorias crónicas y en cánceres metastáticos.

"Busco entender la mecánica de la migración celular, cómo se mueven las células en tu organismo, células como los leucocitos del sistema inmune que para cubrir su función necesitan migrar, salir de las venas y atravesar tejido para ir al foco de la infección", explicó.

"Desgraciadamente, las cancerígenas, cuando adquieren un fenotipo que les permite moverse, conducen a la formación de metástasis en interacciones complejas que si se pueden entender nos permitirán desarrollar fármacos o métodos para controlar el movimiento migratorio de células específicas", añadió Lasheras.

Autor o coautor de más de 100 artículos científicos y 44 patentes en EE.UU. relacionadas con el diseño de instrumentos médicos, Lasheras dijo estar convencido de que el siglo veintiuno será el siglo de la biología y la medicina, por lo que alentó a jóvenes a que se preparen para participar de sus avances.

Asimismo, destacó que se debe enfatizar el papel transformador de movilidad social de la educación, atacando las causas complejas de este problema desde la educación primaria, para aumentar la graduación de jóvenes hispanos en las universidades de élite.

"Haciendo trabajo voluntario en secundarias y preparatorias con mayoría hispana en San Diego he visto que la calidad de educación que reciben es muy diferente de aquella en zonas afluentes. Fundamentalmente los jóvenes son capaces de los mismos logros que cualquier otro grupo", dijo el investigador.

Además de mantener la cátedra como "Profesor Stanford y Beverly Penner de Ciencias Aplicadas" en la Escuela de Ingeniería Jacobs en UCSD, Lasheras también ocupa el puesto de "Profesor Distinguido de Ingeniería Mecánica Aeroespacial, y Bioingeniería", además de ser el director del Centro para Instrumentos Médicos e Instrumentación.

El profesor ha recibido numerosas distinciones profesionales, entre ellas el Premio F.N. Frenkiel para las Dinámicas de Fluidos de la Sociedad Física Americana en 1990 y la Innovación de Avance en Ciencias Médicas de BIOCOM en 2003.

Y desde el pasado 9 de febrero pertenece a la Academia Nacional de Ingeniería, el máximo honor de esta sociedad de investigación que es una de las tres científicas más importantes en EE.UU. y es el segundo español se convierte en miembro de derecho de esta academia, tras Sergio Verdú en 2007. **EFE.**

# Regresan Vela y Jona al Tri, Nery sigue excluido

Servicios de Impacto USA

Nery Castillo fue el gran ausente de la lista que dio a conocer el técnico de la Selección Mexicana de Futbol, José Manuel de la Torre, de cara al choque que sostendrá el Tricolor el próximo 29 de marzo ante Colombia, duelo que se realizará en el Qualcomm Stadium de San Diego, California y que forma parte de la preparación de cara a las eliminatorias con miras a la Copa del Mundo 2014.

Aunque en algún momento se especuló el posible regreso del oriundo de San Luis Potosí, por la mente del cuerpo técnico no pasó la opción de llamarlo, pese al buen momento futbolístico por el que atraviesa con el Aris Salónica de Grecia. Trascendió que dicha ausencia se debe a los problemas que tuvo en su última convocatoria, donde tuvo un enfrentamiento con los periodistas, además de contratiempos internos que se presentaron durante su estadía en el seno del equipo.

El último encuentro que disputó Nery con la casaca nacional, fue el 5 de septiembre de 2009. El cotejo ante Costa Rica, y que fue correspondiente al hexagonal final, fue ganado por los verdes por pizarra de 3-0. Castillo jugó los últimos 30 minutos del encuentro e ingresó de cambio por Giovani dos Santos.

Trascendió que "El Chepo" quiere disciplina total en el equipo, y no dudará en dejar fuera a los futbolistas que considera conflictivos. De hecho, ya habló con Rafael Márquez para que haga grupo con el resto de jugadores, y evitar diferencias que puedan provocar un mal ambiente en el plantel.

El que regresó a la convocatoria fue Carlos Vela. Después de la fiesta que tuvieron en Monterrey en septiembre del 2010, y que le costó una suspensión de seis meses, el delantero de la Real Sociedad de España tuvo esporádicos llamados, en gran medida debido al irregular paso que tuvo por el viejo continente, pero en las últimas semanas ha recuperado su nivel.

Sobresale, de igual manera, el regreso de Jonathan Dos Santos. El jugador del Barcelona fue inhabilitado previo a la Copa América, por verse involucrado en una reunión en la que asistieron sexoservidoras. "Jona" se ha negado en varias ocasiones a vestir la casaca nacional aunque, en entrevista que se publicó en medios ibéricos, dijo que no tendría problema para representar a México.

Efraín Juárez, del Celtic y Pablo Barrera, del Zaragoza español, fueron ingresados en la lista pese a la poca actividad que han tenido en el viejo continente. Desde antes de que saliera Javier Aguirre del cuadro maño, Barrera no había tenido continuidad, mientras que Juárez tuvo más minutos, aún así, tuvo que regresar al futbol escocés.

La lista la completan: Giovani dos Santos del Tottenham de Inglaterra, Héctor Moreno del Espanyol del Barcelona; Andrés Guardado del Deportivo La Coruña, Javier Hernández del Manchester United, Guillermo Ochoa del Ajaccio de Francia; Francisco Javier Rodríguez del Smargan de Alemania; además de Rafael Márquez, quien defiende la casaca del New York de la MLS.

Esta semana, se dará a conocer el resto de jugadores que militan en equipos mexicanos. Se esperan 20 convocados para el duelo con Colombia. -**Agencia El Universal.**

## CARNAVALES

Viene de la página A4

naval), cuando realizan una infatigable danza callejera desde la madrugada hasta el final de la noche, tiempo durante el cual no pueden sentarse en público.

Ese día, los gullles estrenan sus famosos sombreros realizados con trescientas plumas de avestruz y desfilan cubiertos con una máscara de cera que simboliza la igualdad entre las personas. Calzados con zuecos de madera, están vestidos con una blusa y un pantalón decorados con decenas de estrellas, leones y coronas. La blusa está forrada de paja lo que les confiere un aspecto tan caricaturesco.

En el Domingo de Carnaval los Guilles, marinos, pierrots y arlequines desfilan por las calles de la ciudad, bailan y exhiben sus espectaculares trajes. Todas las noches se realizan castillos de fuegos artificiales y las calles se llenan de confetis que la gente arroja.

El origen de estos personajes procede de una celebración en donde María de Hungría (Dama de Binche), con la intención de impresionar a su hermano Carlos V y a su hijo, Felipe II, organizó siete días de banquetes, fuegos artificiales, desfiles y bailes. La visita del monarca y su hijo estuvo acompañada por una misión de exploradores españoles tras el descubrimiento de América, por lo que, para celebrarlo, los caballeros de la corte española se disfrazaron de incas. **EFE-REPORTAJES.**

## IN17-NBA

Viene de la página A6

Yao Ming nació en Shanghái, China y fue el jugador más alto de la liga, pese a la idea que se tiene de la baja estatura de los chinos.

A sus 13 años Ming ingresó a las fuerzas juveniles del equipo Sharks de Shanghai y practicaba más de 10 horas diarias.

Los Lakers de Los Ángeles podrían dar otra sorpresa a la audiencia hispana local.

Al parecer hay interés en Gilbert Arenas y el domingo pasado fue su gerente general, Mitch Kupchak, el que lo observó durante una sesión privada de trabajo que realizó en Bel Air, de acuerdo a varias fuentes periodísticas.

Arenas regresó a su casa de Orlando y esperará a conocer la decisión que puedan tomar los Lakers, pero con la confianza que a nivel físico se encuentra completamente recuperado de los problemas de rodillas y caderas que le han afectado a través de todos los años de profesional.

Arenas, tres veces seleccionado al Partido de las Estrellas, tiene promedios de 21,2 puntos y 5,4 asistencias en los 10 años de carrera que lleva en la NBA.

Pero en la pasada temporada se quedó con un promedio de ocho puntos y un 34,4 por ciento de acierto en los tiros de campo después de haber disputado 49 partidos con los Magic de Orlando.

Si Arenas firma con los Lakers, el equipo angelino solo podría ofrecerle el mínimo del salario que corresponde a un jugador veterano, que es de 1,4 millones de dólares.

-**Con datos de Agencia El Universal, EFE y Wikipedia.**

## CANCHAS

Viene de la página A6

2011 fue el líder general del torneo. En la Copa Libertadores, de la que fueron finalistas en 2010, Chivas registró un empate en casa en su primer partido contra el Deportivo Quito ecuatoriano. ¿Explicaciones?, si se trata de eso. "Lo más importante ahora es recuperar la alegría, que los jugadores adquieran nuevamente esa confianza, porque futbolísticamente estamos bien", declaró Ambriz el sábado pasado tras sumar la quinta derrota, por 2-1 contra el Monterrey. Para los Pumas, las cosas son solo un poco diferentes. Con tres derrotas en seis partidos, dos empates y un triunfo para cinco unidades, el equipo, campeón en el Clausura 2011, se ve desorientado y sin un líder en la cancha. Los "felinos" son uno de los cuatro equipos mexicanos que jugarán los cuartos de final de la Liga de Campeones de la Concacaf junto al Morelia, el Santos y el Monterrey. Su serie la jugará contra el Isidro Metapán salvadoreño desde el próximo 8 de marzo... Cruz Azul no pudo cerrar una semana ganadora. Al final pidió la hora para lograr el empate a cero goles frente a los Xolos, en juego disputado en un repleto estadio Caliente de Tijuana... Jugaron una "cascarita" donde la vida es más sabrosa: México se impuso a Estados Unidos por 2-1 para adjudicarse el título del torneo de fútbol playa Cancún 2012 que se celebró con la participación de los equipos de El Salvador y de España. El Salvador derrotó por 3-2 a España en el primer juego de la jornada dominical para conquistar el segundo lugar del campeonato; España fue tercero y Estados Unidos, cuarto... Chiames sobre la cancha: Indignado, aturdido, sorprendido, Cuauhtémoc Blanco aún escucha los gritos provenientes de la tribuna del Sergio León Chávez, donde hace unos meses era ídolo y señor. "¡Ra-te-ro, ra-te-ro!", expresaron los fanáticos, el sábado pasado, cuando el ahora refuerzo de Dorados de Sinaloa visitó La Fresópolis, donde cayeron 1-0, en choque de la Liga de Ascenso. ¡La razón? Un día antes, la directiva del Irapuato manejó ante los medios locales que no existía ningún adeudo con él, y la afición se le reprochó a Temo su reclamo. "Tendré muchas cosas que me puedan criticar, menos la de ratero, como gritaban algunos aficionados en el estadio", estalló el futbolista, luego de revelar que el Irapuato le debe casi un año de salarios, más primas e intereses, suficiente para desarticular la franquicia fresera y dejarla sin futbol. "Es muy importante que sepa la afición de Irapuato, que este torneo, el equipo está jugando, en cierta forma, por permisión de mi parte difiriendo la deuda una semana más, ya que si hubiese dado mi negativa, no habrían podido participar en la Liga", aseguró "El Temo", molesto por el manejo que le ha dado la directiva al asunto... Luego de la suspensión de cinco partidos por mostrar dos tarjetas amarillas al mismo tiempo en la final del torneo pasado, el árbitro Marco Antonio "Chiquimarco" Rodríguez volvió a tomar su silbato y hizo bien portado. Su regreso a las canchas en el duelo Pumas-Puebla, disputado en Ciudad Universitaria, estuvo marcado por su buen desempeño, lejos de los arrebatos de protagonismo que lo suelen caracterizar. -**Con datos de EFE y Agencia El Universal.**


CLEARWATER Program

**AVISO DE AUDIENCIAS PÚBLICAS**

**Informe del Proyecto de Impacto Ambiental / Declaración de Impacto Ambiental**

Como parte de un esfuerzo de planificación integral llamado Programa Clearwater, los Distritos Sanitarios del Condado de Los Ángeles (Distritos Sanitarios) han completado un proyecto de Plan Maestro de Instalaciones (MFP, por sus siglas en inglés) para el Sistema de Desagüe Conjunto (JOS, por sus siglas en inglés), un sistema regional de manejo de aguas residuales que sirve a aproximadamente 4.8 millones de personas en 73 ciudades y áreas no incorporadas del Condado de Los Ángeles. El MFP evalúa las necesidades de infraestructura de JOS hasta el año 2050 y hace recomendaciones sobre cómo garantizar la continuación de JOS como un sistema de manejode aguas residuales seguroy economico, que proteja la salud pública y el medio ambiente.

El proyecto recomendado en el MFP incluye la construcción de un nuevo túnel de 7 millas de largo y 18 pies de diámetro para transportar las aguas residuales tratadas de efluentes de la Planta Conjunta de Control de la Contaminación del Agua en Carson hasta el Océano Pacífico de White Point. El nuevo túnel, que unirá a los desagües submarinos existentes en Royal Palms Beach, permitirá la inspección y reparaciones necesarias de los dos túneles ya existentes de flujo completo todos los días y que no han sido inspeccionadas en más de 50 años.

Los Distritos Sanitarios y el Cuerpo de Ingenieros de la Armada de los EE.UU. (Corps) han preparado un proyecto conjunto de Informe de Impacto Ambiental / Declaración de Impacto Ambiental (EIR/EIS) para el Programa Clearwater del MFP de conformidad con la Ley de Calidad Ambiental de California (CEQA, por sus siglas en inglés) y la Ley de Política Ambiental Nacional (NEPA, por sus siglas en inglés).

Las audiencias públicas se llevarán a cabo durante un periodo prolongado de 60 días de revisión pública del proyecto EIR/EIS, que termina el 10 de abril de 2012. El Programa Clearwater del MFP y EIR/EIS pueden verse en www.ClearwaterProgram.org.

Los Distritos Sanitarios y Los Corps llevarán a cabo una audiencia pública conjunta para recibir comentarios tanto del proyecto EIR y el proyecto EIS el:

Jueves 8 de marzo de 2012, a las 6:30 pm (Las puertas se abren a las 6:00 pm)
Crowne Plaza Los Ángeles Harbor Hotel
601 South Palos Verdes Street
San Pedro, California

Los Distritos Sanitarios llevarán a cabo dos audiencias públicas adicionales para recibir comentarios sobre el proyecto EIR el:

Martes 6 de marzo de 2012, a las 6:30 pm (Las puertas se abren a las 6:00 pm)
Distritos Sanitarios del Condado de Los Ángeles
1955 Workman Mill Road
Whittier, California

Miércoles 7 de marzo de 2012, a las 6:30 pm (Las puertas se abren a las 6:00 pm)
Centro Comunitario Carson
801 East Carson Street
Carson, California

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## ALVAREZ

From A1

crime to falsely claim a military honor. And Alvarez, once he was exposed, was convicted and fined $5,000. Sentencing has been held up while the appeal continues.

Today Alvarez is in state prison but not for that conviction. He was later convicted of defrauding the Three Valleys district when he registered his ex-wife for health benefits.

In the Supreme Court brief, Alvarez's lawyers acknowledged their client sometimes has trouble telling the truth.

"Xavier Alvarez lied," they declare in the first sentence of their Supreme Court brief and go on to recount six separate lies in the next few lines.

He lied when he claimed he played hockey for the Detroit Red Wings, married a Mexican starlet who made paparazzi swoon, was an engineer, rescued the American ambassador during the Iranian hostage crisis and was shot when he went back for the U.S. flag. Alvarez also lied, they said, when he talked about his military service.

But the lies Alvarez told harmed no one, they said, so what he did couldn't be considered fraud.

His lies, "though surely offensive," are still protected as free speech. They were "not obscene, defamatory or libelous," they argued, and did not defraud anyone of money."

They also offered a fallback argument to spare their client. He was a politician, they said, and politicians are known to shade the truth. When Alvarez spoke at the water board meeting, he did so as "an elected official at a public meeting." They said the First Amendment has always given its broadest protection to "political speech."

In defense of the law, U.S. Solicitor General Donald Verrilli Jr. says it "prohibits a narrow category" of false statements that tarnish the special status of military awards. Medals "convey the nation's gratitude for acts of valor and sacrifice," he said, and falsely claiming to have won such a medal is not just an inconsequential "white lie."

A three-judge panel of the 9th U.S. Circuit Court of Appeals in San Francisco struck down the law as an unconstitutional restraint on free speech and said the government might instead invest in an awards database that would make it harder for people to lay claim to medals they never won.

However, last month, the 10th U.S. Circuit Court of Appeals in Denver upheld the law in a separate case, saying the First Amendment does not always protect false statements.

*The Associated Press and Tribune News Service contributed to this report.*

## ROMERO

From A1

saddened by the unfortunate news of the passing of retired Police Chief Joe Romero. My thoughts and prayers go out to his family."

"He was the first Latino to make captain in the Pomona Police Department. He will be remembered for his life-long dedication and love for the city of Pomona," the statement said.

"He truly had a passion for our community and will be sorely missed."

In 2008, there was a controversy over the use of checkpoints that drew criticism from Councilwoman Cristina Carrizosa.

That same year, Romero objected to an account of his rise through the department in a campaign mailer for Mayor Elliott Rothman that gave the impression he had endorsed Rothman.

Rothman said Monday he had nothing to do with that mailer and had "a good professional relationship" with Romero.

There were times when they had saw things from different points of view.

"Those are minor disagreements that are gone and in the past," he said.

Romero's "career itself is stellar and speaks for itself," Rothman said.

"He was a dedicated officer who served the community for decades," Rothman said.

Romero, who retired in December 2008, was a popular police chief who was accessible and always willing to speak with residents.

People like former Mayor Eddie Cortez and Joe Romero "were men cut from the same cloth," said Pomona Unified School District Superintendent Richard Martinez.

"They are icons of Pomona. ... People who represent the best of our community. ... This is a huge loss."

Romero was someone who was interested in children and teens and was always available to support programs for youths, such as the department's Gang Resistance Education And Training Program, through which students learned problem-solving skills and ways to deal with challenging situations, Martinez said.

Romero had a way of quickly establishing relationships with children, even with the shy, introverted ones, said Virginia Madrigal, who began working with him in the mid-1990s and did so more intensely through the Community Engagement Group.

"He had a knack for talking to kids," she said.

"He felt they were our future. It was important to give them opportunities so they wouldn't end up dead in the streets."

He was also a supporter of the Boys & Girls Club of Pomona Valley, where he was a member of the board on various occasions.

At the time he fell ill last year, he was the club's vice president, said Victor Caceres, the executive director.

"He's someone who really cared about the kids," Caceres said.

Romero wanted the club's facilities to be the best they could for its young members and wanted the club to be operated in a professional and transparent manner, Caceres said.

"He was a great mentor for lots of kids and myself," Caceres said.

Romero wasn't afraid of doing what he felt was right, Caceres said.

"Sometimes people will get hung up on is (something) practical, or is it politically correct," Caceres said. Romero always looked at things differently.

He asked, "Is this the right thing to do? Is it the right thing for the kids? Is it the right thing for the community?" Caceres recalled.

As chief of police, Romero was well-regarded among the rank and file.

"He was loved and respected," said Sgt. Jaime Gutierrez, the president of the Pomona Police Officers Association.

He was open to new ideas, Gutierrez said. Sometimes they worked and sometimes they didn't, but he was always willing to try new ways of doing things.

Romero was also in favor of using technology whenever possible, Hunter said.

"He was the first who pushed technology to get information to the community," he said.

Romero was always willing to listen to his officers.

"He was very down-to-earth, and that helped with the lines of communication," Gutierrez said.

Even though he was chief, Romero was also willing to go out on sting operations and would dress as a homeless man or a drunk, which earned him the respect of personnel, he said.

"You usually didn't see management do that," Gutierrez said. "That was something only he did."

The rank and file saw that as a sign he was keeping up with what was going on on the streets and he knew what they faced, he said.

As a boss, Romero was fair, Gutierrez said.

"You knew where you stood with him. He expected the best of his officers," he said.

Romero was also creative.

It was his idea to turn the Civic Center Plaza into the scene of a campout in 2006 with the help of the Community Engagement Group, which consists of residents, members of law enforcement, business people, clergy and others.

The event drew 200 children for an evening of camping games, dancing, meeting young people from around the city and sleeping under the stars, all while interacting with members of the Police Department.

The free event has continued to take place every summer since, each year drawing hundreds of young campers.

"It was extremely important to him to be a chief that was active," Hunter said. "A lot of times chiefs have their hands full just being chief."

Yet somehow Romero found the time to develop a relationship between the community and the Police Department, he said.

Price said Romero was involved in various service organizations.

He was president of the Pomona Breakfast Optimist Club until becoming ill and as a member of Pomona Rotary was recognized as Rotarian of the Year in 2011, said Caceres.

Romero is survived by his wife, Carolyn Romero; two brothers, Michael and Timothy Romero; and a sister, Laurie Silva-Romero.

Funeral arrangements are pending.

[illegible]
909-483-9334

## GAS

From A1

in Fontana, knows a thing or two about how gas relates to pizza.

"It's frustrating, definitely," he said of rising fuel costs.

The problem goes something like this: gas price rises; delivery guy has to pay more at the pump; Arvanitis has to raise cost for delivery; customers consume less (or maybe they just make their own pizza); Arvanitis has to cut down on hours for delivery workers because there's less deliveries.

That's no knock on his pizza. It's the reality of the marketplace when gasoline shoots up.

"It's a chain effect," he said. "These gas companies are screwing with us."

By Memorial Day, gas prices could exceed the region's record average high, which occurred on June 22, 2008, when the price for a gallon of regular unleaded gas hit $4.61. If trends continue, we're already on our way to significantly higher prices.

Adam Gottlieb, a spokesman for the California Energy Commission, said California's recent price hikes have been fueled in part by the downtime that's occurring as refineries in the state convert from winter-grade to summer-grade gasoline.

### Gas prices in SB-Riverside-Ontario area

**(for a gallon of regular unleaded)**

- Monday: $4.034
- A week ago: $3.841
- A month ago: $3.717
- A year ago: $3.533
- Highest recorded average price: $4.614

Source: Automobile Club of Southern California

And the price of Alaska North Slope crude, which supplies about 14 percent of California's crude oil, rose about $4.50 over the past week.

"That alone translates to about 11 cents more for the price of gas," Gottlieb said.

It doesn't help that people — like commodities traders — are concerned about international events.

And right now they're fretting about a possible war in the Persian Gulf.

Oil prices are climbing after Iran said it will cut off crude exports to Europe in retaliation for a planned embargo later this year.

But even if nothing happens, the fear that something could happen may end up hiking oil prices anyway, said Ahmed Ispahani, a professor of business administration and economics at the University of La Verne.

"It has a psychological effect, so oil futures are bound to go up," Ispahani said.

Not exactly comforting news to Valerie Liese, who runs Jack Jones Trucking in Ontario.

She, too, is concerned about passing on rising costs of fuel to her customers, whose products travel long distances to get to the customer.

She'll walk into her business today and look at what the average price of diesel is in California and adjust accordingly.

"We have to pay like everybody else," she said.

So do her customers, who themselves are forced to adjust.

For instance, rather than ship out just a few orders in a truck from her fleet, they might hold on to the cargo for a day or two, so it won't cost as much to ship, she said.

Bottom line: The news of rising gas prices puts a dent in some recent good news about the economy.

Finally, Congress got around to passing a payroll tax credit. Too bad Liese's not going to see it.

"It's going to go into my tanks instead," she said.

[illegible]
909-386-3884

SAN DIMAS BENEFIT

# Show will benefit HEROES

By Imani Tate Staff Writer

SAN DIMAS — Fritz Coleman, the KNBC-TV weatherman, will don his comedic hat on March 10 and raise money to help fund the San Dimas HEROES Veterans Monument.

Coleman will headline the benefit at the San Dimas Civic Center's Stanley Plummer Community Building.

It begins with a 6 p.m. social hour, followed by the 7 p.m. show.

Jeff and Kimberly Bornstein will open for Coleman.

Tickets are $25 per adult, and all proceeds benefit the Helping Establish a Remembrance Of Every Serviceperson Project.

Military veterans from San Dimas, dating as far back as the Civil War, will have their names inscribed on the monument designed by Eddie Martinez Jr. of EM3 Group and under construction at the northwest corner of San Dimas Avenue and Commercial Street.

Seats are limited. Tickets may be purchased at sandimasheroes.org or by mail order to SD Heroes, P.O. Box 4216, San Dimas 91773.

The social hour will feature free refreshments and no-host drinks.

The evening of comedy will additionally include a live auction.

Donated items for the auction include a certificate for two people to ride on the Goodyear blimp, a ride on the Anheuser-Busch wagon pulled by the brewing company's famous Clydesdale horses during their May 4 visit to San Dimas and four tickets to a taping of "The Tonight Show."

The latter also features a personal tour of KNBC-TV's Burbank studio led by Coleman.

The San Dimas HEROES Project, co-founded by community activist Gary Enderle and businesswoman Janie Graef and involving community, business and school representatives as well as veterans, spearheads the creation of the veterans monument. The nonprofit group operating as a division of the San Dimas

COLEMAN

Community Foundation also led the campaign to establish a military banner program for local residents in the armed forces.

"Fritz had said he'd do a benefit comedy show for the San Dimas veterans monument several months ago, but his busy schedule had prevented him from finalizing the date until recently," Enderle said.

"To say we are thrilled by his enthusiasm and willingness to help is an understatement. He's not just a nice guy. He's a funny guy, so this show should be quite entertaining."

Coleman has become an iconic media man since he joined the KNBC-TV staff in 1982 as a weekend weathercaster.

Since 1984, Coleman has forecast the weekday weather on the 5, 6 and 11 p.m. broadcasts of the Channel 4 news editions.

He worked as a disc jockey and comedian in Buffalo, N.Y., for several years before moving to Los Angeles in 1980.

He devoted his first two years in California to stand-up comedy, performing at such clubs as The Improv and The Ice House and on "The Tonight Show."

Coleman has won four Emmy awards for his work on the NBC comedy specials and series "What A Week," "It's Fritz," "Fritz and Friends" and "The Perils of Parenting."

His communication skills also extend to writing, producing and starring in three one-man plays. His first production, "It's Me! Dad!," won the Artistic Directors Award.

Coleman, 63, won two Humanitarian of the Year awards from Shelter Partnership and the California Hospital Medical Center, in 2004 for his philanthropic and community service.

A third humanitarian honor was given him by the House of Representatives for his fundraising effort for the American Red Cross.

Kimberly and Jeff Bornstein, billed as The Bornstein Experiment, have performed throughout the United States and for armed forces shows in Iraq, Kuwait, Bahrain, Saudi Arabia, Japan, Korea and Germany.

Jeff is an actor, comedian, stuntman and magician who has entertained audiences since he was 12.

An Army veteran who served as a communications specialist, he volunteers and performs at Veterans Affairs hospitals.

Enderle said the community support of the local veterans monument has been "overwhelming."

The 30 project volunteers and friends from every age group have raised $190,000 to date for the monument.

"We've raised $22,000 just standing on the corner of Bonita Avenue and Arrow Highway and conducting Fill the Helmet collections.

"People put coins and bills in the helmet. One woman stopped traffic, got out of her car and came over to hug Carl Harstine," he said, smiling.

"Carl is the World War II Marine who, dressed in full dress uniform during our collections on the street and at community events, has become a symbol of courage and commitment for the project and community.

"The public response has not been limited to adults," Enderle noted. "Students, teachers and staffs at elementary, middle and high schools in San Dimas have raised funds. One little kid's mother drove him to the Fill the Helmet site because he wanted to drop the money from his piggybank into the helmet."

Senior citizens calling themselves "Friends of Sunnyside" because they live in the local retirement complex, made snowman pins, sold them for $3 each and donated the $700 sales proceeds to the monument.

The San Dimas HEROES Project volunteers and supporters feel veterans "who've served our country and protected our freedom should have a fitting remembrance," Enderle concluded.

CLEARWATER
Program

NOTICE OF PUBLIC HEARINGS

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Environmental Impact Statement*

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*Carson Community Center*
801 East Carson Street
Carson, California

SANITATION DISTRICTS OF LOS ANGELES COUNTY

R086433



## THIS DAY IN HISTORY

Today is the 52nd day of 2012.
There are 314 days left in the year.

**In 1862,** Nathaniel Gordon, captured at sea with nearly 900 Africans aboard his ship, the Erie, became the first and only American slave-trader to be executed under the U.S. Piracy Law of 1820.

**In 1885,** the Washington Monument was dedicated.

**In 1916,** the World War I Battle of Verdun began in France as German forces attacked; the French were able to prevail after 10 months of fighting.

**In 1925,** The New Yorker magazine made its debut.

**In 1945,** during the World War II Battle of Iwo Jima, the escort carrier USS Bismarck Sea was sunk by kamikazes with the loss of 318 men.

**In 1965,** black Muslim leader and civil rights activist Malcolm X, 39, was shot to death inside the Audubon Ballroom in New York by assassins identified as members of the Nation of Islam.

**In 1972,** President Richard M. Nixon began his historic visit to China as he and his wife, Pat, arrived in Beijing.

**In 1973,** Israeli fighter planes shot down Libyan Arab Airlines Flight 114 over the Sinai Desert, killing all but five of the 113 people on board.

**In 1992,** Kristi Yamaguchi of the United States won the gold medal in ladies' figure skating at the Albertville Olympics; Nancy Kerrigan of the U.S. won the bronze.

**Ten years ago:** The State Department declared that Wall Street Journal reporter Daniel Pearl was dead, a month after he'd been abducted by Islamic extremists in Pakistan. President George W. Bush failed to persuade China to halt sales of missile technology. In Salt Lake City, U.S. figure skater Sarah Hughes jumped from fourth to first to win the gold after a near-flawless performance, leaving teammate Michelle Kwan to settle for a bronze.

**Five years ago:** British Prime Minister Tony Blair announced his country would withdraw around 1,600 troops from Iraq in the coming months.

— The Associated Press

## LOTTERY

*Info? Call 800-568-8379*

**MONDAY**
**Daily 3 Midday:**
1, 0, 3

**Daily 3 Evening:**
6, 9, 7

**Daily 4:**
4, 1, 2, 0

**Fantasy 5:**
9, 14, 16, 25, 33

**Daily Derby:**
1st: 8, Gorgeous George
2nd: 1, Gold Rush
3rd: 12, Lucky Charms
Time: 1:47.83

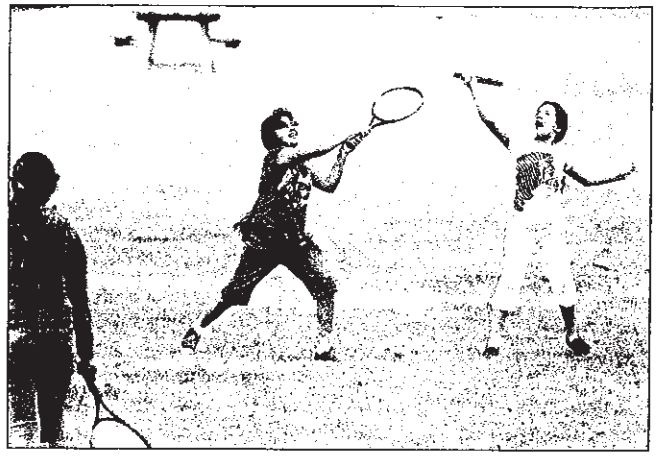
**SATURDAY**
**Super Lotto Plus:**
1, 19, 32, 41, 42

**Mega number:** 11

**Jackpot:** $13 million.
$14 million is up for grabs in Wednesday's game.

**What's a ticket worth?**

| | |
|---|---|
| Five numbers: | $10,313 |
| Four+mega: | $1,933 |
| Four numbers: | $126 |
| Three+mega: | $61 |
| Three numbers: | $11 |
| Two+mega: | $11 |
| One+mega: | $2 |
| Mega only: | $1 |



Sean Hiller Staff Photographer

**LONG BEACH.** SIBLING RIVALRY

Kaira Gaxiola, 12, left, watches her sisters Xochitl Castro, 10, center, and Karla Castro, 9, wield their rackets in a battle for the ball as they play at Recreation Park on Monday in Long Beach.

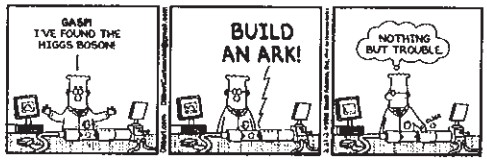
## TODAY'S BIRTHDAYS

Zimbabwe President **Robert Mugabe** is 88. Movie director **Bob Rafelson** is 79. Actor **Gary Lockwood** is 75. Actor-director **Richard Baymer** is 73. Actor **Peter McEnery** is 72. U.S. Rep. **John Lewis**, D-Ga., is 72. Film/music company executive **David Geffen** is 69. Actor **Alan Rickman** is 66. Actress **Tyne Daly** is 66. Actor **Anthony Daniels** is 66. Tricia **Nixon Cox** is 66. Sen. **Olympia J. Snowe**, R-Maine, is 65. Rock musician **Jerry Harrison** (The Heads) is 63. Actress **Christine Ebersole** is 59. Actor **William Petersen** is 59. Actor **Kelsey Grammer** is 57. Country singer **Mary Chapin Carpenter** is 54. Actor **Jack Coleman** is 54. Actor **Christopher Atkins** is 51. Rock singer **Ranking Roger** is 51. Actor **William Baldwin** is 49. Rock musician **Michael Ward** is 45. Actress **Aunjanue Ellis** is 43. Blues musician **Corey Harris** is 43. Country singer **Eric Heatherly** is 42. Rock musician **Eric Wilson** is 42. Rock musician **Tad Kinchla** (Blues Traveler) is 39. Actress **Jennifer Love Hewitt** is 33. Singer **Charlotte Church** is 26. Actress **Ellen Page** is 25. Actor **Corbin Bleu** is 23.

— The Associated Press

**TIM GROBATY**
... has the day off.

**DILBERT** Scott Adams

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## CLEARWATER Program

### NOTICE OF PUBLIC HEARINGS

*Draft Environmental Impact Report/ Environmental Impact Statement*

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801 East Carson Street
Carson, California

SANITATION DISTRICTS OF LOS ANGELES COUNTY

# CITY BEAT

£086433

ADVISORIES

## *72 phone scam re-emerges

An old phone scam is new again, and is leaving customers with high phone bills, according to the Los Angeles County Sheriff's Department. The scam begins when an unknown person calls a victim pretending to be a law-enforcement officer or medical personnel. The imposter tells the victim that his or her child or other loved one has been hurt in an accident or incarcerated. The imposter then tells the victim to call a law-enforcement agency or hospital for more information; the imposter gives a phone number that is preceded by *72.

By dialing *72 and the phone number, you have activated your call forwarding to the imposter's phone number. The imposter can then use your account to make collect or long-distance calls.

Do not make any calls to any phone number beginning with *72. If you do receive such a call, report it to your phone company or to the California Public Utilities Commission's consumer hotline at (800) 649-1570.

To check on your loved one, call the law-enforcement agency or medical facility directly.

## Comment period open

The draft environmental impact report for the Clearwater Program's master facilities plan is available for review through April 10. The review period began Feb. 10. Comments on the draft plan can be sent to: Steven W. Highter, Supervising Engineer, Planning Section, Sanitation Districts of Los Angeles County, 1955 Workman Mill Road, Whittier, CA 90601.

The master plan is for the joint outfall system, a regional wastewater management system serving approximately 4.8 million people in 73 cities and unincorporated areas in L.A. County.

The plan includes repairs of two 6-mile-long tunnels that run from the Joint Water Pollution Control Plant in Carson to the Palos Verdes Peninsula and Royal Palms Beach, and construction of a third tunnel to the existing ocean outfalls.

Potential significant impacts are: aesthetic impact of 30-foot barriers temporarily erected at JWPCP and Royal Palms; air quality and greenhouse gas impacts during construction; and cultural resource impacts brought on by disturbing or destroying unique paleontological resources during tunneling and shaft construction.

PALOS VERDES LIBRARY DISTRICT

## Trustees change meeting time

The Palos Verdes Library District board of trustees has decided to move the date of its regular monthly meeting to 7 p.m. on the third Thursday of each month beginning on March 15.

The change was suggested by newly elected trustee Debby Stegura, who noted that the only other elected body serving the Peninsula as a whole, the Board of Education, meets on the second and fourth Thursdays of each month creating a conflict for residents who might wish to attend the meetings of both bodies and making collaboration between the boards of the library and school districts more difficult.

Trustee meetings take place in the Community Room at Peninsula Center Library unless otherwise noticed. Agendas and minutes are available for viewing on the PVLD website at http://www.pvld.org/about/trustees/meetings.

## Living history

The third annual Living History Museum of African-American Heroes will exhibit at the Peninsula Center Library Community Room on Tuesday, Feb. 28 at 6 p.m. The library and its co-sponsors invite first- through eighth-graders to celebrate Black History Month by joining the fun. Participants will tell their heroes' stories by researching their lives and accomplishments. Then, at the Living History Museum, participants become their idol by wearing a costume and speaking to visitors to the museum as if they were the hero themselves.

For more information or to sign up to be a hero, call Young Readers Librarian Laura Henry at (310) 377-9584, ext. 206.

PALOS VERDES PENINSULA UNIFIED SCHOOL DISTRICT

## Decathlon's top scorer

The top individual scorer overall at the Los Angeles County Academic Decathlon was David Wang, a senior at Peninsula High School, who tallied 8,357 points out of a possible 10,000. He was followed by Lisa Beckmann, a West High School senior who scored 8,273 points, and Luke Murphy, a Redondo Union High School sophomore who scored 8,168.

Other top scorers from Peninsula were: Jessie Chen, second place, Honors; Rachel Tsaney, third place, Honors; Moonol Choi, first place, Varsity; Amie Kim, second place, Scholastic. Wang also took first place, Honors.

The team also includes Isobel Farias, Simon Feng, Christine Jung, Brian Kim and Christine Rowghani.

CITYBEAT A3

# The Bernina Express is train travel paradise for 45 minutes

By John Clayton
Special to the News

JOHN CLAYTON
TRAVEL WITH A DIFFERENCE

What's the most magically memorable train trip you've ever taken?

Mine was a few years ago when I rode the Bernina Express in sunny, snow-laden Switzerland on the Bernina line section that runs from St. Moritz to the charming Italian town of Tirano. Although the entire journey is a train lover's nirvana, I thought the most mesmerizing section was the 45-minutes from Pontresina to Poschiavo. During the fascinating trip to the top of the Bernina Pass you'll discover a marvelous mix of landscapes that is bewitching and totally captivating. So much so, that it made me want to constantly jump off of the train and sample the beguiling beauty before me.

Some of the areas that slipped slowly by, reminded me of a Scottish Moor, where rocks are strewn here and there, as if thrown around higgledy piggledy by some giant mad at the world – then, as all that seemed to disappear in a momentous moment, I got the feeling that it was as if this was a multi-scene stage play where there are constant scene changes in front of you – and you wonder how they do it so fast. To validate that, in the next second I saw a herd of sleepy looking brown cows grazing in a field so fresh, green and

Double the fun! When you reach the last part of your journey, you go over, under and around the Brusio Viaduct. If you get your seat at the back of the Bernina Express, you'll be able to photograph the train as it doubles back on itself. Here, we are just about to go under a section of track that we passed seconds before.

serene, I felt sure it must have been either a make-believe movie set, or that it had been painted by some great Italian artist. I'd hardly been able to digest all this peaceful serenity, when my eyes became riveted to the sight of seemingly countless rushing, crashing streams and waterfalls that dot the mountain scenery.

The hilly, towering craggy peaks in the background were, the day I rode it, ablaze with whiter than white snow sparkling like a thousand and one diamonds in the morning sunlight. While all this stunning scenery does indeed captivate the senses, the other fact that amazes virtually everyone who enjoys this incredible train trip, is that as steep as it is, there are no rack and pinion sections of the track. Brilliant Swiss railroad engineers designed it so skillfully that this type of track was not needed. You appreciate that fact when you arrive at the 7,400-foot level and the train comes to a halt at the Alp Gum station. Should you wish to do something really different, get off and engage in some challenging and exciting hiking.

The train then descends into the Poschiavo Valley on the other side, where sweeping vistas of lakes, snow and verdantly green and virgin-looking forests gripped my visual senses – and I wondered how Mother Nature was able to come up with so many amazing sights. Certainly the most eye-popping, is when the train twists and turns and doubles back on itself, as it traverses the Brusio Viaduct – a superb place for photo buffs to photograph this amazing train many times over. Just be sure you're in one of the carriages that allow you to open the window. See all this magic yourself at www.rhb.ch or visit Google and search Bernina Express for a variety of websites about this Swiss super train. Also visit My Switzerland.com.

When the train finally arrives in the Italian town of Tirano, you are suddenly confronted with the reality that the train ride of your lifetime has ended. If you never take another trip anywhere, I urge you to visit Switzerland and enjoy this most fantastic of all trains.

John Clayton is a Redondo native.


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SANITATION DISTRICTS OF LOS ANGELES COUNTY

R036433

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Page: A5 Edition: SG - PASADENA - 5 - 02/21/12
CYAN MAGENTA BLACK



# Montebello considers team-building deal

## Personality conflicts on council spur idea to focus on goals

By Ben Baeder Staff Writer

MONTEBELLO — A City Council marked by shouting, 10-minute diatribes and bitter disagreements is considering hiring a team-building company to help council members get along.

The council is scheduled to decide on the proposal at Wednesday's meeting.

Personality conflicts aside, the city cannot afford to go without goals and a concrete economic strategy because of infighting, said Mayor Frank Gomez, who proposed hiring a team-building firm.

And while at least one council member is balking at the cost of the exercise — more than $7,000 — Gomez said city finances are a big reason greater cooperation is necessary.

"I don't think you should be living from paycheck to paycheck," Gomez said. "It's not good for a city to live that way."

If anything, the team-building will help the council take an honest look at the city's finances and move forward with spending priorities in mind, Gomez said.

"We need to make goals, stick to them and not let them get pushed aside," he said.

The team-building workshop would be designed to build trust, set goals, find common ground and identify obstacles, according to a report prepared for Wednesday's City Council meeting. It would be open to the public and take place within the next few months.

In general, the council votes 4-1 on controversial spending issues, with Councilwoman Christina Cortez dissenting.

But Gomez said the problems in Montebello go much deeper than any disagreements with Cortez.

"Our group of five, and previous councils, have found it difficult to work together," he said. "And it's kind of endemic to Montebello, and it has been for years."

The city's staff has recommended hiring RJA Management Services of Arcadia to coordinate team building and goal setting.

RJA's bid came in at $7,105.

Cortez in January voted in favor of taking bids for team-building, but on Monday she wondered if the council should be spending the money.

The city should stop all new spending and build up reserves, she said. After spending in deficits for years, Montebello this year is operating on a razor-thin $600,000 surplus in its $44 million budget.

The time would be better spent going over finances, instead of in a team-building workshop, Cortez said.

"Now I think we should just save our money," Cortez said. "And we should look at ourselves professionally as a council and start acting like professionals."

Cortez, who was re-elected in November after first winning a seat in a 2010 recall election, has become the odd woman out at council meetings.

On Feb. 8 Cortez, who is mayor pro tem, started a meeting while Gomez stood in the hallway talking with other city officials. Cortez said Gomez was taking too long to start the meeting.

A clearly flustered Gomez hustled to his seat and explained he was having an important conversation that couldn't wait.

Cortez a few minutes later said she wasn't comfortable with some of the discussions they were having in closed session regarding City Attorney Arnold Alvarez-Glasman.

Gomez tried to get her to be quiet, and then the rest of the City Council jumped into the Pledge of Allegiance while Cortez was still talking.

Cortez said she is frustrated by what she said are constantly changing budget numbers, pointing out that the Secretary of State, the U.S. Department of Housing and Urban Development and the FBI have all launched investigations into Montebello's finances.

RJA Management Services President Richard Garcia said there is no denying that lack of trust and fundamental disagreements are often part of city politics.

"You have to agree to disagree," Garcia said. "That's just respect."

But members of a council will likely have basic things in common, too, he said.

"You're going to find areas where they do agree," he said. "And you have to focus on that."

Ideally, a facilitator will diagnose the disagreements and then figure out what options are in play, he said.

As for Gomez, he said $7,105 is a small price to pay to start building a strategy.

"This has to be better," he said. "There really is no option."

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# Making the town bike-friendly

## Youth group helps with Baldwin Park's goal of safe streets

By Maritza Velazquez
Staff Writer

Watchara Phomicinda Staff Photographer

Eric Avila, left, Jorge Rodriguez, both 13, ride their bikes near the Danza Indigenas monument in Baldwin Park on Thursday evening. Cyclertopia, a youth leadership group, has been instrumental in bringing more bike-friendly policies to Baldwin Park.

BALDWIN PARK — A generation of children regularly choosing television, video games and computer screens over outdoor activities, contributes to a nationwide obesity epidemic.

But Baldwin Park officials want to change that. They say the first stepis to create a safe environment for pedestrians and bicyclists.

The concerns prompted councilmembers in August to pass a Complete Streets policy, a comprehensive set of guidelines that ensure that all new construction and improvements to city streets are made to better accommodate those who bike and walk in Baldwin park. The policy was facilitated through a $240,000 federal grant. Now local youths are joining in on the effort.

The Baldwin Park Cycler Leadership Pilot Program, funded by the California Center for Public Health Advocacy, presented the City Council last week with results of a bike audit, which provided an assessment of unsafe biking conditions in the community.

As part of the assessment, the youths recommended various changes and upgrades to city streets that could be made in the implementation of the Complete Streets policy.

"In support of (the Complete Streets) policy, our goal was to have these kids get involved with a street assessment and street audit so they can provide their perspective on what should be upgraded, improved upon and how we can build upon the capacity of the streets," said Javier Hernandez, who leads the program.

City staff and roughly a dozen youths embarked on an 8.5-mile route through city streets to evaluate signage, road conditions and traffic challenges in the area, stopping at four different locations to log their findings.

"These kids gained empowerment," Hernandez said. "They now have an understanding of the process when a city takes into account community input. They also have a greater understanding of the rights of cyclists in general."

The group discovered that several bicycle route signs were covered by trees and bushes, that Olive Street doesn't have bike lanes, through it does have the space for them and Clark Street is too narrow for bicycles to safely travel alongside traffic.

Vanessa Escalante, 15, participated in the bicycle audit and said she hopes that one day Baldwin Park can be as bike-friendly as communities such as Long Beach, where bicycle lanes are wider and safer than in Baldwin Park.

"I hold Baldwin Park to that same standard," the Baldwin Park High School student said. "I enjoy going everywhere on my bike, but when there are no bike lanes, I'm kind of limited to where I can go."

City officials hope that the improvement of city streets will help improve the overall health of residents, especially amid an obesity epidemic that now classifies 17 percent of the nation's youth and 33 percent of the country's adults as obese, according to the Centers for Disease Control and Prevention.

"It's all based on encouraging residents to walk more, use bicycles to get to different destinations and to create safer routes for them and children to feel safe to use the streets for a transportation mode," City Councilwoman Marlen Garcia said.

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# CLEARWATER Program

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1955 Workman Mill Road
Whittier, California

**Wednesday, March 7, 2012, at 6:30 pm (Doors open at 6:00 pm)**
*Carson Community Center*
801 East Carson Street
Carson, California

SANITATION DISTRICTS OF LOS ANGELES COUNTY

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CYAN MAGENTA BLACK



## AROUND THE VALLEY

LA VERNE

### Bonita High students will perform at Fox Theater

The Bonita High School Jazz Ensemble will bring the sounds of the Big Band Era to Pomona's Fox Theater next month as part of a fundraising effort.

The Jazz Ensemble will be accompanied by the Bonita High Chamber Singers for their annual "Swingin' with the Big Bands" gala March 2.

The event begins at 6 p.m. with a social hour and a non-alcoholic bar, followed by a catered dinner, and then music and dancing.

A silent auction and raffle drawings will be held throughout the evening.

Tickets to the event can be purchased online at shop.lvbba.org. Prices start at $25. All proceeds benefit the Bonita High School band and color guard.

DIAMOND BAR

### Public invited to take tour of new City Hall

The community is invited today to take a tour of Diamond Bar's new City Hall, which officially opened for business last month.

The opening marked the first time in its 22-year history that the city is operating from its own building.

Employees formerly worked out of a South Coast Air Quality Management District complex that the city shared with the agency.

Diamond Bar purchased its new building at 21810 Copley Drive in September 2010 with the dual goal of addressing space needs for city operations and creating a new home for the nearly 40-year-old library branch.

The building's first floor and future library site will not be open for tours today because it is still under construction. Completion is expected this summer.

With 27,000 square feet of space, the second floor houses all city government service functions, a team of Los Angeles County Sheriff's Department personnel and an Emergency Operations Center. It also features a large public service counter and several meeting rooms.

City Hall's open house will take place from 4 to 6:30 p.m. today. For more information, contact Diamond Bar's public information office at 909-839-7055.

ROSEMEAD

### Talent show auditions scheduled for youths

Youths ages 12 to 18 are invited to audition for the 11th Annual Got Skills! Talent Show set for May 11. The event serves to promote the idea that youths can have fun without alcohol, tobacco and other drugs.

Auditions for musicians, dancers, actors, poets and other artists will be held from 3:30 to 5 p.m. March 14 and from 3:30 to 6 p.m. March 20 and 29. They will be held at the Asian Pacific Family Center clubhouse, at 9353 E. Valley Blvd.

There will be raffle prizes for attendees and cash prizes for contestants — First Place $200; Second Place $100; Third Place $50.

To register for an audition date or for more information, contact Nancy Trinh at 626-287-2988, ext.154 or sgvandyouthcouncil@yahoo.com.

From staff reports

# Rusnak exec running for Assembly

## Car dealership president enters 41st District race

By Brian Charles Staff Writer

RUSNAK

PASADENA — Victoria Rusnak, the president and chief counsel of the Rusnak car dealership, has thrown her hat in the ring for the 41st Assembly District race.

Rusnak, a Democrat who filed papers to run last week, said her campaign will focus on business growth and expanding educational opportunities for residents in the district, which stretches from Pasadena to Rancho Cucamonga and includes Monrovia, San Dimas and Claremont.

"As a business person, I want to offer some alternatives to what we are hearing in Sacramento, focusing on the economy, education and the environment," Rusnak said. "We have to find solutions to help business grow, so they can get capital ... expand and hire."

Rusnak, who has been involved in nonprofit work ranging from Ronald McDonald House to the Armory Center for the Arts, entered a crowded field seeking the seat.

Pasadena Councilman Chris Holden and South Pasadena Mayor Michael Cacciotti join Rusnak as Democrats in the race. On the Republican side, Tea Party activist Donna Lowe of Claremont has declared she is running.

All four will find themselves in an open primary battle in June. The top two candidates, regardless of party, will advance to the November general election.

Rusnak graduated USC, earned her law degree from Gonzaga University and has a master's degree from George Washington School of Law, has worked for the Sierra Club Legal Defense Club in Washington, D.C., and spent time with the National Oceanic and Atmospheric Administration.

Rusnak insists that her experiences "are not mutually exclusive" but remained tight-lipped about the exact point where her interests intersect.

"You have to balance the needs of business and the economy with protecting the environment," she said, promising to address the issue more specifically during her campaign.

As the region crawls back from the recession, Rusnak said educating residents will play a vital role in the recovery. Her emphasis remains on supporting teachers and not institutions.

"We need to make sure we are compensating our teachers," she said. "We need begin fueling teachers rather than bureaucracies."

Rusnak enters the race six months after Holden and nearly two months after Cacciotti but said she remains confident that she can perform well against the two seasoned politicians.

"I see mediocrity in the candidates and their unwillingness to make hard choices," Rusnak said. "They need to be willing to cut where necessary and be willing to spend where it will benefit the state in the long term."

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### Tribune on vacation

Beulah Graham and Barbara Roddy of West Covina take the Tribune to Lunenburg, Nova Scotia, part of which is an UNESCO World Heritage Site.

*Take a photo with the San Gabriel Valley Tribune at a landmark. Identify those pictured by name and hometown. Mail to 1210 N. Azusa Canyon Road, West Covina, CA 91790, or email the image in JPEG format to news.tribune@sgvn.com. Send a copy, because photos can't be returned.*

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SANITATION DISTRICTS OF LOS ANGELES COUNTY

# AROUND WHITTIER

MONTEBELLO

### Lecture today will cover heart health

Beverly Hospital is offering a free lecture about heart health at 2 p.m. today in the hospital's Tower Basement Rooms, 309 W. Beverly Blvd.

The discussion will cover heart disease, risk factors and lifestyle changes necessary to lower risk.

Learn how to boost your metabolism while lowering blood pressure and cholesterol.

The presentation will be given by Gary F. Rivas, a clinical dietitian at the hospital.

For information or reservations, call 800-618-6664.

WHITTIER

### Granada Middle School sets fundraiser at KFC

Granada Middle School will host a KFC fundraiser from 4 to 9 p.m. today at KFC, 16161 Leffingwell Road.

Granada will receive 20 percent of all pre-tax sales when KFC is presented with a fundraiser flier.

To download a flier, visit www.facebook.com/kfcsocal or http://ewcsd.org/schools/granada.

For more information, contact Lorie Bliss at nicsroom@verizon.net or Richard Hopkins at rhopkins03@verizon.net.

WHITTIER

### Public library sets silent book auction

Whittier Public Library is conducting its silent book auction for the month of February.

The following books are available:

- "The Beth Book" by Sarah Grand
- "Whittier's Poems" by John Greenleaf Whittier
- "Citas del Presidente Mao Tsetung"
- "The Song of Our Syrian Guest" by William Allen Knight
- "The Bumble Bee Prince" by Saul Lancourt
- "The Second World War," six volumes by Winston S. Churchill, minimum bid: $50
- "The Complete Tales of Winnie-the-Pooh" by A.A. Milne, minimum bid: $15

The books are displayed in the library's entrance and bidding will close Feb. 29.

Auction proceeds are used for the purchase of library materials, equipment and activities, such as special children's programs and after-school activities.

For information, call the library at 562-567-9900.

PICO RIVERA

### American Legion will serve dinner fundraiser

American Legion Auxiliary Unit 341 will host a fish fry dinner at 4 p.m. Thursday at its post, 4909 S. Durfee Ave.

Dinner will include creamed spinach, corn, salad and dessert.

The cost is $6 per plate.

Live entertainment will be provided by DJ Carlos.

For more information, call the post at 562-695-1558.

LONG BEACH

### Whittier resident receives Cal State scholarship

Whittier resident Amanda Erin Aguilar, a nursing major at Cal State Long Beach, won a $2,000 scholarship for an essay in "BrainTrack," a worldwide university and college directory.

Her essay gives advice about studying, entering a nursing program, and preparing for a nursing career.

For information, call CSULB's office of public affairs at 562-985-4134.

WHITTIER

### AAUW to honor 'Las Distinguidas'

Nominations are being sought by the Greater Whittier Branch of the American Association of University Women for the Las Distinguidas award, to be presented in April.

The awards are given to women who have made significant contributions in business, the arts, education, community service, politics or a profession.

The deadline for nominations is Feb. 29.

For information, contact Gwen Woirbaye at 562-696-6405 or gwen@woirbaye.com.

*Send submissions for "Around Whittier" to news.wdn@sgvn.com.*

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## Daily News on vacation

Top row, from left, Dawn McCaffer, Nick McCaffer, Chuck Giesler, Carolyn Giesler, Amy Abell, Joe Abell and Grady Abell, and, bottom row, Ryan Abell, Gavin McCaffer and Austin Abell of Whittier take their hometown newspaper to The Polar Express in Williams, Ariz.

*Take a photo with the Whittier Daily News at a landmark. Identify those pictured by name and hometown. Mail to Tim Traeger, 7612 Greenleaf Ave., Whittier, CA 90602, or email the image in JPEG format to news.wdn@sgvn.com. Send a copy, because photos can't be returned.*

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# SENIOR NOTES

REGION

### Complimentary activities on behalf of CareMore

Enjoy a complimentary movie from noon to 3 p.m. today at La Mirada Starplex, 15269 Rosecrans Ave.

Complimentary haircuts will be given from 11 a.m. to 3 p.m. Wednesday at Haircrafters, 2070 W. La Habra Blvd.

Ivy Nails, 10255 Colima Road #1, in Whittier, will offer complimentary hand spas from 10 a.m. to 1 p.m. Wednesday, Feb. 29.

Friendly Hills Barber Shop, 15236 Whittier Blvd., will give haircuts Thursday.

For information, call CareMore at 877-211-6614 or visit www.caremore.com.

WHITTIER

### Coffee, bingo offered for seniors at St. Gregory's

St. Gregory's Senior Center, 13935 Telegraph Road, meets from 9:30 a.m. to 1:30 p.m. Mondays.

Meetings include coffee and doughnuts, five games of bingo, five games of 50-50, a raffle, and birthday and anniversary celebrations.

Once a month, the senior center offers a potluck.

Membership is open to seniors 55 years and older.

For more information, contact Manuel Guerena, president, at 562-946-2098 or Gil Aguinaga, chairman, at 562-698-4450.

WHITTIER

### Palm Park seniors scheduled to take trips

Palm Park seniors presents its 2012 Pac N Go tours beginning with "Gastronomy and Gaming" on March 7.

The event includes a Grandiose Gourmet luncheon, deluxe transportation to Santa Barbara and a trip to Chumash Casino.

The cost is $60 per person.

The club is also offering "Rail Fest at Fillmore" on March 24.

The event will include a ride aboard a vintage Fillmore and Western Railway, lunch and arts-and-crafts booths.

The cost is $70 per person.

Reservations are required.

For information or registration, contact Lydia Juarez at 323-728-3881 or Delia Romero at 323-728-7748.

LA MIRADA

### Half Century Club will visit San Manuel Casino

The La Mirada Half Century Club will visit San Manuel Casino on March 14.

The cost is $8 per person.

The club will also visit Laughlin from April 10-12.

The cost is $108 per person, double occupancy; or $125 per person, single occupancy.

Two buffets are included with payment.

Trips are scheduled to leave from La Mirada Activity Center, 13810 La Mirada Blvd.

For information, contact Pam Shields at 562-947-7064.

*Send submissions for "Senior Notes" to news.wdn@sgvn.com*

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### *Draft Environmental Impact Report/ Environmental Impact Statement*

As part of a comprehensive planning effort called the Clearwater Program, the Sanitation Districts of Los Angeles County (Sanitation Districts) have completed a draft Master Facilities Plan (MFP) for the Joint Outfall System (JOS), a regional wastewater management system serving approximately 4.8 million people in 73 cities and unincorporated areas of Los Angeles County. The MFP evaluates the infrastructure needs of the JOS through the year 2050 and makes recommendations on how to ensure the continuation of the JOS as a reliable and cost-effective wastewater management system that is protective of public health and the environment.

The recommended project in the MFP includes the construction of a new 18-foot diameter, 7-mile long tunnel to convey treated wastewater effluent from the Joint Water Pollution Control Plant in Carson to the Pacific Ocean off of White Point. The new tunnel, which would tie into existing ocean outfalls at Royal Palms Beach, would allow for inspection and any necessary repairs of two existing tunnels that flow full every day and have not been inspected for over 50 years.

The Sanitation Districts and the U.S. Army Corps of Engineers (Corps) have prepared a joint draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Clearwater Program MFP pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). Public hearings will be conducted during the extended public review period for the draft EIR/EIS, which ends on April 10, 2012. The Clearwater Program MFP and EIR/EIS can be viewed at www.ClearwaterProgram.org.

The Sanitation Districts and the Corps will hold a joint public hearing to receive comments on both the draft EIR and draft EIS on:

**Thursday, March 8, 2012, at 6:30 pm (Doors open at 6:00 pm)**
*Crowne Plaza Los Angeles Harbor Hotel*
601 South Palos Verdes Street
San Pedro, California

The Sanitation Districts will be conducting two additional public hearings to receive comments on the draft EIR on:

**Tuesday, March 6, 2012, at 6:30 pm (Doors open at 6:00 pm)**
*Sanitation Districts of Los Angeles County*
1955 Workman Mill Road
Whittier, California

**Wednesday, March 7, 2012, at 6:30 pm (Doors open at 6:00 pm)**
*Carson Community Center*
801 East Carson Street
Carson, California

SANITATION DISTRICTS OF LOS ANGELES COUNTY

## Appendix 3-A

# PROJECT CONSTRUCTION EQUIPMENT LIST

# Appendix 3-A
# PROJECT CONSTRUCTION EQUIPMENT LIST

**Table 1. Project Equipment List**

| Equipment | Description/Function |
|---|---|
| **Shaft Construction** | |
| Crane | A hoisting device used to lift, lower, and move laterally the heavy equipment and supplies into and out of the shaft |
| Excavator | A machine used to dig out and transport loose soils |
| Loader | Equipment used to load excavated soils, debris, and supplies into other machinery |
| Grader | Vehicle used to create a wide flat terrain surface |
| Water truck | Vehicle used to transport and diffuse water for dust control and soil compaction |
| Worker truck | Vehicle used to transport workers, parts, and equipment in and out of the shaft site |
| Concrete truck | Vehicle used to transport and mix the cement and aggregate used to form concrete |
| Dump truck | Vehicle used to transport excavated soils, debris, and other materials out of the site |
| Street sweeper | Vehicle used to for road cleaning and trash removal |
| **Tunnel Boring Machine Assembly** | |
| Crane | A hoisting device used to lift, lower, and move laterally the heavy equipment and supplies into and out of the assembly site |
| Fork lift | Vehicle used to transport heavier equipment and other supplies around the assembly site |
| Worker truck | Vehicle used to transport workers, parts, and equipment in and out of the assembly site |
| **Tunnel Construction** | |
| Crane | A hoisting device used to lift, lower, and move laterally the heavy equipment and supplies into and out of the construction site |
| Loader | Equipment used to load excavated soils, debris, and supplies into other machinery |
| Forklift | Vehicle used to transport heavier equipment and other supplies around the project site |
| Street sweeper | Vehicle used to for road cleaning and trash removal |
| Water truck | Vehicle used to transport and diffuse water for dust control and soil compaction |
| Worker truck | Vehicle used to transport workers, parts, and equipment in and out of the project site |
| Supply truck | Vehicle used to transport tunnel liner segments and other construction material to the site |
| Dump truck | Vehicle used to transport out and dispose the excavated and cut material resulting from tunnel construction and site preparation out of the site |
| Tunnel boring machine | A machine used to excavate tunnels through a variety of soils |
| Locomotive and railcar | Railway vehicle used to transport excavated soil, workers, and supplies through the tunnel |
| **Riser/Diffuser Assembly and Construction** | |
| Crane | A hoisting device used to lift, lower, and move laterally the heavy equipment and supplies into and out of the construction site |
| Forklift | Vehicle used to transport heavier equipment and other supplies around the assembly site |
| Worker truck | Vehicle used to transport workers, parts, and equipment in and out of the project site |
| Supply truck | Vehicle used to transport tunnel liner segments and other construction material to the site |

## Appendix 5-A
# FEDERAL CONFORMITY EVALUATION

# Appendix 5-A
# FEDERAL CONFORMITY EVALUATION

## Introduction

This conformity evaluation is in response to Impact AQ-5, which asks if the program/project would conform to the United States Environmental Protection Agency (EPA) -approved state implementation plan (SIP) and thus not exceed de minimis thresholds.

The general conformity rule ensures that federal actions comply with the national ambient air quality standards (NAAQS). In order to meet Section 176(c) of the Clean Air Act (CAA), a federal agency must demonstrate that every action that it undertakes, approves, permits, or supports will conform to the appropriate state implementation plan (SIP). The conformity evaluation ensures that projects using federal funds or requiring federal approval not (1) cause or contribute to any new violation of a NAAQS, (2) increase the frequency or severity of any existing violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other milestone.

The conformity evaluation is required for Alternative 4 (Project), the recommended alternative, for which a Department of Army permit from the United States Army Corps of Engineers (Corps) would be required (Corps 2011). A conformity analysis is not applicable to Alternative 4 (Program) because none of the program elements would require federal action. Both direct and indirect emissions must be considered in the conformity evaluation. The EPA considers direct emissions as emissions that are reasonably foreseeable and indirect emissions as those emissions that the federal agency can practically control and for which the agency has continuing program responsibility.

Figure 1 indicates in red those project elements that are subject to the Corps permitting authority. Based on guidance for the implementation of the General Conformity Rule for regulatory permits, dated April 20, 1994 (Attachment A), the Corps concluded that emissions from the construction of these elements would be considered as direct emissions in the general conformity evaluation. Under Alternative 4, project elements subject to the conformity evaluation include rehabilitation of the existing ocean outfalls, which are located seaward of the proposed Royal Palms shaft site. Once these project elements are rehabilitated, they in and of themselves would not generate additional air emissions as their sole purpose is to convey treated effluent into the marine environment. Therefore, there would be no indirect emissions associated with these project elements. Furthermore, the Corps permit is only applicable to construction activities. Upon completion of the rehabilitation, the Corps would not maintain a continuing program responsibility over these project elements.

The conformity evaluation process is subdivided into three phases: applicability analysis, conformity determination, and review process (Code of Federal Regulations [CFR] Title 40, Parts 51 and 93).

# Applicability

Applicability of the conformity programs is limited to areas designated as nonattainment under Section 107 of the CAA and maintenance areas established under Section 175A of the CAA. Therefore, only actions that cause emissions in designated nonattainment and maintenance areas are subject to the regulations. In the applicability analysis phase, the federal agency determines the following:

- Whether the action will occur in a nonattainment or maintenance area
- Whether one or more of the specific exemptions apply to the action
- Whether the federal agency has included the action on its list of "presumed to conform" actions
- Whether the total direct and indirect emissions are below or above the de minimis levels
- Where the facility has an emissions budget approved by the state as part of the SIP, whether the emissions from the proposed action are within the budget

40 Code of Federal Regulations (CFR) 93.153 defines de minimis levels for criteria pollutants based on area attainment status as presented in Table 1.

**Table 1. De Minimis Levels for Criteria Pollutants**

| Pollutant | Designation | Tons/Year |
|---|---|---|
| Ozone (precursors: VOC or $NO_X$) | Serious nonattainment | 50 |
| | Severe nonattainment | 25 |
| | Extreme nonattainment | 10 |
| | Other areas outside an ozone transport region | 100 |
| Carbon monoxide, $SO_2$ and $NO_2$ | All nonattainment and maintenance areas | 100 |
| PM10 | Serious nonattainment | 70 |
| | Moderate nonattainment and maintenance | 100 |
| PM2.5 | Direct emissions | 100 |
| Lead | All nonattainment and maintenance | 25 |
| Lead emissions were not evaluated in this assessment. Lead is not a chemical of concern for activities associated with this federal action. | | |

The federal action will occur in the South Coast Air Basin (SCAB), which is currently in extreme nonattainment for ozone, in serious nonattainment for particulate matter less than 10 microns in diameter (PM10), and in nonattainment for particulate matter less than 2.5 microns in diameter (PM2.5). Based on the present NAAQS attainment status of the SCAB, a federal action would conform to the SIP if its annual emissions remain below 100 tons of carbon monoxide (CO), 70 tons of PM10, and 10 tons of nitrogen oxides ($NO_X$) or volatile organic compounds (VOCs) (40 CFR 93.153). Since operation of the proposed project would not generate emissions of criteria pollutants, the de minimis thresholds apply to the proposed construction activities pertaining to the federal action for the preferred alternative. If the proposed action exceeds one or more of the de minimis thresholds, a more rigorous conformity determination is the next step in the conformity evaluation process.

Based on guidance for the implementation of the General Conformity Rule for regulatory permits, dated April 20, 1994 (Attachment A), the Corps concluded that construction activities subject to the conformity evaluation consist of construction activities associated with the rehabilitation of the existing ocean

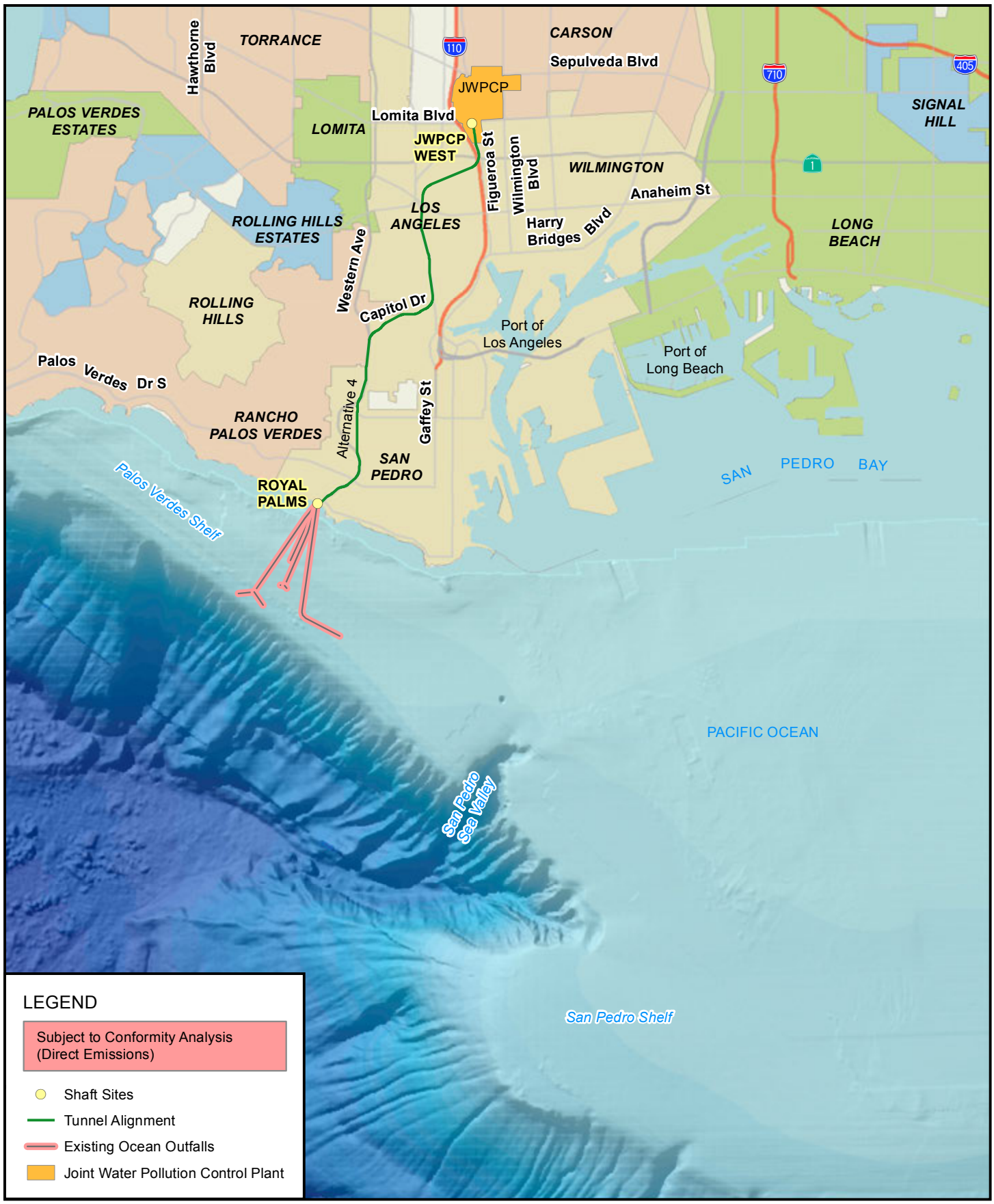


**FIGURE 1**

CLEARWATER Program

## General Conformity Scope of Analysis

Source: Sanitation Districts of Los Angeles County 2011

outfalls. The Corps has determined that all underwater and in-water activities are subject to conformity evaluation as these activities constitute actions subject to the Corp's permitting authority. The Corps has also determined that land-side construction activities at the Royal Palms shaft site are not subject to the conformity evaluation as these activities do not constitute actions subject to the Corps' permitting authority. Therefore, the conformity evaluation is limited to the underwater and in-water activities associated with rehabilitation of the existing ocean outfalls.[1]

Rehabilitation of the existing outfalls is scheduled for the 3rd and 4th quarters of 2019 and the 1st quarter of 2020. Exhaust emissions from tugboats, crew boats, and a service vessel comprise emissions associated with rehabilitation of the existing ocean outfalls. Chapter 5 discusses the methodology used to quantify emissions associated with these sources. Emissions associated with these sources are presented in Table 2.

**Table 2. Preferred Alternative: Criteria Pollutant Emissions Without Mitigation**

| | Annual Emissions (tons per year) | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **VOC** | **CO** | **$NO_X$** | **$SO_2$** | **PM10** | **PM2.5** |
| 2019 | 0.0 | 1.0 | 0.8 | 0.0 | 0.0 | 0.0 |
| 2020 | 0.1 | 1.9 | 1.5 | 0.0 | 0.0 | 0.0 |
| Maximum Annual Emissions | 0.1 | 1.9 | 1.5 | 0.0 | 0.0 | 0.0 |
| De Minimis Thresholds | 10 | 100 | 10 | 100 | 70 | 100 |
| Exceeds De Minimis Threshold? | No | No | No | NA | No | No |

# Conformity Determination

The applicability analysis shows that the action would not exceed de minimis thresholds and as such is not required to undergo a conformity determination.

# Review Process

As public entities, federal agencies must make their conformity determinations through a public process. This determination will undergo public review as part of the public review of the environmental impact report/environmental impact statement for the Clearwater Program.

# Conformity Statement

The applicability analysis shows that the proposed federal action would result in emissions of criteria pollutants below the de minimis thresholds. Actions that result in emissions below the de minimis thresholds are not considered by the EPA to cause or contribute to any new violation of a NAAQS, increase the frequency or severity of any existing violation, or delay the timely attainment of any

[1] Although the EPA excludes emissions over which the federal agency does not have a continuing program responsibility from the general conformity evaluation, this is not the case for National Environmental Policy Act (NEPA) review. The NEPA review in Chapter 5 considers actions underwater, in-water, and on land.

standard, interim emission reduction, or other milestone. Therefore, the proposed federal action will comply with the general conformity regulation.

# References

Corps (U.S. Army Corps of Engineers). 2011. Re: Clearwater EIS/EIR, Corps guidance on the General Conformity Analysis, e-mail to Steve Highter from Ken Wong, June 2, 2011.

**Attachment A**

# GUIDANCE FOR THE IMPLEMENTATION OF THE GENERAL CONFORMITY RULE FOR REGULATORY PERMITS

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

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MAY - 9 1994
VEMT

20 APR 1994

CECC-E

MEMORANDUM FOR ALL MAJOR SUBORDINATE COMMANDERS, AND DISTRICT COMMANDERS

SUBJECT: EPA's Clean Air Act (CAA) General Conformity Rule

1. In the Federal Register of November 30, 1993, the U.S. Environmental Protection Agency (EPA) published its final General Conformity Rule to implement Section 176(c) of the Clean Air Act (CAA) for geographic areas designated as "nonattainment" and "maintenance" areas under the CAA. EPA's final rule addresses how Federal agencies are to demonstrate that activities in which they engage conform with applicable, Federally-approved CAA state implementation plans. Because these agency conformity determinations can sometimes take considerable time and cost thousands of dollars to produce, and because failure to produce and sign an adequate conformity determination where one is required can create a serious legal vulnerability for a Corps project or permit, the Corps must ensure full and careful compliance with the new EPA Final Rule.

2. The enclosed guidance document has been prepared to assist Corps Divisions and Districts in understanding and complying with the subject rule. This guidance document is introductory in nature, and cannot be considered a substitute for careful reading of and compliance with the rule itself. (See 58 Fed.Reg. 63214 et seq.)

3. One of the primary subjects discussed in the enclosed guidance document is how the General Conformity Rule relates to the Corps regulatory program under Sections 9 and 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Ocean Dumping Act. As soon as practicable I intend to promulgate another guidance document providing more detailed instructions on how Corps personnel should deal with CAA conformity considerations regarding Corps Civil Works projects during the planning process, including preparation of CAA conformity determinations where that is necessary.

4. Although the attached document is rather "legalistic" in nature, it should be broadly distributed within the Corps family (e.g., counsel, regulatory, planning, operations, etc.). This guidance also contains important policy considerations, and thus has been fully coordinated with the Office of the Assistant Secretary of the Army (Civil Works) and with the Director of Civil Works.

5. My points of contact for this guidance are Lance Wood and Bill Sapp, CECC-E; their telephone number is (202) 272-0035.

FOR THE COMMANDER:

Lester Edelman

Encl

LESTER EDELMAN
Chief Counsel

CECC-E

# EPA'S FINAL CLEAN AIR ACT GENERAL CONFORMITY RULE

## I. INTRODUCTION.

In the Federal Register of November 30, 1993, the U.S. Environmental Protection Agency (EPA) published its final General Conformity Rule[1] to implement section 176(c) of the Clean Air Act (CAA)[2] for geographic areas designated as "nonattainment" and "maintenance" areas under the CAA. EPA's final rule addresses how Federal agencies are to demonstrate that activities in which they engage conform with applicable, Federally approved CAA state implementation plans.[3] Because these agency conformity determinations can sometimes take considerable time and cost thousands of dollars to produce[4], and because failure to produce and sign an adequate conformity determination where one is required can create a serious legal vulnerability for a Corps project or permit, the Corps must ensure full and careful compliance with the new EPA final rule.

EPA's final rule was promulgated to implement CAA section 176(c), which was added to the Clean Air Act in 1977[5] to require that Federal agencies assure that activities they engage in are in conformance with Federally-approved CAA state implementation plans.[6] This requirement is clearly triggered whenever a Federal

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[1] 58 Fed. Reg. 63214 (November 30, 1993).

[2] Clean Air Act § 176(c), 42 U.S.C. § 7506 (1993).

[3] 58 Fed. Reg. 63214 (November 30, 1993). Section 110 of the Clean Air Act requires that all states and the District of Columbia develop state implementation plans for EPA approval that provide detailed accounts of how the state will attain the National Ambient Air Quality Standards throughout the state. 42 U.S.C. § 7410 (1993).

[4] The EPA estimated in its proposed rule that a conformity determination would cost approximately $5,000, whereas an extensive conformity determination would cost $50,000. 58 Fed. Reg. 13848 (March 15, 1993). Department of Defense estimates double the figures supplied by the EPA.

[5] Pub. L. 95-95, § 176(c) (1977).

[6] Section 176(c)(1) provides in relevant part that:

> No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve,

(continued...)

agency engages in a Federal project, but it is also triggered whenever a Federal agency permits, licenses, funds, or approves a non-Federal undertaking. The Corps' Clean Water Act (CWA) section 404 permits, Rivers and Harbors Act of 1899 Section 10 permits, and Ocean Dumping Act Section 103 permits fall under this latter category.

II. APPLICABILITY.

A. EXEMPTIONS AND PRESUMPTIONS. As you study the final rule and its preamble, the first general subject to consider is the "applicability" of the rule. The new rule applies generally to Federal actions except for those covered by EPA's transportation conformity rule[7], actions with associated emissions below the de minimis levels specified at 40 CFR 91.853, certain classes of actions designated at 40 CFR 91.853 as exempted or presumed to conform, and actions that the new rule "grandfathers" at 40 CFR 91.850. A number of Corps activities may fit within the long list of "exempted" or "presumed to conform" activities. For example, note the specific exemption provided for maintenance dredging and debris disposal actions.

B. GRANDFATHER CLAUSE. As you consider the "grandfather provision", remember that it describes the specific circumstances where a Federal action need not comply with the new general conformity rule, but the Corps might nevertheless have to create and sign a CAA conformity determination to show compliance with the statutory mandate of CAA Section 176(c). However, that conformity determination would not have to comply with the specific procedural requirements of the new EPA regulation. Also note that the second basis provided in the rule for grandfathering, i.e., the three-part requirement of 40 CFR 93.150(c)(2), requires that an environmental analysis had to be commenced prior to January 31, 1994, or that a contract to develop a specific environmental analysis was awarded prior to January 31, 1994. The reference in that section to the date of December 30, 1993, was an error. The EPA has since corrected that date to January 31, 1994, by publishing the correction in the Federal Register, i.e., January 31, 1994. Moreover, that same section requires that a CAA conformity

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[6](...continued)
any activity which does not conform to an implementation plan after it has been approved or promulgated under section 110. . . . The assurance of conformity to such an implementation plan shall be an affirmative responsibility of the head of such department, agency or instrumentality.

C.A.A. § 176(c)(1), 42 U.S.C. § 7506 (1993).

[7]See 40 CFR Part 51, subpart T.

determination demonstrating compliance with the statutory mandate of CAA Section 176(c) be signed by March 15, 1994.

C. ATTAINMENT VERSUS NON-ATTAINMENT AREAS. Also regarding applicability, note that the new CAA General Conformity Rule applies only to Federal actions in CAA non-attainment areas and in those attainment areas subject to maintenance plans required by CAA Section 175A (i.e., "maintenance areas"; see 58 Fed. Reg. 13841) . EPA has announced its intentions to do another rulemaking at a later date describing how CAA Section 176(c) will be applied to CAA attainment areas, in general.

III. REQUIREMENTS OF THE NEW RULE.

To fully understand the requirements of the rule, you must carefully study both the rule itself and the explanatory guidance provided in the preamble. In the near future, the Office of the Chief Counsel expects to provide additional guidance that will assist Corps personnel who must prepare CAA conformity determinations, especially for Corps planning studies, feasibility reports, and the like. In this guidance, I only wish to emphasize a few important aspects of the rule, to ensure understanding of those matters throughout the Corps, for both our projects and our regulatory responsibilities.

A. CONFORMITY DETERMINATIONS. The basic requirement of the General Conformity Rule is stated at 40 CFR 93.150(b): "A Federal agency must make a determination that a Federal action conforms to the applicable implementation plan in accordance with the requirements of this subpart before the action is taken." (emphasis added). Obviously, to implement that mandate we must turn to the definition of "Federal action" provided at 40 CFR 93.152:

> **Federal action** means any activity engaged in by a[n] ... agency ... of the Federal Government, or any activity that a[n] ... agency ... supports in any way, provides financial assistance for, licenses, permits, or approves.... Where the Federal action is a permit, license, or other approval for some aspect of a non-Federal undertaking, the relevant activity is the part, portion, or phase of the non-Federal undertaking that requires the Federal permit, license, or approval."

B. DIRECT EMISSIONS. Regarding what air emissions must be considered in a CAA conformity determination, the rule defines two classes: direct emissions, and indirect emissions. The definition of "direct emissions" is straightforward: "Direct emissions" means those emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and occur at the same time and place as the action." (40 CFR 93.152)

C. INDIRECT EMISSIONS. In contrast, the definition of "indirect emissions" needs careful study: "indirect emissions"

means those emissions of a criteria pollutant or its precursors that: (1) Are caused by the Federal action but may occur later in time and/or may be further removed in distance from the action itself but are still reasonably foreseeable; and (2) The Federal agency can practicably control and will maintain control over due to a continuing program responsibility of the Federal agency." (40 CFR 93.152; emphasis added.) Note that the second, limiting part of that definition is crucial, since the underlined words provide essential restrictions on how far the Corps' responsibilities extend regarding documenting and controlling indirect emissions. Those restrictions from the rule's definition of "indirect emissions" are especially important, given the General Conformity Rule's broad, "but for" definition of the term "caused by": "Caused by, as used in the terms 'direct emissions' and 'indirect emissions,' means emissions that would not otherwise occur in the absence of the Federal action."[8] This definition of the term "caused by" can be characterized as a "but for" approach to the concept of causation, because, standing alone, it would require the Corps to take responsibility for all indirect emissions that would not occur without (i.e., "but for") the Corps permit or project. If the General Conformity Rule did not contain the various limiting provisions discussed herein, that "but for" approach to defining "caused by" would have made the Corps responsible for dealing with potential emissions that might not occur "but for" the Corps project or permit, but which might be substantially removed in time and/or distance from the Corps action; those emissions would be almost impossible for the Corps to predict, document, or control through mitigation measures.

Consequently, it is of considerable importance to the Corps Civil Works program that everyone understand and make proper use of the restrictions noted above in the definition of "indirect emissions" when deciding whether or how we need to prepare a CAA conformity determination. Of course, the Corps must consider the "direct emissions" caused by our proposed project or activity, or by the specific activity requiring a Corps permit. However, the final General Conformity Rule does not require the Corps to document or analyze any "indirect emissions" unless we determine that it would be practicable for the Corps to control them, and that the Corps would maintain control over them due to a continuing Corps program responsibility. As we shall discuss later, we expect that the Corps will not be legally required under the General Conformity Rule to analyze, document, and seek mitigation measures for indirect emissions for many Corps project-related actions, and for the vast majority of actions requiring Corps permit authorization, since often it will not be practicable for the Corps to control such emissions, and frequently the Corps will not have a continuing program responsibility to maintain control over them.

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[8] 40 CFR 913.152 (1994).

The logic behind the limitation on what "indirect emissions" the Corps must analyze, document, and seek mitigation measures to reduce, is explained in the preamble to EPA's rule, as follows:

> The EPA does not believe that it is reasonable to conclude that a Federal agency "supports" an activity by third persons over whom the agency has no practicable control--or "supports" emissions over which the agency has no practicable control, based on the mere fact that, if one inspects the "causal" chain of events, the activity or emissions can be described as being a "reasonably foreseeable" result of the agency's actions.
>
> In fact, achievement of the clean air goals is not primarily the responsibility of the Federal government. Instead, Congress assigned that responsibility to the State and local agencies.... Where the Federal control over the resultant emissions is relatively minor, the problem is likely caused by multiple pollution sources and a solution may be impossible unless it is directed at all the contributing sources. This role is given to the State and local agencies by Congress and should not be interpreted as the Federal agencies' role under section 176(c).[9]

## IV. CORPS IMPLEMENTATION OF THE EPA GENERAL CONFORMITY RULE.

### A. CORPS PROJECTS VERSUS NON-FEDERAL ACTIVITIES NEEDING CORPS PERMIT AUTHORIZATION.

From a legal point of view, many of the limitations on Corps responsibilities for documenting and mitigating for indirect emissions (as discussed above) apply to both Corps Civil Works projects and to Corps regulatory program actions regulating non-Federal activities. Nevertheless, there are some significant distinctions that must be made, as a practical matter, regarding how often and in what circumstances the Corps will voluntarily choose to go beyond our strict legal obligations under the General Conformity Rule regarding CAA analyses of indirect emissions. As we explain at some length hereinafter, for practical reasons, policy reasons, and legal reasons, we are not required to, and thus we will not, prepare CAA conformity determinations for the vast majority of the approximately 100,000 activities that we must authorize yearly through the Corps regulatory program. We intend to assert and make full use of the various exemptions and limitations written into the General Conformity Rule that apply to our regulatory program, which exemptions and limitations will usually lead us to conclude that the emissions we are responsible for fall below the de mimimis exemption level. Among the many reasons why this approach is necessary and appropriate is the fact

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[9] 58 Fed. Reg. 63220 (November 30, 1993)

that we must provide relatively expeditious decisions for non-Federal activities that require Corps permit authorization, and because all of the non-Federal activities that require Corps permits are fully subject to the CAA authorities of the U.S. EPA and of the state and local governments.

In contrast, some Corps water resource development projects go through lengthy planning processes, with full-scale NEPA Environmental Impact Statements, coordination with numerous state and Federal agencies, etc. Moreover, many of our water resource development projects are subject to litigation brought by project opponents. Consequently, wherever it is practicable and appropriate, the Corps will go beyond our strict legal obligations under the General Conformity Rule, and we will prepare CAA conformity determinations that consider indirect emissions that would follow from our project, even where it is debatable whether we could "practicably" control those indirect emissions, and even where it is debatable whether the Corps has a continuing program responsibility to control those indirect emissions. In other words, we should err on the side of caution in writing CAA conformity determinations for large-scale Corps projects, and in coordinating those determinations with the U.S. EPA and with state and local clean air agencies. However, whenever the Corps does voluntarily choose to go beyond our obligations under the General Conformity Rule while preparing a CAA conformity determination, the fact that we are voluntarily going beyond our understanding of our legal obligations must be clearly stated in our public documentation.

When the Corps prepares a CAA conformity determination for a Corps project in the planning stage, and in that conformity determination we voluntatily address all indirect emissions that would be "caused by" our project, that will provide us the valuable opportunity to demonstrate that any short-term increase in emissions from project construction will be entirely or partially offset by decreases in long-term, "without project condition" emissions, due to increased efficiencies (for example, through more efficient port operations from a port improvement project). Also, when we prepare a CAA conformity determination that deals with all indirect emissions that can reasonably be said to be "caused by" our project, our project can be presented to the state CAA authority and specifically approved as part of the state implementation plan, along with any necessary state revisions to that SIP necessary to accommodate the Federal project and all associated indirect emissions. Development and coordination of our CAA conformity determination should be undertaken as early as possible in the planning stage for a large-scale or litigation-prone Corps project. The resulting documentation will be extremely useful to help defend our project from potential litigation challenging compliance with the CAA. On the other hand, for small-scale Corps projects, covered only by environmental assessments and findings of no significant impact, and where no CAA-related litigation can be anticipated, we can probably rely only on the

exemptions found in the General Conformity Rule, and need not necessarily prepare a full-blown CAA conformity determination voluntarily addressing various indirect emissions. Please feel free to consult the points of contact provided in this guidance if you are in doubt about whether a particular Civil Works activity should be covered by a CAA conformity determination voluntarily covering indirect emissions.

B. THE CORPS REGULATORY PROGRAM.

One crucial aspect of this guidance involves how we expect all Corps offices to implement the CAA General Conformity Rule regarding non-Federal activities requiring authorization under the Corps regulatory program. Of course, if another Federal agency requires a Corps permit for one of its activities or projects, that Federal agency is fully responsible for ensuring compliance with CAA Section 176(c), and the Corps can adopt and rely upon that agency's conformity determination, or upon whatever waiver or presumption under the CAA General Conformity Rule that agency believes will satisfy CAA Section 176(c). However, for non-Federal activities, the Corps must take responsibility for whatever CAA conformity determination may be necessary. Nevertheless, for the reasons explained hereinafter, the new rule and its preamble clearly indicate that the vast majority of activities needing Corps permit authorization will not require a CAA conformity determination, because practically all of those activities will fall below the de minimis threshold levels for emissions specified at 40 CFR 93.153.

C. SCOPE OF ANALYSIS. One feature of EPA's final General Conformity Rule that clearly demonstrates that the Corps will not have to perform many conformity determinations is the rule's definition of the term "Federal action". The final rule's definition clearly distinguishes between large Federal projects, such as a Federally funded and Federally controlled military base, versus non-Federal undertakings that simply require a Federal permit. Oftentimes in the latter case, the Federal agency only has to permit a minor part, portion, or phase of a much larger non-Federal undertaking. To reflect the limited Federal responsibility under the CAA derived from such Federal permits, the EPA definition of "Federal action" indicates that, in complying with section 176(c), Federal regulatory agencies are only responsible for analyzing the emissions resulting from the "part, portion, or phase" of the non-Federal undertaking that they permit. To deal with this important point, the EPA added the following sentence to the final rule's definition of "Federal action":

> Where the Federal action is a permit, license, or other approval for some aspect of a non-Federal undertaking, the relevant activity is the part, portion, or phase of

the non-Federal undertaking that requires the Federal permit, license, or approval.[10]

As you can see, the legal principle behind the quoted sentence is the same principle that supports the "narrow scope of analysis" approach for our NEPA documents reflected at Appendix B of 33 CFR Part 325, paragraph 7.b. and the "permit area" approach used to limit Corps responsibilities in Appendix C, implementing the National Historic Preservation Act.[11] The rule of administrative law and practice created by the sentence just quoted from EPA's definition of "Federal action" is that, for the limited and particular purposes of the CAA Conformity Rule and for every Corps CAA conformity determination for a Corps regulatory action under this rule, the Corps will always use a narrow "scope of analysis" for purposes of CAA Section 176(c), even if we choose to use a broader scope of analysis for purposes of NEPA, the public interest review, or the 404(b)(1) analysis for that same permit case.

This narrow scope of analysis for purposes of the CAA conformity analysis is always appropriate, for several reasons. For example, the Corps regulators have no expertise or authority allowing them to evaluate or control air emissions from the larger, overall projects, such as a shopping center, that may require a Corps permit for one phase or portion of that larger project (e.g., placement of fill material on which part of the shopping center will later be constructed and operated). In contrast, the state and EPA clean air authorities have broad, general authority, expertise, and responsibility to evaluate and control air emissions from the larger, overall projects, such as shopping centers, regardless of whether part of all of such a shopping center happens to be constructed on fill material permitted by the Corps of Engineers.

D. CONFORMITY DETERMINATIONS FOR CORPS PERMITS CASES WILL BE NECESSARY VERY RARELY. The sentence quoted above from EPA's definition of "Federal action" may well be the most important provision of the General Conformity Rule relating to the Corps regulatory program, because this provision, in conjunction with the restrictive language discussed above from the definition of "indirect emissions", means that very rarely will the Corps have to prepare a CAA conformity determination document for a Corps regulatory action. The reasons for this conclusion are reflected in the following case example, provided by EPA in the preamble of the final General Conformity Rule. In this example, the EPA shows the close relationship between the sentence quoted above from the definition of "Federal action" and the restrictive language from the definition of "indirect emissions", as follows:

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[10] 58 Fed. Reg. 63248 (November 30, 1993).

[11]. 55 Fed. Reg. 27000 (June 29, 1990)

> [In the final rule] the definition of "Federal action" is revised by adding the following sentence to the end of the definition in the [proposed rule]: Where the Federal action is a permit, license, or other approval for some aspect of a nonfederal undertaking, the relevant activity is the part, portion, or phase of the nonfederal undertaking that requires the Federal permit, license or approval. The following examples illustrate the meaning of the revised definition.
>
> Assume, for example, that the [Corps] issues a permit and that permitted fill activity represents one phase of a larger nonfederal undertaking; i.e., the construction of an office building by a nonfederal entity. Under the conformity rule, the [Corps] would be responsible for addressing all emissions from that one phase of the overall office development undertaking that the [Corps] permits; i.e., the fill activity at the wetland site. However, the [Corps] is not responsible for evaluating all emissions from later phases of the overall office development (the construction, operation, and use of the office building itself), because later phases generally are not within the [Corps'] continuing program responsibility and generally cannot be practicably controlled by the [Corps].[12]

The conclusion to be drawn regarding the preamble's case example is that the Corps almost certainly would not have to prepare a CAA conformity determination for that permit action described in the preamble, because the direct emissions from the fill activity would be relatively minor, and thus in all probability they would fall below the de minimis levels exempted by 40 CFR 93.153. Moreover, in this example one cannot identify any indirect emissions for which the Corps would be responsible.

E. "PART, PORTION, OR PHASE" OF A LARGER UNDERTAKING. The preamble for the final rule provides several other important explanatory passages that accurately describe the limited nature of the responsibilities the Corps must fulfill as we operate our regulatory program in compliance with EPA's General Conformity Rule. As the EPA states in the preamble, the "inclusive definition" that EPA had published for public comment in the proposed rule to define the term "indirect emissions" would have been overly burdensome and inappropriate for regulatory programs that might have to "document the air quality affects from tens of thousands of public and private business activities each year, even where the associated Federal action in extremely minor."[13] The EPA

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[12] 58 Fed. Reg. 63227 (November 30, 1993).

[13] 58 Fed. Reg. 63219 (November 30, 1993).

goes on to use the Corps in an illustration of this point by explaining that:

> [T]he Army Corps of Engineers estimates that 65,000 of their regulatory actions would have required a conformity review in 1992 under the inclusive definition. The [Corps] permits are often limited to a small portion of a much larger project and, thus, may not be the best mechanism to review the larger project: e.g., one river crossing for a 500 mile gas pipeline or a half-acre wetland fill for a twenty acre shopping mall.[14]

As the EPA explains here, it would be impractical to force a Federal regulatory agency like the Corps to do potentially time-consuming and costly air quality analyses when the activity that agency permits may be a very minor aspect of a much larger non-Federal undertaking, and when that specific activity needing a Corps permit may have little or no effect on air quality.

F. CONTINUING PROGRAM RESPONSIBILITY. The EPA also used the Corps in an illustration to explain the phrase "continuing program responsibility" in the definition of the term "indirect emissions". In their example the EPA explains that only if the Corps were to impose conditions on a permit as part of its responsibilities under its regulatory program and these permit conditions, in and of themselves, would lead to an increase in the air emissions caused by the activity, would the Corps be required to include the air emissions caused by its permit conditions in our CAA conformity analysis.[15] However, the preamble to EPA's rule makes clear that normally the Corps is not responsible for indirect emissions related to activities needing Corps permits:

> j. Exclusive definition [for the term "indirect emissions"]--types of Federal actions not covered. The following types of Federal actions, among others, are not covered by the conformity rule under the exclusive definition approach [i.e., the approach adopted in the final rule]....(3) Certain indirect emissions related to a [Corps of Engineers] permit for the discharge of dredged or fill material. The indirect emissions from development activities related to [Corps] permit actions are not subject to the continuing program responsibility of the [Corps], or cannot be practicably controlled by the [Corps].[16]

The EPA preamble also recognizes that the Corps has an explicit exemption from the conformity rule where:

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[14] 58 Fed. Reg. 63219 (November 30, 1993).

[15] 58 Fed. Reg. 63220 (November 30, 1993).

[16] 58 Fed. Reg. 63224 (November 30, 1993).

> The indirect emissions from development activities related to [Corps] permit actions are not covered where such emissions are not subject to the continuing program responsibility of the [Corps], or cannot be practicably controlled by the [Corps].[17]

The EPA then goes on in the preamble to explain the changes in the definition for the term "indirect emissions" that EPA adopted in its final General Conformity Rule (i.e., the "exclusive" definition). Again it uses the Corps in an illustration. The EPA points out that conformity analyses are not required when Federal actions are incidental to later development by private parties. As the EPA states:

> ...this approach would not require a conformity analysis for certain Federal actions that are necessary for, but incidental to, subsequent development by private parties. For example, the exclusive definition does not generally require that a [Corps] fill permit needed for a relatively minor part, portion, or phase of a twenty acre development on private land would somehow require the [Corps] to evaluate all emissions from the construction, operation, and use of that larger development.[18] (emphasis added)

Here the EPA explains that the "activity" contemplated under section 176(c) in many cases is properly limited to the particular "part, portion, or phase" of a non-Federal action that is actually permitted by the regulatory agency (i.e., the Corps). As the EPA goes on to explain:

> The person's [i.e., permit applicant's] activities that fall outside the Federal agency's continuing program responsibility to control are subject to control by state and local agencies.[19]

As indicated above, generally speaking the Corps does not have a continuing program responsibility to measure, monitor, control, or mitigate for air emissions that may result from the construction or operation of a non-Corps facility (such as a shopping center, factory, or non-Federal port), even though some part, portion, or phase of that facility requires a permit from the Corps. Under the CAA, the state and local clean air authorities have full responsibility and authority to deal with those emissions, and to prevent or condition the construction of the non-Federal facility as necessary to deal with those air emissions. Under the General

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[17] 58 Fed. Reg. 63224 (November 30, 1993).

[18] 58 Fed. Reg. 63222 (November 30, 1993).

[19] 58 Fed. Reg. 63222 (November 30, 1993)

Conformity Rule the Corps (1) must consider direct emissions from only the particular part, portion, or phase of the larger, non-Federal facility that we permit; and (2) we must consider indirect emissions from that same part, portion, or phase, and then only to the extent that we can practicably control them, and have a continuing program responsibility to control them.

G. CORPS DOCUMENTATION OF COMPLIANCE WITH CAA SECTION 176(C)

For any permit case where the Corps reasonably determines that the emissions from the particular "part, portion, or phase" of a larger, non-Federal undertaking, needing a Corps permit, would fall below the de minimis threshold levels of 40 CFR 93.153, the Corps will not have to conduct a technical analysis to document that the emissions from the proposed undertaking would not exceed the de minimis thresholds. This conclusion is supported by the following example taken from EPA's preamble to the General Conformity Rule:

> Example 4: Where a [Corps of Engineers] permit is needed to fill a wetland so that a shopping center can be built on the fill, generally speaking, the [Corps] could not practicably maintain control over and would not have a continuing program responsibility to control indirect emissions from subsequent construction, operation, or use of that shopping center. Therefore, only those emissions from the equipment and motor vehicles used in the filling operation, support equipment, and emissions from movement of the fill material itself would be included in the analysis. If such emissions are below the de minimis levels described below for applicability purposes (section 51.858), no conformity determination ... would be required for the issuance of the ... permit.[20]

The same point is made elsewhere in the preamble to the General Conformity Rule, as follows:

> Most Federal actions result in little or no direct or indirect air emissions. The EPA intends such actions to be exempted under the de minimis levels specified in the rule and, thus, no further analysis by the Federal agency is required to demonstrate that such actions conform.... Further, the EPA believes that Federal actions which are de minimis should not be required by this rule to make an applicability analysis. A different interpretation could result in an extremely wasteful process which generates vast numbers of useless conformity statements. Paragraphs (c)(1) and (2) of Section 51.853 are added to the final rule to provide that de minimis actions are exempt from the requirements of this rule. Therefore, it is

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[20] 58 Fed. Reg. 63223 (November 30, 1993).

not necessary for a Federal agency to document emissions levels for a de minimis action.[21]

Although we expect that the vast majority of activities needing Corps permits will not need CAA conformity determinations for the reasons explained above, nevertheless, for any permit case where litigation can be anticipated if the Corps issues the permit, the permit administrative record should explain our limited CAA responsibilities under the CAA General Conformity Rule, and the basis for our conclusion that the relevant emissions would be de minimis. That explanation often may need to include a discussion of why it would not be "practicable" for the Corps to control certain specified indirect emissions, and why the Corps does not have a continuing program responsibility to control such indirect emissions, and why our CAA responsibilities are limited to the particular "part, portion, or phase" of a larger undertaking requiring Corps permit authorization.

V. CONCLUSION.

Because of the various provisions discussed above, we expect that very few Corps permit actions will require CAA conformity analyses, and that our CAA conformity determinations will normally conclude that the air emissions relevant to our permit action are safely below the final rule's de minimis levels. It seems that the only time that the Corps will have to do a full-scale CAA conformity determination in a permit case is when the emissions associated with the particular activity needing the Corps permit, or the particular activity required by Corps permit conditions (e.g., the placement of the fill, or the construction of the structure in the water, or the actual dredging and disposal operation, or implementation of the required mitigation plan) are so substantial that those emissions would exceed the de minimis thresholds by themselves. This conclusion flows logically from the provisions discussed above from EPA's final rule and preamble, based in part on the principle of limited Corps responsibilities under the CAA.

Nevertheless, the practical necessity that the Corps will use a "narrow scope of analysis" to limit our requirements under the CAA conformity rule must not lead the Corps necessarily to use such a narrow scope of analysis for purposes of the Corps' other responsibilities under other aspects of the public interest review or the 404(b)(1) Guidelines. Because the Corps has ample discretion to adopt and use a broader scope of analysis for purposes of NEPA, the Endangered Species Act, etc., we will not use the CAA conformity determination as an excuse or occasion to reduce our more wide-ranging reviews and responsibilities under those other statutes and regulations.

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[21] 58 Fed. Reg. 63228-63229 (November 30, 1993).

The Corps' very limited expertise, authority, and continuing program responsibilities regarding air emissions fully justifies our using a narrow scope of analysis for purposes of compliance with CAA Section 176(c). In contrast, our broader, traditional responsibility, authority, and expertise to regulate activities affecting aquatic resources will often justify our using a broader scope of analysis to consider effects of a proposed undertaking on aquatic resources, endangered species, etc. Thus, for any particular permit case, the Corps will implement the CAA General Conformity Rule by focusing on only the specific part, portion, or phase of the larger undertaking that requires our permit authorization. Nevertheless, we often will consider all direct and indirect effects of the larger undertaking when evaluating effects on the aquatic environment.

Corps Headquarters points of contact for this guidance are Lance Wood and Bill Sapp of the Office of the Chief Counsel (CECC-E); their telephone number is (202) 272-0035. However, non-counsel Corps employees should only contact them in conjunction with district/division counsel to ensure proper coordination.

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## Appendix 5-B
# AIR QUALITY CALCULATIONS

# Program Construction Calculations

# URBEMIS EMISISONS SUMMARY FOR ONSITE AND REGIONAL CONSTRUCTION ACTIVITIES

**JWPCP Solids Processing**

UNMITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Excavation Work** | | | | | | | |
| On-site Total | 4.35 | 30.96 | 23.35 | - | 20.83 | 5.35 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 19.43 | 4.06 | - |
| Off-Road Diesel | 4.35 | 30.96 | 23.35 | - | 1.40 | 1.29 | 5,101.66 |
| Off-site Total | 1.08 | 11.04 | 5.46 | 0.04 | 0.53 | 0.40 | 4,182.74 |
| On-Road Diesel | 1.05 | 10.99 | 4.42 | 0.04 | 0.51 | 0.39 | 3,965.26 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **5.43** | **42.00** | **28.81** | **0.04** | **21.36** | **5.75** | **9,284.40** |
| **Digester Install** | | | | | | | |
| On-site Total | 1.21 | 8.40 | 7.54 | - | 19.84 | 4.44 | 1,655.97 |
| Fugitive Dust | | | | | 19.43 | 4.06 | |
| Off-Road Diesel | 1.21 | 8.40 | 7.54 | - | 0.41 | 0.38 | 1,655.97 |
| Off-site Total | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| **Grand Total** | **1.23** | **8.44** | **8.28** | **-** | **19.85** | **4.45** | **1,811.32** |
| **On-site Emissions Totals** | | | | | | | |
| Excavation Work | 4.4 | 31.0 | 23.4 | - | 20.8 | 5.4 | 5,101.7 |
| Digester Install | 1.2 | 8.4 | 7.5 | - | 19.8 | 4.4 | 1,656.0 |
| **Maximum On-site Emissions** | **4** | **31** | **23** | **-** | **21** | **5** | **5,102** |
| Localized Significance Threshold | -- | 66 | 1,982 | -- | 58 | 18 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Excavation Work | 5.4 | 42.0 | 28.8 | 0.0 | 21.4 | 5.8 | 9,284.4 |
| Digester Install | 1.2 | 8.4 | 8.3 | - | 19.9 | 4.5 | 1,811.3 |
| **Maximum Regional Emissions** | **5** | **42** | **29** | **0** | **21** | **6** | **9,284** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

MITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Excavation Work** | | | | | | | |
| On-site Total | 0.64 | 5.18 | 23.35 | - | 20.05 | 4.64 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 19.43 | 4.06 | - |
| Off-Road Diesel | 0.64 | 5.18 | 23.35 | - | 0.62 | 0.58 | 5,101.66 |
| Off-site Total | 1.08 | 11.04 | 5.46 | 0.04 | 0.53 | 0.40 | 4,182.74 |
| On-Road Diesel | 1.05 | 10.99 | 4.42 | 0.04 | 0.51 | 0.39 | 3,965.26 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **1.72** | **16.22** | **28.81** | **0.04** | **20.58** | **5.04** | **9,284.40** |
| **Digester Install** | | | | | | | |
| On-site Total | 1.21 | 8.40 | 7.54 | - | 19.84 | 4.44 | 1,655.97 |
| Fugitive Dust | - | - | - | - | 19.43 | 4.06 | - |
| Off-Road Diesel | 1.21 | 8.40 | 7.54 | - | 0.41 | 0.38 | 1,655.97 |
| Off-site Total | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| **Grand Total** | **1.23** | **8.44** | **8.28** | **-** | **19.85** | **4.45** | **1,811.32** |
| **On-site Emissions Totals** | | | | | | | |
| Excavation Work | 0.6 | 5.2 | 23.4 | - | 20.1 | 4.6 | 5,101.7 |
| Digester Install | 1.2 | 8.4 | 7.5 | - | 19.8 | 4.4 | 1,656.0 |
| **Maximum On-site Emissions** | **1** | **8** | **23** | **-** | **20** | **5** | **5,102** |
| Localized Significance Threshold[b] | -- | 66 | 1,982 | -- | 58 | 18 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Excavation Work | 2 | 16 | 29 | 0 | 21 | 5 | 9,284 |
| Digester Install | 1 | 8 | 8 | 0 | 20 | 4 | 1,811 |
| **Maximum Regional Emissions** | **2** | **16** | **29** | **0** | **21** | **5** | **9,284** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\San Diego\10_Staff\Air Quality Staff\clearwater\Analysis_URBEMIS runs\JWPCP Solids Processing.urb924

Project Name: Joint Water PCP Process Optimization

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 TOTALS (lbs/day unmitigated) | 5.43 | 42.00 | 28.81 | 0.04 | 61.24 | 1.79 | 63.03 | 12.81 | 1.64 | 14.45 | 9,284.40 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/1/2018-1/1/2018 Active Days: 1 | **5.43** | **42.00** | **28.81** | **0.04** | **61.24** | **1.79** | **63.03** | **12.81** | **1.64** | **14.45** | **9,284.40** |
| Mass Grading 01/01/2018-01/01/2018 | 5.43 | 42.00 | 28.81 | 0.04 | 61.24 | 1.79 | 63.03 | 12.81 | 1.64 | 14.45 | 9,284.40 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 61.10 | 0.00 | 61.10 | 12.76 | 0.00 | 12.76 | 0.00 |
| Mass Grading Off Road Diesel | 4.35 | 30.96 | 23.35 | 0.00 | 0.00 | 1.40 | 1.40 | 0.00 | 1.29 | 1.29 | 5,101.66 |
| Mass Grading On Road Diesel | 1.05 | 10.99 | 4.42 | 0.04 | 0.13 | 0.38 | 0.51 | 0.04 | 0.35 | 0.39 | 3,965.26 |
| Mass Grading Worker Trips | 0.03 | 0.05 | 1.04 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | 0.01 | 217.48 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/2/2018-1/2/2018 Active Days: 1 | 1.23 | 8.44 | 8.29 | 0.00 | 61.11 | 0.42 | 61.52 | 12.76 | 0.38 | 13.15 | 1,811.32 |
| Mass Grading 01/02/2018-01/02/2018 | 1.23 | 8.44 | 8.29 | 0.00 | 61.11 | 0.42 | 61.52 | 12.76 | 0.38 | 13.15 | 1,811.32 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 61.10 | 0.00 | 61.10 | 12.76 | 0.00 | 12.76 | 0.00 |
| Mass Grading Off Road Diesel | 1.21 | 8.40 | 7.54 | 0.00 | 0.00 | 0.41 | 0.41 | 0.00 | 0.38 | 0.38 | 1,655.97 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.02 | 0.04 | 0.74 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 155.35 |

Phase Assumptions

Phase: Mass Grading 1/1/2018 - 1/1/2018 - Excavation work

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 5

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 935.56

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/2/2018 - 1/2/2018 - Digester install

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 5

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

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1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

# URBEMIS EMISISONS SUMMARY FOR ONSITE AND REGIONAL CONSTRUCTION ACTIVITIES

**LBWRP Process Optimization**

UNMITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 4.35 | 30.96 | 23.35 | - | 5.43 | 2.13 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 4.03 | 0.84 | - |
| Off-Road Diesel | 4.35 | 30.96 | 23.35 | - | 1.40 | 1.29 | 5,101.66 |
| Off-site Total | 0.85 | 8.60 | 4.47 | 0.03 | 0.42 | 0.32 | 3,299.94 |
| On-Road Diesel | 0.82 | 8.55 | 3.43 | 0.03 | 0.40 | 0.31 | 3,082.46 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **5.20** | **39.56** | **27.82** | **0.03** | **5.85** | **2.45** | **8,401.60** |
| **Tank Installation** | | | | | | | |
| On-site Total | 4.50 | 31.61 | 20.05 | - | 5.35 | 2.06 | 5,567.33 |
| Fugitive Dust | | | | | 4.03 | 0.84 | |
| Off-Road Diesel | 4.50 | 31.61 | 20.05 | - | 1.32 | 1.22 | 5,567.33 |
| Off-site Total | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| **Grand Total** | **4.52** | **31.66** | **20.94** | **-** | **5.36** | **2.07** | **5,753.74** |
| **On-site Emissions Totals** | | | | | | | |
| Site Prep | 4.4 | 31.0 | 23.4 | - | 5.4 | 2.1 | 5,101.7 |
| Tank Installation | 4.5 | 31.6 | 20.1 | - | 5.4 | 2.1 | 5,567.3 |
| **Maximum On-site Emissions** | **5** | **32** | **23** | **-** | **5** | **2** | **5,567** |
| Localized Significance Threshold[b] | -- | 32 | 585 | -- | 61 | 26 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Site Prep | 5.2 | 39.6 | 27.8 | 0.0 | 5.9 | 2.5 | 8,401.6 |
| Tank Installation | 4.5 | 31.7 | 20.9 | - | 5.4 | 2.1 | 5,753.7 |
| **Maximum Regional Emissions** | **5** | **40** | **28** | **0** | **6** | **2** | **8,402** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

MITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 0.63 | 5.18 | 23.35 | - | 4.67 | 1.43 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 4.03 | 0.84 | - |
| Off-Road Diesel | 0.63 | 5.18 | 23.35 | - | 0.64 | 0.59 | 5,101.66 |
| Off-site Total | 0.85 | 8.60 | 4.47 | 0.03 | 0.42 | 0.32 | 3,299.94 |
| On-Road Diesel | 0.82 | 8.55 | 3.43 | 0.03 | 0.40 | 0.31 | 3,082.46 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **1.48** | **13.78** | **27.82** | **0.03** | **5.09** | **1.75** | **8,401.60** |
| **Tank Installation** | | | | | | | |
| On-site Total | 0.66 | 5.28 | 20.05 | - | 4.58 | 1.35 | 5,567.33 |
| Fugitive Dust | - | - | - | - | 4.03 | 0.84 | - |
| Off-Road Diesel | 0.66 | 5.28 | 20.05 | - | 0.55 | 0.51 | 5,567.33 |
| Off-site Total | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| **Grand Total** | **0.68** | **5.33** | **20.94** | **-** | **4.59** | **1.36** | **5,753.74** |
| **On-site Emissions Totals** | | | | | | | |
| Demolition | 0.6 | 5.2 | 23.4 | - | 4.7 | 1.4 | 5,101.7 |
| Site Grading | 0.7 | 5.3 | 20.1 | - | 4.6 | 1.4 | 5,567.3 |
| **Maximum On-site Emissions** | **1** | **5** | **23** | **-** | **5** | **1** | **5,567** |
| Localized Significance Threshold[b] | -- | 32 | 585 | -- | 61 | 26 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Demolition | 1.5 | 13.8 | 27.8 | 0.0 | 5.1 | 1.7 | 8,401.6 |
| Site Grading | 0.7 | 5.3 | 20.9 | - | 4.6 | 1.4 | 5,753.7 |
| **Maximum Regional Emissions** | **1** | **14** | **28** | **0** | **5** | **2** | **8,402** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

**3/30/2010 3:20:58 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\San Diego\10_Staff\Air Quality Staff\clearwater\Analysis\URBEMIS\Process Optimization\Long Beach wrp.urb924

Project Name: Long Beach WRP Process Optimization

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 TOTALS (lbs/day unmitigated) | 5.20 | 39.56 | 27.82 | 0.03 | 16.37 | 1.70 | 18.07 | 3.43 | 1.57 | 5.00 | 8,401.60 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/1/2018-1/1/2018 Active Days: 1 | **5.20** | **39.56** | **27.82** | **0.03** | **16.37** | **1.70** | **18.07** | **3.43** | **1.57** | **5.00** | **8,401.60** |
| Mass Grading 01/01/2018-01/01/2018 | 5.20 | 39.56 | 27.82 | 0.03 | 16.37 | 1.70 | 18.07 | 3.43 | 1.57 | 5.00 | 8,401.60 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.25 | 0.00 | 16.25 | 3.39 | 0.00 | 3.39 | 0.00 |
| Mass Grading Off Road Diesel | 4.35 | 30.96 | 23.35 | 0.00 | 0.00 | 1.40 | 1.40 | 0.00 | 1.29 | 1.29 | 5,101.66 |
| Mass Grading On Road Diesel | 0.82 | 8.55 | 3.43 | 0.03 | 0.10 | 0.30 | 0.40 | 0.03 | 0.27 | 0.31 | 3,082.46 |
| Mass Grading Worker Trips | 0.03 | 0.05 | 1.04 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | 0.01 | 217.48 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/2/2018-1/2/2018 Active Days: 1 | 4.53 | 31.66 | 20.94 | 0.00 | 16.26 | 1.33 | 17.59 | 3.40 | 1.22 | 4.62 | 5,753.75 |
| Mass Grading 01/02/2018-01/02/2018 | 4.53 | 31.66 | 20.94 | 0.00 | 16.26 | 1.33 | 17.59 | 3.40 | 1.22 | 4.62 | 5,753.75 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.25 | 0.00 | 16.25 | 3.39 | 0.00 | 3.39 | 0.00 |
| Mass Grading Off Road Diesel | 4.50 | 31.61 | 20.05 | 0.00 | 0.00 | 1.32 | 1.32 | 0.00 | 1.22 | 1.22 | 5,567.33 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.02 | 0.05 | 0.89 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 186.41 |

Phase Assumptions

Phase: Mass Grading 1/1/2018 - 1/1/2018 - Tank Site Work

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 1.33

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 727.27

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/2/2018 - 1/2/2018 - Tank Installation

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 1.33

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

**3/30/2010 3:20:58 PM**

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

# URBEMIS EMISISONS SUMMARY FOR ONSITE AND REGIONAL CONSTRUCTION ACTIVITIES

**POWRP Process Optimization**

UNMITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 2.76 | 19.32 | 15.25 | - | 2.72 | 1.20 | 3,308.97 |
| Fugitive Dust | - | - | - | - | 1.83 | 0.38 | - |
| Off-Road Diesel | 2.76 | 19.32 | 15.25 | - | 0.89 | 0.82 | 3,308.97 |
| Off-site Total | 0.92 | 9.44 | 4.52 | 0.03 | 0.45 | 0.35 | 3,546.07 |
| On-Road Diesel | 0.90 | 9.40 | 3.78 | 0.03 | 0.44 | 0.34 | 3,390.72 |
| Worker Trips | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| **Grand Total** | **3.68** | **28.76** | **19.77** | **0.03** | **3.17** | **1.55** | **6,855.04** |
| **Tank Installation** | | | | | | | |
| On-site Total | 3.32 | 22.44 | 15.19 | - | 2.78 | 1.25 | 4,321.74 |
| Fugitive Dust | | | | | 1.83 | 0.38 | |
| Off-Road Diesel | 3.32 | 22.44 | 15.19 | - | 0.95 | 0.87 | 4,321.74 |
| Off-site Total | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| **Grand Total** | **3.34** | **22.48** | **15.93** | **-** | **2.79** | **1.26** | **4,477.09** |
| **On-site Emissions Totals** | | | | | | | |
| Site Prep | 2.8 | 19.3 | 15.3 | - | 2.7 | 1.2 | 3,309.0 |
| Tank Installation | 3.3 | 22.4 | 15.2 | - | 2.8 | 1.3 | 4,321.7 |
| **Maximum On-site Emissions** | **3** | **22** | **15** | **-** | **3** | **1** | **4,322** |
| Localized Significance Threshold[b] | -- | 72 | 911 | -- | 57 | 18 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Site Prep | 3.7 | 28.8 | 19.8 | 0.0 | 3.2 | 1.6 | 6,855.0 |
| Tank Installation | 3.3 | 22.5 | 15.9 | - | 2.8 | 1.3 | 4,477.1 |
| **Maximum Regional Emissions** | **4** | **29** | **20** | **0** | **3** | **2** | **6,855** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

MITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 0.40 | 3.23 | 15.25 | - | 2.24 | 0.76 | 3,308.97 |
| Fugitive Dust | - | - | - | - | 1.83 | 0.38 | - |
| Off-Road Diesel | 0.40 | 3.23 | 15.25 | - | 0.41 | 0.38 | 3,308.97 |
| Off-site Total | 0.92 | 9.44 | 4.52 | 0.03 | 0.45 | 0.35 | 3,546.07 |
| On-Road Diesel | 0.90 | 9.40 | 3.78 | 0.03 | 0.44 | 0.34 | 3,390.72 |
| Worker Trips | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| **Grand Total** | **1.32** | **12.67** | **19.77** | **0.03** | **2.69** | **1.11** | **6,855.04** |
| **Tank Installation** | | | | | | | |
| On-site Total | 0.49 | 3.75 | 15.19 | - | 2.23 | 0.75 | 4,321.74 |
| Fugitive Dust | - | - | - | - | 1.83 | 0.38 | - |
| Off-Road Diesel | 0.49 | 3.75 | 15.19 | - | 0.40 | 0.37 | 4,321.74 |
| Off-site Total | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.04 | 0.74 | - | 0.01 | 0.01 | 155.35 |
| **Grand Total** | **0.51** | **3.79** | **15.93** | **-** | **2.24** | **0.76** | **4,477.09** |
| **On-site Emissions Totals** | | | | | | | |
| Demolition | 0.4 | 3.2 | 15.3 | - | 2.2 | 0.8 | 3,309.0 |
| Site Grading | 0.5 | 3.8 | 15.2 | - | 2.2 | 0.8 | 4,321.7 |
| **Maximum On-site Emissions** | **0** | **4** | **15** | **-** | **2** | **1** | **4,322** |
| Localized Significance Threshold[b] | -- | 72 | 911 | -- | 57 | 18 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Demolition | 1.3 | 12.7 | 19.8 | 0.0 | 2.7 | 1.1 | 6,855.0 |
| Site Grading | 0.5 | 3.8 | 15.9 | - | 2.2 | 0.8 | 4,477.1 |
| **Maximum Regional Emissions** | **1** | **13** | **20** | **0** | **3** | **1** | **6,855** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

**3/30/2010 11:16:15 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\Clearwater\Analysis\URBEMIS\Process Optimization\pomona wrp.urb924

Project Name: Pomona WRP Process Optimization

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 TOTALS (lbs/day unmitigated) | 3.68 | 28.76 | 19.77 | 0.03 | 7.33 | 1.22 | 8.55 | 1.55 | 1.13 | 2.67 | 6,855.04 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/1/2018-1/1/2018 Active Days: 1 | **3.68** | **28.76** | **19.77** | **0.03** | **7.33** | **1.22** | **8.55** | **1.55** | **1.13** | **2.67** | **6,855.04** |
| Mass Grading 01/01/2018-01/01/2018 | 3.68 | 28.76 | 19.77 | 0.03 | 7.33 | 1.22 | 8.55 | 1.55 | 1.13 | 2.67 | 6,855.04 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 7.21 | 0.00 | 7.21 | 1.51 | 0.00 | 1.51 | 0.00 |
| Mass Grading Off Road Diesel | 2.76 | 19.32 | 15.25 | 0.00 | 0.00 | 0.89 | 0.89 | 0.00 | 0.82 | 0.82 | 3,308.97 |
| Mass Grading On Road Diesel | 0.90 | 9.40 | 3.78 | 0.03 | 0.11 | 0.33 | 0.44 | 0.04 | 0.30 | 0.34 | 3,390.72 |
| Mass Grading Worker Trips | 0.02 | 0.04 | 0.74 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 155.35 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/2/2018-1/2/2018 Active Days: 1 | 3.34 | 22.48 | 15.93 | 0.00 | 7.22 | 0.96 | 8.17 | 1.51 | 0.88 | 2.39 | 4,477.08 |
| Mass Grading 01/02/2018-01/02/2018 | 3.34 | 22.48 | 15.93 | 0.00 | 7.22 | 0.96 | 8.17 | 1.51 | 0.88 | 2.39 | 4,477.08 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 7.21 | 0.00 | 7.21 | 1.51 | 0.00 | 1.51 | 0.00 |
| Mass Grading Off Road Diesel | 3.32 | 22.44 | 15.19 | 0.00 | 0.00 | 0.95 | 0.95 | 0.00 | 0.87 | 0.87 | 4,321.74 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.02 | 0.04 | 0.74 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 155.35 |

Phase Assumptions

Phase: Mass Grading 1/1/2018 - 1/1/2018 - Tank Site Work

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0.59

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 800

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/2/2018 - 1/2/2018 - Tank Installation

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0.59

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

**3/30/2010 11:16:15 PM**

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

# URBEMIS EMISISONS SUMMARY FOR ONSITE AND REGIONAL CONSTRUCTION ACTIVITIES

**LCWRP Process Optimization**

UNMITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 4.35 | 30.96 | 23.35 | - | 5.31 | 2.11 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 3.91 | 0.82 | - |
| Off-Road Diesel | 4.35 | 30.96 | 23.35 | - | 1.40 | 1.29 | 5,101.66 |
| Off-site Total | 0.93 | 9.45 | 4.82 | - | 0.46 | 0.35 | 3,608.20 |
| On-Road Diesel | 0.90 | 9.40 | 3.78 | - | 0.44 | 0.34 | 3,390.72 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **5.28** | **40.41** | **28.17** | **-** | **5.77** | **2.46** | **8,709.86** |
| **Tank Installation** | | | | | | | |
| On-site Total | 4.50 | 31.61 | 20.05 | - | 5.23 | 2.04 | 5,567.33 |
| Fugitive Dust | | | | | 3.91 | 0.82 | |
| Off-Road Diesel | 4.50 | 31.61 | 20.05 | - | 1.32 | 1.22 | 5,567.33 |
| Off-site Total | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| **Grand Total** | **4.52** | **31.66** | **20.94** | **-** | **5.24** | **2.05** | **5,753.74** |
| **On-site Emissions Totals** | | | | | | | |
| Site Prep | 4.4 | 31.0 | 23.4 | - | 5.3 | 2.1 | 5,101.7 |
| Tank Installation | 4.5 | 31.6 | 20.1 | - | 5.2 | 2.0 | 5,567.3 |
| **Maximum On-site Emissions** | **5** | **32** | **23** | **-** | **5** | **2** | **5,567** |
| Localized Significance Threshold[b] | -- | 45 | 735 | -- | 27 | 4 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Site Prep | 5.3 | 40.4 | 28.2 | - | 5.8 | 2.5 | 8,709.9 |
| Tank Installation | 4.5 | 31.7 | 20.9 | - | 5.2 | 2.1 | 5,753.7 |
| **Maximum Regional Emissions** | **5** | **40** | **28** | **-** | **6** | **2** | **8,710** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

MITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 0.63 | 5.18 | 23.35 | - | 4.55 | 1.41 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 3.91 | 0.82 | - |
| Off-Road Diesel | 0.63 | 5.18 | 23.35 | - | 0.64 | 0.59 | 5,101.66 |
| Off-site Total | 0.93 | 9.45 | 4.82 | - | 0.46 | 0.35 | 3,608.20 |
| On-Road Diesel | 0.90 | 9.40 | 3.78 | - | 0.44 | 0.34 | 3,390.72 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **1.56** | **14.63** | **28.17** | **-** | **5.01** | **1.76** | **8,709.86** |
| **Tank Installation** | | | | | | | |
| On-site Total | 0.66 | 5.28 | 20.05 | - | 4.46 | 1.33 | 5,567.33 |
| Fugitive Dust | - | - | - | - | 3.91 | 0.82 | - |
| Off-Road Diesel | 0.66 | 5.28 | 20.05 | - | 0.55 | 0.51 | 5,567.33 |
| Off-site Total | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| **Grand Total** | **0.68** | **5.33** | **20.94** | **-** | **4.47** | **1.34** | **5,753.74** |
| **On-site Emissions Totals** | | | | | | | |
| Site Prep | 0.6 | 5.2 | 23.4 | - | 4.5 | 1.4 | 5,101.7 |
| Tank Installation | 0.7 | 5.3 | 20.1 | - | 4.5 | 1.3 | 5,567.3 |
| **Maximum On-site Emissions** | **1** | **5** | **23** | **-** | **5** | **1** | **5,567** |
| Localized Significance Threshold[b] | -- | 45 | 735 | -- | 27 | 4 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Site Prep | 1.6 | 14.6 | 28.2 | - | 5.0 | 1.8 | 8,709.9 |
| Tank Installation | 0.7 | 5.3 | 20.9 | - | 4.5 | 1.3 | 5,753.7 |
| **Maximum Regional Emissions** | **2** | **15** | **28** | **-** | **5** | **2** | **8,710** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

**4/27/2010 8:32:52 AM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\San Diego\10_Staff\Air Quality Staff\clearwater\Analysis\URBEMIS\Process Optimization\LCWRP.urb924

Project Name: LCWRP Process Optimization

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 TOTALS (lbs/day unmitigated) | 5.28 | 40.41 | 28.17 | 0.03 | 15.89 | 1.73 | 17.62 | 3.33 | 1.59 | 4.93 | 8,709.86 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/1/2018-1/1/2018 Active Days: 1 | **5.28** | **40.41** | **28.17** | **0.03** | **15.89** | **1.73** | **17.62** | **3.33** | **1.59** | **4.93** | **8,709.86** |
| Mass Grading 01/01/2018-01/01/2018 | 5.28 | 40.41 | 28.17 | 0.03 | 15.89 | 1.73 | 17.62 | 3.33 | 1.59 | 4.93 | 8,709.86 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 15.76 | 0.00 | 15.76 | 3.29 | 0.00 | 3.29 | 0.00 |
| Mass Grading Off Road Diesel | 4.35 | 30.96 | 23.35 | 0.00 | 0.00 | 1.40 | 1.40 | 0.00 | 1.29 | 1.29 | 5,101.66 |
| Mass Grading On Road Diesel | 0.90 | 9.40 | 3.78 | 0.03 | 0.11 | 0.33 | 0.44 | 0.04 | 0.30 | 0.34 | 3,390.72 |
| Mass Grading Worker Trips | 0.03 | 0.05 | 1.04 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | 0.01 | 217.48 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/2/2018-1/2/2018 Active Days: 1 | 4.53 | 31.66 | 20.94 | 0.00 | 15.77 | 1.33 | 17.10 | 3.30 | 1.22 | 4.52 | 5,753.75 |
| Mass Grading 01/02/2018-01/02/2018 | 4.53 | 31.66 | 20.94 | 0.00 | 15.77 | 1.33 | 17.10 | 3.30 | 1.22 | 4.52 | 5,753.75 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 15.76 | 0.00 | 15.76 | 3.29 | 0.00 | 3.29 | 0.00 |
| Mass Grading Off Road Diesel | 4.50 | 31.61 | 20.05 | 0.00 | 0.00 | 1.32 | 1.32 | 0.00 | 1.22 | 1.22 | 5,567.33 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.02 | 0.05 | 0.89 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 186.41 |

Phase Assumptions

Phase: Mass Grading 1/1/2018 - 1/1/2018 - Tank Site Work

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 1.29

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 800

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/2/2018 - 1/2/2018 - Tank Installation

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 1.29

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

**4/27/2010 8:32:52 AM**

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

# URBEMIS EMISISONS SUMMARY FOR ONSITE AND REGIONAL CONSTRUCTION ACTIVITIES

**SJCWRP Process Optimization**

UNMITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 4.35 | 30.96 | 23.35 | - | 8.24 | 2.72 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 6.84 | 1.43 | - |
| Off-Road Diesel | 4.35 | 30.96 | 23.35 | - | 1.40 | 1.29 | 5,101.66 |
| Off-site Total | 1.05 | 10.73 | 5.33 | 0.04 | 0.52 | 0.39 | 4,070.57 |
| On-Road Diesel | 1.02 | 10.68 | 4.29 | 0.04 | 0.50 | 0.38 | 3,853.09 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **5.40** | **41.69** | **28.68** | **0.04** | **8.76** | **3.11** | **9,172.23** |
| **Tank Installation** | | | | | | | |
| On-site Total | 4.50 | 31.61 | 20.05 | - | 8.16 | 2.65 | 5,567.33 |
| Fugitive Dust | | | | | 6.84 | 1.43 | |
| Off-Road Diesel | 4.50 | 31.61 | 20.05 | - | 1.32 | 1.22 | 5,567.33 |
| Off-site Total | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| **Grand Total** | **4.52** | **31.66** | **20.94** | **-** | **8.17** | **2.66** | **5,753.74** |
| **On-site Emissions Totals** | | | | | | | |
| Site Prep | 4.4 | 31.0 | 23.4 | - | 8.2 | 2.7 | 5,101.7 |
| Tank Installation | 4.5 | 31.6 | 20.1 | - | 8.2 | 2.7 | 5,567.3 |
| **Maximum On-site Emissions** | **5** | **32** | **23** | **-** | **8** | **3** | **5,567** |
| Localized Significance Threshold[b] | -- | 46 | 673 | -- | 13 | 5 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Site Prep | 5.4 | 41.7 | 28.7 | 0.0 | 8.8 | 3.1 | 9,172.2 |
| Tank Installation | 4.5 | 31.7 | 20.9 | - | 8.2 | 2.7 | 5,753.7 |
| **Maximum Regional Emissions** | **5** | **42** | **29** | **0** | **9** | **3** | **9,172** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

MITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 0.63 | 5.18 | 23.35 | - | 7.48 | 2.02 | 5,101.66 |
| Fugitive Dust | - | - | - | - | 6.84 | 1.43 | - |
| Off-Road Diesel | 0.63 | 5.18 | 23.35 | - | 0.64 | 0.59 | 5,101.66 |
| Off-site Total | 1.05 | 10.73 | 5.33 | 0.04 | 0.52 | 0.39 | 4,070.57 |
| On-Road Diesel | 1.02 | 10.68 | 4.29 | 0.04 | 0.50 | 0.38 | 3,853.09 |
| Worker Trips | 0.03 | 0.05 | 1.04 | - | 0.02 | 0.01 | 217.48 |
| **Grand Total** | **1.68** | **15.91** | **28.68** | **0.04** | **8.00** | **2.41** | **9,172.23** |
| **Tank Installation** | | | | | | | |
| On-site Total | 0.66 | 5.28 | 20.05 | - | 7.39 | 1.94 | 5,567.33 |
| Fugitive Dust | - | - | - | - | 6.84 | 1.43 | - |
| Off-Road Diesel | 0.66 | 5.28 | 20.05 | - | 0.55 | 0.51 | 5,567.33 |
| Off-site Total | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | 0.02 | 0.05 | 0.89 | - | 0.01 | 0.01 | 186.41 |
| **Grand Total** | **0.68** | **5.33** | **20.94** | **-** | **7.40** | **1.95** | **5,753.74** |
| **On-site Emissions Totals** | | | | | | | |
| Demolition | 0.6 | 5.2 | 23.4 | - | 7.5 | 2.0 | 5,101.7 |
| Site Grading | 0.7 | 5.3 | 20.1 | - | 7.4 | 1.9 | 5,567.3 |
| **Maximum On-site Emissions** | **1** | **5** | **23** | **-** | **7** | **2** | **5,567** |
| Localized Significance Threshold[b] | -- | 46 | 673 | -- | 13 | 5 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Demolition | 1.7 | 15.9 | 28.7 | 0.0 | 8.0 | 2.4 | 9,172.2 |
| Site Grading | 0.7 | 5.3 | 20.9 | - | 7.4 | 2.0 | 5,753.7 |
| **Maximum Regional Emissions** | **2** | **16** | **29** | **0** | **8** | **2** | **9,172** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

**3/30/2010 11:10:17 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\Clearwater\Analysis\URBEMIS\Process Optimization\san jose creek wrp.urb924

Project Name: SJCWRP Process Optimization

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 TOTALS (lbs/day unmitigated) | 5.40 | 41.69 | 28.68 | 0.04 | 27.39 | 1.78 | 29.17 | 5.74 | 1.63 | 7.37 | 9,172.23 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/1/2018-1/1/2018 Active Days: 1 | **5.40** | **41.69** | **28.68** | **0.04** | **27.39** | **1.78** | **29.17** | **5.74** | **1.63** | **7.37** | **9,172.23** |
| Mass Grading 01/01/2018-01/01/2018 | 5.40 | 41.69 | 28.68 | 0.04 | 27.39 | 1.78 | 29.17 | 5.74 | 1.63 | 7.37 | 9,172.23 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 27.25 | 0.00 | 27.25 | 5.69 | 0.00 | 5.69 | 0.00 |
| Mass Grading Off Road Diesel | 4.35 | 30.96 | 23.35 | 0.00 | 0.00 | 1.40 | 1.40 | 0.00 | 1.29 | 1.29 | 5,101.66 |
| Mass Grading On Road Diesel | 1.02 | 10.68 | 4.29 | 0.04 | 0.13 | 0.37 | 0.50 | 0.04 | 0.34 | 0.38 | 3,853.09 |
| Mass Grading Worker Trips | 0.03 | 0.05 | 1.04 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | 0.01 | 217.48 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/2/2018-1/2/2018 Active Days: 1 | 4.53 | 31.66 | 20.94 | 0.00 | 27.26 | 1.33 | 28.59 | 5.69 | 1.22 | 6.92 | 5,753.75 |
| Mass Grading 01/02/2018-01/02/2018 | 4.53 | 31.66 | 20.94 | 0.00 | 27.26 | 1.33 | 28.59 | 5.69 | 1.22 | 6.92 | 5,753.75 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 27.25 | 0.00 | 27.25 | 5.69 | 0.00 | 5.69 | 0.00 |
| Mass Grading Off Road Diesel | 4.50 | 31.61 | 20.05 | 0.00 | 0.00 | 1.32 | 1.32 | 0.00 | 1.22 | 1.22 | 5,567.33 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.02 | 0.05 | 0.89 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 186.41 |

Phase Assumptions

Phase: Mass Grading 1/1/2018 - 1/1/2018 - Tank Site Work

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 2.23

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 909.09

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/2/2018 - 1/2/2018 - Tank Installation

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 2.23

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

**3/30/2010 11:10:18 PM**

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

# URBEMIS EMISISONS SUMMARY FOR ONSITE AND REGIONAL CONSTRUCTION ACTIVITIES

**SJCWRP Plant Expansion**

UNMITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 3.43 | 23.53 | 17.93 | - | 11.73 | 3.15 | 4,715.67 |
| Fugitive Dust | - | - | - | - | 10.75 | 2.25 | - |
| Off-Road Diesel | 3.43 | 23.53 | 17.93 | - | 0.98 | 0.90 | 4,715.67 |
| Off-site Total | 0.75 | 6.44 | 3.12 | 0.05 | 0.36 | 0.23 | 5,272.48 |
| On-Road Diesel | 0.74 | 6.42 | 2.75 | 0.05 | 0.35 | 0.22 | 5,086.08 |
| Worker Trips | 0.01 | 0.02 | 0.37 | - | 0.01 | 0.01 | 186.40 |
| **Grand Total** | **4.18** | **29.97** | **21.05** | **0.05** | **12.09** | **3.38** | **9,988.15** |
| **Install** | | | | | | | |
| On-site Total | 0.31 | 1.97 | 2.93 | - | 10.86 | 2.35 | 458.26 |
| Fugitive Dust | | | | | 10.75 | 2.25 | |
| Off-Road Diesel | 0.31 | 1.97 | 2.93 | - | 0.11 | 0.10 | 458.26 |
| Off-site Total | - | 0.01 | 0.12 | - | - | - | 62.13 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | - | 0.01 | 0.12 | - | - | - | 62.13 |
| **Grand Total** | **0.31** | **1.98** | **3.05** | **-** | **10.86** | **2.35** | **520.39** |
| **On-site Emissions Totals** | | | | | | | |
| Site Prep | 3.4 | 23.5 | 17.9 | - | 11.7 | 3.2 | 4,715.7 |
| Install | 0.3 | 2.0 | 2.9 | - | 10.9 | 2.4 | 458.3 |
| **Maximum On-site Emissions** | **3** | **24** | **18** | **-** | **12** | **3** | **4,716** |
| Localized Significance Threshold[b] | -- | 53 | 1,113 | -- | 29 | 9 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Site Prep | 4.2 | 30.0 | 21.1 | 0.1 | 12.1 | 3.4 | 9,988.2 |
| Install | 0.3 | 2.0 | 3.1 | - | 10.9 | 2.4 | 520.4 |
| **Maximum Regional Emissions** | **4** | **30** | **21** | **0** | **12** | **3** | **9,988** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

MITIGATED CONSTRUCTION EMISSIONS (pounds per day)

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ |
|---|---|---|---|---|---|---|---|
| **Site Prep** | | | | | | | |
| On-site Total | 0.50 | 3.93 | 17.93 | - | 11.18 | 2.65 | 4,715.67 |
| Fugitive Dust | - | - | - | - | 10.75 | 2.25 | - |
| Off-Road Diesel | 0.50 | 3.93 | 17.93 | - | 0.43 | 0.40 | 4,715.67 |
| Off-site Total | 0.75 | 6.44 | 3.12 | 0.05 | 0.36 | 0.23 | 5,272.48 |
| On-Road Diesel | 0.74 | 6.42 | 2.75 | 0.05 | 0.35 | 0.22 | 5,086.08 |
| Worker Trips | 0.01 | 0.02 | 0.37 | - | 0.01 | 0.01 | 186.40 |
| **Grand Total** | **1.25** | **10.37** | **21.05** | **0.05** | **11.54** | **2.88** | **9,988.15** |
| **Install** | | | | | | | |
| On-site Total | 0.04 | 0.33 | 2.93 | - | 10.81 | 2.31 | 458.26 |
| Fugitive Dust | - | - | - | - | 10.75 | 2.25 | - |
| Off-Road Diesel | 0.04 | 0.33 | 2.93 | - | 0.06 | 0.06 | 458.26 |
| Off-site Total | - | 0.01 | 0.12 | - | - | - | 62.13 |
| On-Road Diesel | - | - | - | - | - | - | - |
| Worker Trip | - | 0.01 | 0.12 | - | - | - | 62.13 |
| **Grand Total** | **0.04** | **0.34** | **3.05** | **-** | **10.81** | **2.31** | **520.39** |
| **On-site Emissions Totals** | | | | | | | |
| Demolition | 0.5 | 3.9 | 17.9 | - | 11.2 | 2.6 | 4,715.7 |
| Site Grading | 0.0 | 0.3 | 2.9 | - | 10.8 | 2.3 | 458.3 |
| **Maximum On-site Emissions** | **1** | **4** | **18** | **-** | **11** | **3** | **4,716** |
| Localized Significance Threshold[b] | -- | 53 | 1,113 | -- | 29 | 9 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| **Regional Emissions Totals** | | | | | | | |
| Demolition | 1.3 | 10.4 | 21.1 | 0.1 | 11.5 | 2.9 | 9,988.2 |
| Site Grading | 0.0 | 0.3 | 3.1 | - | 10.8 | 2.3 | 520.4 |
| **Maximum Regional Emissions** | **1** | **10** | **21** | **0** | **12** | **3** | **9,988** |
| Regional Significance Threshold | 75 | 100 | 550 | 150 | 150 | 55 | -- |
| **Exceed Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** | **No** |

**6/2/2011 2:40:31 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\San Diego\10_Staff\Air Quality Staff\LACSD Clearwater\Construction\Construction_URBEMIS runs\SJCWRP Plant Expansion_year 2035.urb924

Project Name: SJCWRP Plant Expansion

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2035 TOTALS (lbs/day unmitigated) | 4.18 | 29.97 | 21.05 | 0.05 | 10.93 | 1.17 | 12.10 | 2.30 | 1.07 | 3.38 | 9,988.15 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**6/2/2011 2:40:31 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 1/1/2035-1/1/2035 Active Days: 1 | **4.18** | **29.97** | **21.05** | **0.05** | **10.93** | **1.17** | **12.10** | **2.30** | **1.07** | **3.38** | **9,988.15** |
| Mass Grading 01/01/2035-01/01/2035 | 4.18 | 29.97 | 21.05 | 0.05 | 10.93 | 1.17 | 12.10 | 2.30 | 1.07 | 3.38 | 9,988.15 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 10.75 | 0.00 | 10.75 | 2.25 | 0.00 | 2.25 | 0.00 |
| Mass Grading Off Road Diesel | 3.43 | 23.53 | 17.93 | 0.00 | 0.00 | 0.98 | 0.98 | 0.00 | 0.90 | 0.90 | 4,715.67 |
| Mass Grading On Road Diesel | 0.74 | 6.42 | 2.75 | 0.05 | 0.17 | 0.18 | 0.35 | 0.06 | 0.17 | 0.22 | 5,086.08 |
| Mass Grading Worker Trips | 0.01 | 0.02 | 0.37 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 186.40 |
| Time Slice 1/2/2035-1/2/2035 Active Days: 1 | 0.31 | 1.98 | 3.05 | 0.00 | 10.76 | 0.11 | 10.87 | 2.25 | 0.10 | 2.35 | 520.39 |
| Mass Grading 01/02/2035-01/02/2035 | 0.31 | 1.98 | 3.05 | 0.00 | 10.76 | 0.11 | 10.87 | 2.25 | 0.10 | 2.35 | 520.39 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 10.75 | 0.00 | 10.75 | 2.25 | 0.00 | 2.25 | 0.00 |
| Mass Grading Off Road Diesel | 0.31 | 1.97 | 2.93 | 0.00 | 0.00 | 0.11 | 0.11 | 0.00 | 0.10 | 0.10 | 458.26 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.00 | 0.01 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 62.13 |

Phase Assumptions

Phase: Mass Grading 1/1/2035 - 1/1/2035 - Site Prep

Total Acres Disturbed: 3.54

Maximum Daily Acreage Disturbed: 0.88

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 1200

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

**6/2/2011 2:40:31 PM**

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/2/2035 - 1/2/2035 - Install

Total Acres Disturbed: 3.54

Maximum Daily Acreage Disturbed: 0.88

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

**Program Construction**

# OFFROAD Emission Reductions

JWPCP Solids Processing

**Phase I**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 2 | Excavators | 168 | 336 | 18% | 72% | 86% | 44% | 13% | 16% | 8% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 9% | 72% | 86% | 44% | 7% | 8% | 4% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equipment | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipment | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Rubber Tired Dozers | 357 | 714 | 39% | 72% | 85% | 61% | 28% | 33% | 24% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 1 | Scrapers | 313 | 313 | 17% | 72% | 85% | 61% | 12% | 15% | 10% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 6% | 72% | 86% | 44% | 4% | 5% | 3% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 10% | 72% | 85% | 62% | 7% | 9% | 6% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **8** | **Piece(s) of Equipment** | **Total HP** | **1834** | **100%** | | | | **72%** | **85%** | **55%** |

**Phase II**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Cranes | 399 | 399 | 44% | 72% | 85% | 61% | 32% | 38% | 27% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Excavators | 168 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Forklifts | 145 | 290 | 32% | 72% | 86% | 44% | 23% | 28% | 14% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Graders | 174 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equipment | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipment | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rubber Tired Dozers | 357 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 2 | Tractors/Loaders/Backhoes | 108 | 216 | 24% | 72% | 86% | 44% | 17% | 20% | 11% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Water Trucks | 189 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **5** | **Piece(s) of Equipment** | **Total HP** | **905** | **100%** | | | | **72%** | **86%** | **52%** |

Source for reductions: http://www.aqmd.gov/ceqa/handbook/mitigation/offroad/TableII.xls

**Program Construction**

# OFFROAD Emission Reductions

LBWRP Process Optimization

**Phase I**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 2 | Excavators | 168 | 336 | 22% | 72% | 86% | 44% | 16% | 19% | 10% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 11% | 72% | 86% | 44% | 8% | 10% | 5% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equipment | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipment | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Rubber Tired Dozers | 357 | 714 | 47% | 72% | 85% | 61% | 34% | 40% | 29% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 7% | 72% | 86% | 44% | 5% | 6% | 3% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 12% | 72% | 85% | 62% | 9% | 11% | 8% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **7** | **Piece(s) of Equipment** | **Total HP** | **1521** | **100%** | | | | **72%** | **85%** | **54%** |

**Phase II**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Excavators | 168 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 10% | 72% | 86% | 44% | 8% | 9% | 5% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 1 | Off Highway Trucks | 479 | 479 | 29% | 72% | 85% | 61% | 21% | 25% | 17% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equipment | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipment | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Rubber Tired Dozers | 357 | 714 | 43% | 72% | 85% | 61% | 31% | 37% | 26% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 6% | 72% | 86% | 44% | 5% | 6% | 3% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 11% | 72% | 85% | 62% | 8% | 10% | 7% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **6** | **Piece(s) of Equipment** | **Total HP** | **1664** | **100%** | | | | **72%** | **85%** | **58%** |

**Program Construction**

# OFFROAD Emission Reductions

POWRP Process Optimization

**Phase I**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Excavators | 168 | 168 | 17% | 72% | 86% | 44% | 12% | 14% | 7% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 17% | 72% | 86% | 44% | 13% | 15% | 8% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 1 | Rubber Tired Dozers | 357 | 357 | 36% | 72% | 85% | 61% | 26% | 31% | 22% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 11% | 72% | 86% | 44% | 8% | 9% | 5% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 19% | 72% | 85% | 62% | 14% | 16% | 12% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **5** | **Piece(s) of Equipment** | **Total HP** | **996** | **100%** | | | | **72%** | **85%** | **54%** |

**Phase II**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Excavators | 168 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 13% | 72% | 86% | 44% | 10% | 11% | 6% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 1 | Off Highway Trucks | 479 | 479 | 37% | 72% | 85% | 61% | 26% | 31% | 22% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 1 | Rubber Tired Dozers | 357 | 357 | 27% | 72% | 85% | 61% | 20% | 23% | 17% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 8% | 72% | 86% | 44% | 6% | 7% | 4% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 14% | 72% | 85% | 62% | 10% | 12% | 9% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **5** | **Piece(s) of Equipment** | **Total HP** | **1307** | **100%** | | | | **72%** | **85%** | **57%** |

**Program Construction**

# OFFROAD Emission Reductions

LCWRP Process Optimization

**Phase I**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 2 | Excavators | 168 | 336 | 22% | 72% | 86% | 44% | 16% | 19% | 10% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 11% | 72% | 86% | 44% | 8% | 10% | 5% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Rubber Tired Dozers | 357 | 714 | 47% | 72% | 85% | 61% | 34% | 40% | 29% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 7% | 72% | 86% | 44% | 5% | 6% | 3% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 12% | 72% | 85% | 62% | 9% | 11% | 8% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **7** | **Piece(s) of Equipment** | **Total HP** | **1521** | **100%** | | | | **72%** | **85%** | **54%** |

**Phase II**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Excavators | 168 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 10% | 72% | 86% | 44% | 8% | 9% | 5% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 1 | Off Highway Trucks | 479 | 479 | 29% | 72% | 85% | 61% | 21% | 25% | 17% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Rubber Tired Dozers | 357 | 714 | 43% | 72% | 85% | 61% | 31% | 37% | 26% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 6% | 72% | 86% | 44% | 5% | 6% | 3% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 11% | 72% | 85% | 62% | 8% | 10% | 7% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **6** | **Piece(s) of Equipment** | **Total HP** | **1664** | **100%** | | | | **72%** | **85%** | **58%** |

**Program Construction**

# OFFROAD Emission Reductions

SJCWRP Process Optimization

**Phase I**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 2 | Excavators | 168 | 336 | 22% | 72% | 86% | 44% | 16% | 19% | 10% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 11% | 72% | 86% | 44% | 8% | 10% | 5% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Rubber Tired Dozers | 357 | 714 | 47% | 72% | 85% | 61% | 34% | 40% | 29% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 7% | 72% | 86% | 44% | 5% | 6% | 3% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 12% | 72% | 85% | 62% | 9% | 11% | 8% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **7** | **Piece(s) of Equipment** | **Total HP** | **1521** | **100%** | | | | **72%** | **85%** | **54%** |

**Phase II - Site Grading**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Excavators | 168 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 10% | 72% | 86% | 44% | 8% | 9% | 5% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 1 | Off Highway Trucks | 479 | 479 | 29% | 72% | 85% | 61% | 21% | 25% | 17% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 2 | Rubber Tired Dozers | 357 | 714 | 43% | 72% | 85% | 61% | 31% | 37% | 26% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 6% | 72% | 86% | 44% | 5% | 6% | 3% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 11% | 72% | 85% | 62% | 8% | 10% | 7% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **6** | **Piece(s) of Equipment** | **Total HP** | **1664** | **100%** | | | | **72%** | **85%** | **58%** |

**Program Construction**

# OFFROAD Emission Reductions

SJCWRP Plant Expansion

**Phase I**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Excavators | 168 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Forklifts | 145 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Graders | 174 | 174 | 14% | 72% | 86% | 44% | 10% | 12% | 6% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 1 | Rubber Tired Dozers | 357 | 357 | 29% | 72% | 85% | 61% | 21% | 24% | 17% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 1 | Scrapers | 313 | 313 | 25% | 72% | 85% | 61% | 18% | 21% | 15% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 2 | Tractors/Loaders/Backhoes | 108 | 216 | 17% | 72% | 86% | 44% | 12% | 15% | 8% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Water Trucks | 189 | 189 | 15% | 72% | 85% | 62% | 11% | 13% | 9% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **6** | **Piece(s) of Equipment** | **Total HP** | **1249** | **100%** | | | | **72%** | **85%** | **56%** |

**Phase II**

| Quantity | Equipment | Unit HP | Total HP | Weighting | Actual Emissions Reductions (percent) | | | Weighted Emissions Reductions (percent) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NOx | ROG | PM | NOx | ROG | PM |
| 0 | Aerial Lifts | 60 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Air Compressors | 106 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Bore/Drill Rigs | 291 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Cement and Mortar Mixers | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Concrete/Industrial Saws | 10 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Cranes | 399 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Crawler Tractor | 147 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Crushing/Processing Equip | 142 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Dumpers/Tenders | 16 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Excavators | 168 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 1 | Forklifts | 145 | 145 | 57% | 72% | 86% | 44% | 41% | 49% | 25% |
| 0 | Generator Sets | 49 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Graders | 174 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Off Highway Tractors | 267 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Off Highway Trucks | 479 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Other Equipment | 190 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other General Light Industrial Equi | 238 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Other Material Handling Equipmen | 191 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Pavers | 100 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Paving Equipment | 104 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Plate Compactors | 8 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pressure Washers | 1 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Pumps | 53 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Rollers | 95 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rough Terrain Forklifts | 93 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Rubber Tired Dozers | 357 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Rubber Tired Loaders | 164 | 0 | 0% | 72% | 86% | 44% | 0% | 0% | 0% |
| 0 | Scrapers | 313 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Signal Boards | 15 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Skid Steer Loaders | 44 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Surfacing Equipment | 362 | 0 | 0% | 72% | 85% | 61% | 0% | 0% | 0% |
| 0 | Sweepers/Scrubbers | 91 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 1 | Tractors/Loaders/Backhoes | 108 | 108 | 43% | 72% | 86% | 44% | 31% | 37% | 19% |
| 0 | Trenchers | 63 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| 0 | Water Trucks | 189 | 0 | 0% | 72% | 85% | 62% | 0% | 0% | 0% |
| 0 | Welders | 45 | 0 | 0% | 72% | 90% | 50% | 0% | 0% | 0% |
| **2** | **Piece(s) of Equipment** | **Total HP** | **253** | **100%** | | | | **72%** | **86%** | **44%** |

# Program Operations Calculations

**Program Operations**

# JWPCP STATIONARY SOURCE CALCULATIONS

**Methodology**

Emission Factors for stationary sources from LACSD for 2008 and per SCAQMD rules in future years
future year emission factors are assumed to be the same, except for NOx emission factors, which are lower to abide by SCAQMD BACT's
Existing emissions based on 2008 AER, divided by 365.25 days to get average daily emissions

**Scaling**

4.73 MGD capacity of anaerobic digestion system - EXISTING
5.82 MGD capacity of anaerobic digestion system - 2050
23% increase in solids handling

3,178.87 mmscf gas used in 2008
3,910.01 mmscf projected based on increase in flow
731.14 net increase in gas, all sent to flares

| constants | |
|---|---|
| days per year | 365.25 |
| PM10 of PM | 0.994 |
| PM2.5 of PM | 0.992 |
| | |
| for flares | |
| PM2.5 of PM | 1.00 |

**Emissions from the Annual Emissions Report for JWPCP (from the AER, to get Baseline**

| | | | 2008 AER Emissions pounds per year | | | | |
|---|---|---|---|---|---|---|---|
| | **Device Description** | **Annual Usage** | **Organic Gases** | **NOx** | **SOx** | **CO** | **PM** |
| *B1 - Permitted Annual Emissions from Fuel Combustion in Boilers, Ovens, Furnaces, and Heaters* | Digester Gas Boilers | 534.58 | 5,757 | 9,777 | 1,924 | 91 | 4,956 |
| | Flare Stations | 1.05 | 2 | 38 | 4 | 7 | 5 |
| | Standby Boiler | 2.16 | 12 | 47 | 1 | 16 | 16 |
| | Laboratory Boilers | 11.91 | 66 | 105 | 7 | 412 | 91 |
| | Portable Pressure Washer - Diesel | 0.6 | 0 | 1 | 0 | 0 | 0 |
| *B1U - Non-permitted Annual Emissions from Fuel Combustion in Boilers, Ovens, Furnaces, and Heaters* | Hot Water Heater - nat. gas | 2.96 | 16 | 296 | 2 | 249 | 23 |
| *B2 - Permitted Annual Emissions from Fuel Combustion - Internal Combustion Engines and Turbines* | Stationary Turbines | 2851.7 | 4,933 | 146,463 | 9,639 | 104,372 | 37,899 |
| | SIPS | 155.93 | 917 | 352 | 94 | 10,605 | 1,559 |
| | PEPS | 1.52 | 35 | 205 | 5 | 242 | 17 |
| | Stationary Diesel Engines | 0.08 | 3 | 39 | 0 | 8 | 3 |
| | Stationary Diesel Engines Lab Annex | 0.01 | 0 | 2 | 0 | 1 | 0 |
| *B2U - Non-permitted Annual Emissions from Fuel Combustion - Internal Combustion Engines and Turbines* | Portable Diesel Engines | 2.82 | 106 | 1,323 | 1 | 288 | 95 |
| | Portable Gasoline Powered Engines | 2.85 | 587 | 291 | 15 | 11,229 | 19 |
| *B3 - Permitted Annual Emissions from the Use of Organics* | All Organics | NA | 815 | 0 | 0 | 0 | 0 |
| *B4 - Permitted Annual Equipment Emissions from Miscellaneous Sources* | Sewage and wastewater treatment | 108167.74 | 35,555 | 0 | 21,201 | 0 | 0 |
| | Gasoline Storage and Dispensing | 44.19 | 80 | 0 | 0 | 0 | 0 |
| *B4U - Non-permitted Annual Equipment Emissions from Miscellaneous Sources* | Laboratory Solvents | 2000 | 297 | 0 | 0 | 0 | 0 |
| | Cooling Towers | 0.05 | 0 | 0 | 0 | 0 | 343 |
| | Diesel Storage and Dispensing | 53 | 1 | 0 | 0 | 0 | 0 |
| | **Total** | | **49,181** | **158,940** | **32,893** | **127,520** | **45,024** |

**Emissions from Increased Digester Gas**

23% increase in solids handling
3,178.87 mmscf gas used in 2008
3,910.01 mmscf projected based on increase in flow
731.14 net increase in gas, all assumed to be combusted using worst-case flare or boiler emission factors

Emission Factors in lb/mmcf for JWPCP Digester Gas
(From 2008 Emissions Report Unless Otherwise Noted)

| | VOC | NOx | SOx | CO | PM | |
|---|---|---|---|---|---|---|
| Boilers | 10.77 | 11.79 | 3.6 | 0.17 | 9.27 | NOx EF from Rule 1146 |
| Flares | 1.72 | 36.23 | 3.6 | 7.13 | 4.93 | |
| worse case | 10.77 | 36.23 | 3.6 | 7.13 | 9.27 | (multiply worst-case EF by net increase in digester gas) |
| Emissions (pounds/yr) | 7874.4 | 26489.2 | 2632.1 | 5213.0 | 6737.0 | 6737.0 |
| Emissions (pounds/day) | 21.6 | 72.5 | 7.2 | 14.3 | 18.4 | 18.4 |

**Emissions from other stationary sources**

| | Existing (pounds per day) | | | | | | | Project 2050 (pounds per day) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Form** | **VOC** | **CO** | **NOx** | **SOx** | **PM10** | **PM2.5** | **scale?** | **VOC** | **CO** | **NOx** | **SOx** | **PM10** | **PM2.5** |
| Digester Gas Boilers | 15.8 | 0.2 | 26.8 | 5.3 | 13.5 | 13.4 | No | 15.8 | 0.2 | 26.8 | 5.3 | 13.5 | 13.4 |
| Flare Stations | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | No | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Standby Boiler | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | No | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Laboratory Boilers | 0.2 | 1.1 | 0.3 | 0.0 | 0.2 | 0.2 | No | 0.2 | 1.1 | 0.3 | 0.0 | 0.2 | 0.2 |
| Portable Pressure Washer - Diesel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | No | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hot Water Heater - nat. gas | 0.0 | 0.7 | 0.8 | 0.0 | 0.1 | 0.1 | No | 0.0 | 0.7 | 0.8 | 0.0 | 0.1 | 0.1 |
| Stationary Turbines | 13.5 | 285.8 | 401.0 | 26.4 | 103.1 | 102.3 | No | 13.5 | 285.8 | 401.0 | 26.4 | 103.1 | 102.3 |
| SIPS | 2.5 | 29.0 | 1.0 | 0.3 | 4.2 | 4.2 | No | 2.5 | 29.0 | 1.0 | 0.3 | 4.2 | 4.2 |
| PEPS | 0.1 | 0.7 | 0.6 | 0.0 | 0.0 | 0.0 | No | 0.1 | 0.7 | 0.6 | 0.0 | 0.0 | 0.0 |
| Stationary Diesel Engines | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | No | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Stationary Diesel Engines Lab Annex | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | No | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Portable Diesel Engines | 0.3 | 0.8 | 3.6 | 0.0 | 0.3 | 0.3 | No | 0.3 | 0.8 | 3.6 | 0.0 | 0.3 | 0.3 |
| Portable Gasoline Powered Engines | 1.6 | 30.7 | 0.8 | 0.0 | 0.1 | 0.1 | No | 1.6 | 30.7 | 0.8 | 0.0 | 0.1 | 0.1 |
| All Organics | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | No | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sewage and wastewater treatment | - | 0.0 | 0.0 | 58.0 | 0.0 | 0.0 | Yes | - | 0.0 | 0.0 | 71.4 | 0.0 | 0.0 |
| Gasoline Storage and Dispensing | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | No | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Laboratory Solvents | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | No | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cooling Towers | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.9 | No | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.9 |
| Diesel Storage and Dispensing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | No | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| total from above | 37.3 | 349.1 | 435.2 | 90.1 | 122.5 | 121.6 | | 37.3 | 349.1 | 435.2 | 103.4 | 122.5 | 121.6 |
| Extra Digester Gas | | | | | | | | 21.6 | 14.3 | 72.5 | 7.2 | 18.4 | 18.4 |
| Wastewater VOCs | **98.3** | | | | | | | 100.1 | | | | | |
| **Total** | **135.6** | **349.1** | **435.2** | **90.1** | **122.5** | **121.6** | | **158.9** | **363.4** | **507.7** | **110.6** | **141.0** | **140.0** |

**Program Operations**

# JWPCP WASTEWATER TREATMENT ROG/VOC EMISSION CALCULATIONS

| Process | 1993 Partial Secondary Facility JEIP lb/yr | 2008 Full Secondary Facility Estimate lb/yr | notes | Scale to 2050? | 2050 | |
|---|---|---|---|---|---|---|
| Headworks - Ducted | 7195.23 | 7307 | 1 | No | 7,307 | |
| Septage Dumping Facility | 162.19 | 164.7 | 1 | No | 164.7 | |
| Grit Removal - Aerated | 1223.08 | 1242 | 1 | No | 1,242 | |
| Primary Sed. Tanks | 1877 | 1906 | 1 | No | 1,906 | |
| Skimmings Concentration | 22.97 | 23.3 | 1 | No | 23.3 | |
| Secondary Influent Channel | | 317.5 | 2 | No | 317.5 | |
| Pure Oxygen Reactors | | 16005 | 2 | No | 16,005 | |
| Mixed Liquor Channel | | 753.9 | 2 | No | 753.9 | |
| Secondary Clarifiers | 1446.17 | 5286.7 | 2 | No | 5,286.7 | net |
| DAF | 69.02 | **136.6** | 3 | Yes | **168.0** | *31* |
| Digester Leaks | 4.2 | **5.0** | 4 | Yes | **6.1** | *1* |
| Centrifuges | 285.07 | **337.3** | 4 | Yes | **414.9** | *78* |
| Conveyor Belts | 1.52 | **1.8** | 4 | Yes | **2.2** | *0* |
| Cake Storage | 258.28 | **305.6** | 4 | Yes | **375.9** | *70* |
| Truck Loading Operations | 2.37 | **2.8** | 4 | Yes | **3.4** | *1* |
| Digester Cleanings Storage | 54.25 | **64.2** | 4 | Yes | **78.9** | *15* |
| Digester Cleaning Buildings | 138.84 | **164.3** | 4 | Yes | **202.1** | *38* |
| Sludge Screening | 1577.36 | **1866** | 4 | Yes | **2,295** | *429* |
| | | | | | | 663 |
| Plant Flow During Testing | 291 | 296 | MGD | | | |
| Plant Secondary Flow | 200 | 296 | MGD | | | |
| Average Number of Secondary Treatment Reactors in Service: | | 6.33 | | | | |
| **Full Secondary Base Year Sum:** | | **35,891** | **lb/yr** | | **36,554** | **lb/yr** |
| | | **98.3** | **lbs/day** | | **100.1** | **lbs/day** |
| 2005 factor: | | 121.4 | lb/mgy | | | |
| **Full Secondary Emission Factor:** | | **0.3327** | lb/MG | | | |

Notes:

1 - Simple ratio of **full** plant flows for full secondary / partial secondary
2 - Result of direct field measurement
3 - Simple ratio of TWAS flows only secondary applied to solids processes
4 - Simple ratio of TOTAL sludge flows

| | |
|---|---|
| days per year | 365.25 |
| scaling | 23% |

**Program Operations**

# SJCWRP STATIONARY SOURCE CALCULATIONS

**Methodology**

Emission Factors for stationary sources from LACSD for 2008 and per SCAQMD rules in future years
Future year emission factors are assumed to be the same, except for NOx emission factors, which are lower to abide by SCAQMD BACT's
Existing emissions based on 2008 AER, divided by 365.25 days to get average daily emissions

**Scaling**

| | |
|---|---|
| 28803.3 | MG in 2008 |
| *365.25* | *days per year* |
| 78.86 | MGD Average in 2008 |
| 125 | MGD Capacity in 2050 |
| 59% | % increase based on 2050 capacity |

**Emission Factors**

| | | lbs/mmscf | | | | |
|---|---|---|---|---|---|---|
| | | VOCs | NOx | SO2 | CO | PM |
| 2008 | Central Plant Hot Water Heaters | 1.00 | 27.09 | 0.60 | 27.55 | 7.60 |
| 2050 | Central Plant Hot Water Heaters | 1.00 | 11.473 | 0.60 | 27.55 | 7.60 |

1) The two existing Natural Gas Boilers will be replaced with three smaller new boilers by 2013 to comply with up-coming NOx requirements of 9 ppm, boilers will meet BACT standards for all pollutants.
New NOx Emission Factor to Comply with 1146 would then be 11.473 lb NOx / mmcf natural g *-58%*

| **Emissions from the Annual Emissions Report for SJCWRP (from the 2008 AER)** | | | 2008 AER Emissions | | | | |
|---|---|---|---|---|---|---|---|
| | | | pounds per year | | | | |
| | **Device Description** | **Annual Usage** | **Organic Gases** | **NOx** | **SOx** | **CO** | **PM** |
| *B1 - Permiitted Annual Emissions from Fuel Combusiton in Boilers, Ovens, Furnaces, and Heaters* | Central Plant Hot Water Heaters | 15 | 15 | 397 | 9 | 403 | 111 |
| *B1U - Non-permitted Annual Emissions from Fuel Combustion in Boilers, Ovens, Furnaces, and Heaters* | Hot Water Heater | 1 | 4 | 74 | 0 | 62 | 6 |
| *B2 - Permitted Annual Emissions from Fuel Combustion - Internal Combustion Engines and Turbines* | Standby Stationary Emergency Generator | 4 | 163 | 2,040 | 1 | 444 | 146 |
| *B2U - Non-permitted Annual Emissions from Fuel Combustion - Internal Combustion* | Portable Diesel Powered Equipment | 0 | 5 | 56 | 0 | 12 | 4 |
| | Portable Gasoline Powered Equipment | 1 | 89 | 86 | 4 | 3,325 | 5 |
| *B3U - Non-Permitted Annual Emissions from the Use of Organics* | (Summed all sources of organics) | NA | 446 | 0 | 0 | 0 | 0 |
| *B4 - Permitted Annual Equipment Emissions from Miscellanseous Sources* | Sewage and wastewater treatment (east) | 18475 | 5,288 | 0 | 0 | 0 | 0 |
| | Sewage and wastewater treatment (west) | 10328 | 2,956 | 0 | 0 | 0 | 0 |
| | Gasoline Storage and Dispensing | 108 | 195 | 0 | 0 | 0 | 0 |
| *B4U - Non-permitted Annual Equipment Emissions from Miscellanseous Sources* | Laboratory Activities | 16000 | 419 | 0 | 0 | 0 | 0 |
| | | | **9,579** | **2,653** | **15** | **4,246** | **272** |

**Daily emission calcs**

| | Existing (pounds per day, average) | | | | | | | Project 2050 (pounds per day, PEAK) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Source** | **VOC** | **CO** | **NOx** | **SOx** | **PM10** | **PM2.5** | **scale?** | **VOC** | **CO** | **NOx** | **SOx** | **PM10** | **PM2.5** |
| Central Plant Hot Water Heaters | 0.04 | 1.10 | 1.09 | 0.02 | 0.303 | 0.3010 | No | 0.04 | 1.10 | 0.63 | 0.02 | 0.30 | 0.30 |
| Hot Water Heater | 0.01 | 0.17 | 0.20 | 0.00 | 0.015 | 0.0151 | No | 0.01 | 0.17 | 0.20 | 0.00 | 0.02 | 0.02 |
| Standby Stationary Emergency Generator | 0.45 | 1.21 | 5.59 | 0.00 | 0.383 | 0.3677 | No | 0.45 | 1.21 | 5.59 | 0.00 | 0.38 | 0.37 |
| Portable Diesel Powered Equipment | 0.01 | 0.03 | 0.15 | 0.00 | 0.011 | 0.0105 | No | 0.01 | 0.03 | 0.15 | 0.00 | 0.01 | 0.01 |
| Portable Gasoline Powered Equipment | 0.24 | 9.10 | 0.24 | 0.01 | 0.015 | 0.0149 | No | 0.24 | 9.10 | 0.24 | 0.01 | 0.01 | 0.01 |
| (Summed all sources of organics) | 1.22 | 0.00 | 0.00 | 0.00 | 0.000 | 0.0000 | No | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sewage and wastewater treatment (east) | 14.48 | 0.00 | 0.00 | 0.00 | 0.000 | 0.0000 | No | 14.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sewage and wastewater treatment (west) | 8.09 | 0.00 | 0.00 | 0.00 | 0.000 | 0.0000 | Yes | 12.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gasoline Storage and Dispensing | 0.53 | 0.00 | 0.00 | 0.00 | 0.000 | 0.0000 | No | 0.53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Laboratory Activities | 1.15 | 0.00 | 0.00 | 0.00 | 0.000 | 0.0000 | No | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| total | 26.2 | 11.6 | 7.3 | 0.0 | 0.7 | 0.7 | | 31.0 | 11.6 | 6.8 | 0.0 | 0.7 | 0.7 |

**Program Operations**

# SJCWRP EMERGENCY GENERATOR EMISSION CALCULATIONS

Assumes a Tier 4 2000 HP generator

Emsision standards from EPA420-P-03-002: http://www.epa.gov/oms/models/nonrdmdl/nonrdmdl2010/420r10018.pdf
ROG converted from HC using a 1.053 multiplier
CO2 and SO2 emission factors calculated using equations 6 and 7 on page 24 of EPA420-P-03-002

**Emission Standards**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | *1.053* | | | |
| | | | grams per hp-hr | | | | | | | | |
| | | | CO | NOX | PM10 | PM2.5 | ROG | SO2 | CO2 | HC | BSCF |
| Tier 4 Final | >1200 HP gen set | | 0.7642 | 0.46 | 0.069 | - | 0.2964195 | 0.048733651 | 530.1334357 | 0.2815 | 0.367 |

**Emission Calculations**

| *Equipment* | Number | Equipment Model Year | Annual Hours Use | Load Factor | Engine (hp) | Daily HP-HR | | ROG | CO | NOX | SO2 | PM10 | PM2.5 | N2O | CH4 | CO2 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Emission Factor (lb/hp-hr) | 6.53E-04 | 1.68E-03 | 1.01E-03 | 1.07E-04 | 1.52E-04 | 1.40E-04 | 2.97623E-05 | 6.63929E-05 | 1.17E+00 | -- |
| Generator | 1 | 2035 (Tier 4) | 50 | 0.74 | 2000 | 1480 | lbs/day (if run for 1 hr) | 1.0 | 2.5 | 1.5 | 0.2 | 0.2 | 0.2 | 0.0 | 0.1 | 1729.7 | -- |
| | | | | | | | MTs/yr (assuming 50 hours of testing per year) | | | | | | | 0.001 | 0.002 | 39 | 40 |

| Conversions | |
|---|---|
| grams per pound | 453.59237 |
| PM2.5 fraction of PM | 0.92 |
| lbs to MT | 0.000453592 |
| tons to MT | 0.90718474 |
| | |
| GWP | |
| CO2 | 1 |
| CH4 | 21 |
| N2O | 310 |

Emission Factors from Tier 4 Emission Standards
Emission Factor for N20 and CH4 based on ratio of N2O and CH4 to CO2 per gallon of diesel fuel in the GRP (CR 2011)

| | kg/gallon | g/gallon | ratio |
|---|---|---|---|
| CO2 | 10.21 | 10210 | |
| N2O | | 0.26 | 2.54652E-05 |
| Ch4 | | 0.58 | 5.68071E-05 |

SO2 Calculation for EF's — based on: http://www.epa.gov/oms/models/nonrdmdl/nonrdmdl2010/420r10018.pdf

g hp/hr or SO2 = (BSFC * 453.6 * (1-soxcnv)) - HC) * 0.01 * soxdsl * 2 *(equation 7, pg 24)*

Where:

| | | |
|---|---|---|
| BSFC = Brake Speci | 0.408 | *Table A4 for all HPs* |
| of fuel sulfur | 0.02247 | *Page C5* |
| HC = in-use adjuste | from above | |
| soxdsl = episodic | | |
| weight percent of | 0.015 | |
| | 453.59 | |
| | 0.01 | |
| | 2 | |

CO2 Calculation for EF's — based on: http://www.epa.gov/oms/models/nonrdmdl/nonrdmdl2010/420r10018.pdf

CO2 = (BSFC * 453.6 - HC) * 0.87 * (44/12) *(equation 6, pg 24)*

Where:

| | | |
|---|---|---|
| BSFC = Brake Specific Fuel | 0.408 | *Table A4 for all HPs* |
| HC = in-use adjusted hc er | from above | |
| carbon mass fraction of | | |
| diesel | 0.87 | |
| ratio of CO2 to carbon ma | 3.666666667 | |
| | 453.59 | |

**Program Operations**

# BIOSOLID HAULING EMISSION CALCULATIONS

## Biosolids Hauling Emissions

**Methodology**

Biosolids hauling assumes an additional 20 hauling trips by 205
Increase in truck hauling trips is scaled linearly assuming 20 additional trucks over the next 42 year perio
Exhaust emission factors from EMFAC2007 - BURDEN mode was used for regional hauling emissions and on-site idling calculations (lbs per mile and lbs per trip). EMFAC mode was used assuming 5mph travel for onsite emissions.

Road Dust from EPA AP-42 Section 13.2.1 (2006)

**Truck trips**

20 more daily truck trips over 42 years
0.48 more trucks per year

**Distances**

5 mph ONSITE - Heavy-duty trucks travel on site
0.59 ONSITE - Miles traveled on-site per truck
119.2 REGIONAL - one-way miles to landfills (existing)
164.8 REGIONAL - one-way miles to landfills (project

**VMT**

| Years to analyze | Truck Trips | REGIONAL Daily VMT (roundtrip) | ONSITE Daily VMT |
|---|---|---|---|
| 2008 | 55 | 13110 | 32 |
| 2020 | 61 | 20007 | 36 |
| 2030 | 65 | 21577 | 39 |
| 2040 | 70 | 23146 | 41 |
| 2050 | 75 | 24715 | 44 |

**Regional Emissions**

| | Criteria Pollutants | | | | | | Greenhouse Gases | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds Per Day | | | | | | Pounds per Day | | | | Metric Tons Per Year | | | |
| | ROG | CO | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | CO2 | N20 | CH4 | CO2e | CO2 | N20 | CH4 | CO2e |
| **2008 (baseline)** | | | | | | | | | | | | | | |
| Idling Emissions | 0.6 | 2.0 | 4.3 | 0.1 | 0.1 | 0.1 | 268.5 | 0.0 | 0.0 | 269 | 44 | 0.0001 | 0.0001 | 45 |
| VMT Emissions | 41.0 | 154.2 | 520.3 | 0.5 | 27.0 | 23.9 | 53,118.2 | 0.1 | 0.1 | 53,164 | 8,800 | 0.0230 | 0.0244 | 8,808 |
| Road Dust | -- | -- | -- | -- | 284.8 | 42.7 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **41.6** | **156.3** | **524.6** | **0.6** | **311.8** | **66.7** | **53,386.6** | **0.1** | **0.1** | **53,433.0** | **8,844.8** | **0.0231** | **0.0245** | **8,852.5** |
| **2020** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 1.9 | 5.4 | 0.1 | 0.0 | 0.0 | 296.4 | 0.0 | 0.0 | 297 | 49 | 0.0001 | 0.0001 | 49 |
| VMT Emissions | 18.1 | 83.5 | 196.7 | 0.8 | 12.4 | 9.8 | 81,274.1 | 0.2 | 0.2 | 81,344 | 13,465 | 0.0351 | 0.0373 | 13,477 |
| Road Dust | -- | -- | -- | -- | 434.6 | 65.2 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **18.5** | **85.4** | **202.1** | **0.9** | **447.1** | **75.0** | **81,570.5** | **0.2** | **0.2** | **81,641.1** | **13,514.2** | **0.0352** | **0.0374** | **13,525.9** |
| **2030** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 2.3 | 6.8 | 0.1 | 0.0 | 0.0 | 365.9 | 0.0 | 0.0 | 366 | 61 | 0.0002 | 0.0002 | 61 |
| VMT Emissions | 11.7 | 61.7 | 121.2 | 0.9 | 8.9 | 6.4 | 87,526.7 | 0.2 | 0.2 | 87,603 | 14,501 | 0.0378 | 0.0402 | 14,514 |
| Road Dust | -- | -- | -- | -- | 468.7 | 70.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **12.1** | **64.0** | **128.0** | **1.0** | **477.6** | **76.7** | **87,892.6** | **0.2** | **0.2** | **87,968.8** | **14,561.6** | **0.0380** | **0.0404** | **14,574.2** |
| **2040** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 2.1 | 6.4 | 0.1 | 0.0 | 0.0 | 342.7 | 0.0 | 0.0 | 343 | 57 | 0.0001 | 0.0002 | 57 |
| VMT Emissions | 11.9 | 62.0 | 120.5 | 0.9 | 8.9 | 6.2 | 94,216.7 | 0.2 | 0.3 | 94,298 | 15,609 | 0.0406 | 0.0431 | 15,623 |
| Road Dust | -- | -- | -- | -- | 502.8 | 75.4 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **12.3** | **64.1** | **126.9** | **1.0** | **511.7** | **81.6** | **94,559.4** | **0.2** | **0.3** | **94,641.1** | **15,666.1** | **0.0407** | **0.0433** | **15,679.6** |
| **2050** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 2.3 | 6.8 | 0.1 | 0.0 | 0.0 | 365.9 | 0.0 | 0.0 | 366 | 61 | 0.0002 | 0.0002 | 61 |
| VMT Emissions | 12.7 | 66.2 | 128.7 | 1.0 | 9.5 | 6.6 | 100,604.3 | 0.3 | 0.3 | 100,691 | 16,668 | 0.0433 | 0.0460 | 16,682 |
| Road Dust | -- | -- | -- | -- | 536.9 | 80.5 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **13.1** | **68.5** | **135.5** | **1.1** | **546.3** | **87.2** | **100,970.2** | **0.3** | **0.3** | **101,057.4** | **16,728.2** | **0.0435** | **0.0462** | **16,742.7** |
| **Max Daily with Program** | **18.5** | **85.4** | **202.1** | **1.1** | **546.3** | **87.2** | **100,970.2** | **0.3** | **0.3** | **101,057.4** | **16,728.2** | **0.0** | **0.0** | **16,742.7** |

**On-site Emissions**

| | Pounds Per Day | | | | | | Pounds per Day | | | | Metric Tons Per Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | CO2 | N20 | CH4 | CO2e | CO2 | N20 | CH4 | CO2e |
| **2008 (baseline)** | | | | | | | | | | | | | | |
| VMT Emissions | 0.97 | 2.12 | 3.20 | 0.00 | 0.23 | 0.21 | 271.10 | 0.00 | 0.00 | 271 | 45 | 0.0001 | 0.0001 | 45 |
| Road Dust | -- | -- | -- | -- | 0.70 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.97** | **2.12** | **3.20** | **0.00** | **0.93** | **0.31** | **271.10** | **0.00** | **0.00** | **271.22** | **44.91** | **0.00** | **0.00** | **44.93** |
| **2020** | | | | | | | | | | | | | | |
| VMT Emissions | 0.33 | 0.76 | 0.99 | 0.00 | 0.04 | 0.03 | 302.15 | 0.00 | 0.00 | 302 | 50 | 0.0001 | 0.0001 | 50 |
| Road Dust | -- | -- | -- | -- | 0.78 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.33** | **0.76** | **0.99** | **0.00** | **0.82** | **0.15** | **302.15** | **0.00** | **0.00** | **302.28** | **50.06** | **0.00** | **0.00** | **50.08** |
| **2030** | | | | | | | | | | | | | | |
| VMT Emissions | 0.22 | 0.53 | 0.64 | 0.00 | 0.01 | 0.01 | 326.28 | 0.00 | 0.00 | 326 | 54 | 0.0001 | 0.0001 | 54 |
| Road Dust | -- | -- | -- | -- | 0.84 | 0.13 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.22** | **0.53** | **0.64** | **0.00** | **0.85** | **0.14** | **326.28** | **0.00** | **0.00** | **326.42** | **54.06** | **0.00** | **0.00** | **54.08** |
| **2040** | | | | | | | | | | | | | | |
| VMT Emissions | 0.22 | 0.54 | 0.63 | 0.00 | 0.01 | 0.01 | 350.07 | 0.00 | 0.00 | 350 | 58 | 0.0001 | 0.0001 | 58 |
| Road Dust | -- | -- | -- | -- | 0.90 | 0.14 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.22** | **0.54** | **0.63** | **0.00** | **0.91** | **0.14** | **350.07** | **0.00** | **0.00** | **350.21** | **58.00** | **0.00** | **0.00** | **58.02** |
| **2050** | | | | | | | | | | | | | | |
| VMT Emissions | 0.23 | 0.57 | 0.68 | 0.00 | 0.02 | 0.01 | 373.80 | 0.00 | 0.00 | 374 | 62 | 0.0001 | 0.0001 | 62 |
| Road Dust | -- | -- | -- | -- | 0.96 | 0.14 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.23** | **0.57** | **0.68** | **0.00** | **0.98** | **0.15** | **373.80** | **0.00** | **0.00** | **373.96** | **61.93** | **0.00** | **0.00** | **61.96** |

**Program Operations**

# BIOSOLIDS HAULING - SUMMARY PER BASIN

Total Emissions

| | TOTAL Emissions | | | | | |
|---|---|---|---|---|---|---|
| | **ROG** | **CO** | **NOx** | **$SO_X$** | **$PM_{10}$** | **$PM_{2.5}$** |
| CEQA Baseline | 43 | 158 | 528 | 1 | 313 | 67 |
| 2020 | 19 | 86 | 203 | 1 | 448 | 75 |
| 2030 | 12 | 65 | 129 | 1 | 478 | 77 |
| 2040 | 12 | 65 | 128 | 1 | 513 | 82 |
| 2050 | 13 | 69 | 136 | 1 | 547 | 87 |
| max | 19 | 86 | 203 | 1 | 547 | 87 |
| | -24 | -72 | -325 | 1 | 235 | 20 |

| | |
|---|---|
| days per year | 365.25 |
| lbs to ton conversion | 0.0005 |

% VMT per Basin

| | % of miles in each air basin | | | |
|---|---|---|---|---|
| | SCAB | SDAB | SJVAB | SSAB |
| Baseline | 58.51% | 11.88% | 19.47% | 9.13% |
| Project | 55.06% | 10.18% | 26.08% | 7.82% |

*(see "distance to landfill" sheet)*

Results

Pounds per Day

| | **SCAB** | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOx | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Project | 10 | 47 | 112 | 1 | 301 | 48 |
| **CEQA Baseline** | **25** | **93** | **309** | **0** | **183** | **39** |
| Increment | -15 | -45 | -197 | 0 | 118 | 9 |
| regional thresholds | 55 | 550 | 55 | 150 | 150 | 55 |
| Significant? | No | No | No | No | No | No |

| | **SDAB** | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOx | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Project | 2 | 9 | 21 | 0 | 56 | 9 |
| **CEQA Baseline** | **5** | **19** | **63** | **0** | **37** | **8** |
| Increment | -3 | -10 | -42 | 0 | 19 | 1 |
| regional thresholds | 75 | 550 | 250 | 250 | 100 | 55 |
| Significant? | No | No | No | No | No | No |

| | **SSAB** | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOx | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Project | 1 | 7 | 16 | 0 | 43 | 7 |
| **CEQA Baseline** | **4** | **14** | **48** | **0** | **29** | **6** |
| Increment | -2 | -8 | -32 | 0 | 14 | 1 |
| regional thresholds | 55 | 550 | 55 | 150 | 150 | 55 |
| Significant? | No | No | No | No | No | No |

| | **SJVAB** | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOx | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Project | 5 | 22 | 53 | 0 | 143 | 23 |
| **CEQA Baseline** | **8** | **31** | **103** | **0** | **61** | **13** |
| Increment | -3 | -8 | -50 | 0 | 82 | 10 |
| regional thresholds | 55 | 55 | - | - | - | - |
| Significant? | No | No | No | No | No | No |

in tons per year

| | **SJVAB** | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOx | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Project | 1 | 4 | 10 | 0 | 26 | 4 |
| **CEQA Baseline** | **2** | **6** | **19** | **0** | **11** | **2** |
| Increment | -1 | -2 | -9 | 0 | 15 | 2 |
| regional thresholds | 10 | 10 | | | | |
| Significant? | No | No | No | No | No | No |

# DISTANCE TO BIOSOLID MANAGEMENT LOCATIONS

**Methodology**

Calculated a weighted mean to the biosolid management locations using the following equation

**Assumptions**

25 ton haul truck capacity
365.25 days per year

| Future Biosolids Management Locations (Chapter 3) | | | | | Quantity (wtpy) | | Quantity (wtpd) | | | truck trips per day | | | using low | | using high | | using avg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facility | Management Practice | Status | Location | Distance From JWPCP (miles) | low | high | Low | High | avg | low | high | avg | % of trips | | % of trips | | % of trips | | |
| Westlake Farms | Composting | Expected in 2012 | Kings County, CA | 200 | 300,000 | 500,000 | 821.36 | 1,368.93 | 1,095.14 | 33 | 55 | 44 | 67% | 133 | 33% | 67 | 41% | 82 | |
| EnerTech | Renewable Fuel | Operating | Rialto, CA | 75 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 11% | 8 | 10% | 8 | 10% | 8 | |
| South Kern Industrial Center | Composting | Operating | Kern County, CA | 131 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 11% | 15 | 10% | 13 | 10% | 13 | |
| Inland Empire Regional Composting Facility | Composting | Operating | Rancho Cucamonga, CA | 59 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 11% | 7 | 10% | 6 | 10% | 6 | |
| San Joaquin Composting Facility | Composting | Operating | Kern County, CA | 170 | 0 | 150,000 | 0.00 | 410.68 | 205.34 | 0 | 16 | 8 | 0% | 0 | 10% | 17 | 8% | 13 | |
| Desert Ridge Farms | Land Application | Operating | Yuma County, AZ | 300 | 0 | 150,000 | 0.00 | 410.68 | 205.34 | 0 | 16 | 8 | 0% | 0 | 10% | 30 | 8% | 23 | |
| Honey Bucket Farms | Land Application w/ Lime Stabilization | Operating | Kern County, CA | 160 | 0 | 150,000 | 0.00 | 410.68 | 205.34 | 0 | 16 | 8 | 0% | 0 | 10% | 16 | 8% | 12 | |
| Mitsubishi Cement Corp | Injection for $NO_x$ Control | Operating | San Bernardino County, CA | 129 | 0 | 100,000 | 0.00 | 273.79 | 136.89 | 0 | 11 | 5 | 0% | 0 | 7% | 9 | 5% | 7 | |
| | | | total | | 450,000 | 1,500,000 | 1,232 | 4,107 | 2,669 | 49 | 164 | 107 | | **163** | | **165** | | **164** | **Miles (Weighted Mean)** |

| Existing Biosolids Management Practices (Chapter 2) | | | | | Quantity (wtpy) | | Quantity (wtpd) | | | truck trips per day | | | using low | | using high | | using avg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facility | Management Practice | Status | Location | Distance From JWPCP (miles) | low | high | low | high | avg | low | high | avg | % of trips | | % of trips | | % of trips | | |
| San Joaquin Composting Facility | Composting | Operating | Kern County, CA | 170 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 18% | 30 | 20% | 34 | 20% | 33 | |
| South Kern Industrial Center | Composting | Operating | Kern County, CA | 131 | 50,000 | 75,000 | 136.89 | 205.34 | 171.12 | 5 | 8 | 7 | 18% | 23 | 10% | 13 | 12% | 16 | |
| Inland Empire Regional Composting Facility | Composting | Operating | Rancho Cucamonga, CA | 59 | 50,000 | 75,000 | 136.89 | 205.34 | 171.12 | 5 | 8 | 7 | 18% | 11 | 10% | 6 | 12% | 7 | |
| Honey Bucket Farms | Land Application w/ Lime Stabilization | Operating | Kern County, CA | 160 | 25,000 | 75,000 | 68.45 | 205.34 | 136.89 | 3 | 8 | 5 | 9% | 14 | 10% | 16 | 10% | 16 | |
| Desert Ridge Farms | Land Application | Operating | Yuma County, AZ | 300 | 25,000 | 75,000 | 68.45 | 205.34 | 136.89 | 3 | 8 | 5 | 9% | 27 | 10% | 30 | 10% | 29 | |
| EnerTech | Renewable Fuel | Operating | Rialto, CA | 75 | 25,000 | 75,000 | 68.45 | 205.34 | 136.89 | 3 | 8 | 5 | 9% | 7 | 10% | 8 | 10% | 7 | |
| Mitsubishi Cement Corp | Injection for $NO_x$ Control | Operating | San Bernardino County, CA | 129 | 5,000 | 15,000 | 13.69 | 41.07 | 27.38 | 1 | 2 | 1 | 2% | 2 | 2% | 3 | 2% | 3 | |
| Puente Hills Landfill | Landfill Co-disposal | Operating | Los Angeles County, CA | 27 | 50,000 | 200,000 | 136.89 | 547.57 | 342.23 | 5 | 22 | 14 | 18% | 5 | 27% | 7 | 25% | 7 | |
| | | | total | | 280,000 | 740,000 | 767 | 2,026 | 1,396 | 31 | 81 | 56 | | **119** | | **118** | | **118** | **Miles (Weighted Mean)** |

## Biosolid Hauling - VMT in each basin

**Methodology**

used Google Earth to map the distance traveled from JWPCP to the various landfills within each basin

output GIS shapefiles into kml file for use

**Assumed Distances**

| | |
|---|---|
| scab north | 86.5 miles |
| scab south | 56.1 miles |
| sdab to ssab | 123 miles |
| ssab to AZ | 94.5 miles |

| | | | Miles Per Basin per trip | | | |
|---|---|---|---|---|---|---|
| | | | Future | | | |
| Future Facility | Basin of Facility | Distance From JWPCP (miles) | SCAB | SJV | SDAB | SSAB |
| Westlake Farms | SJV | 200 | 86.5 | 113.5 | -- | -- |
| EnerTech | SCAB | 75 | 75 | -- | -- | -- |
| South Kern Industrial Center | SJV | 131 | 86.5 | 44.5 | -- | -- |
| Inland Empire Regional Composting Facility | SCAB | 59 | 59 | -- | -- | -- |
| San Joaquin Composting Facility | SJV | 170 | 86.5 | 83.5 | -- | -- |
| Desert Ridge Farms | AZ | 300 | 56.1 | -- | 123 | 94.5 |
| Honey Bucket Farms | SJV | 160 | 86.5 | 73.5 | -- | -- |
| Mitsubishi Cement Corp | SCAB | 129 | 129 | -- | -- | -- |
| | | 1208 | 665.1 | 315 | 123 | 94.5 |
| | | > weighted distances in each basin | 55.06% | 26.08% | 10.18% | 7.82% |

| | | | Existing | | | |
|---|---|---|---|---|---|---|
| Existing Facility | Basin of Facility | Distance From JWPCP (miles) | SCAB | SJV | SDAB | SSAB |
| San Joaquin Composting Facility | SJV | 170 | 86.5 | 83.5 | -- | -- |
| South Kern Industrial Center | SJV | 131 | 86.5 | 44.5 | -- | -- |
| Inland Empire Regional Composting Facility | SCAB | 59 | 59 | -- | -- | -- |
| Honey Bucket Farms | SJV | 160 | 86.5 | 73.5 | -- | -- |
| Desert Ridge Farms | AZ | 300 | 56.1 | | 123 | 94.5 |
| EnerTech | SCAB | 75 | 75 | -- | -- | -- |
| Mitsubishi Cement Corp | SCAB | 129 | 129 | -- | -- | -- |
| Puente Hills Landfill | SCAB | 27 | 27 | -- | -- | -- |
| | | 1035 | 605.6 | 201.5 | 123 | 94.5 |
| | | > weighted distances in each basin | 58.51% | 19.47% | 11.88% | 9.13% |

**Program Operations**

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS
# ONSITE TRAVEL (5mph)

**EMFAC 2007 on-site hauling emission factor - 2008**

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 6/10/2010 10:30:42
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2008 -- Model Years 1965 to 2008 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 13.564 | 0 | 0 | 13.564 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 29.699 | 0 | 0 | 29.699 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 44.8 | 0 | 0 | 44.8 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3789.508 | 0 | 0 | 3789.508 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.127 | 0 | 0 | 3.127 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.035 | 0 | 0 | 0.035 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.088 | 0 | 0 | 3.088 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

**Program Operations**

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS
# ONSITE TRAVEL (5mph)

**EMFAC 2007 on-site hauling emission factor - 2020**

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default
Version : Emfac2007 V2.3 Nov 1 2006 Title
Run Date : 6/10/2010 10:30:42
Scen Year: 2020 -- All model years in the range 1976 to 2020
Season : Annual selected
Area : South Coast AQMD

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Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 4.219 | 0 | 0 | 4.219 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 9.641 | 0 | 0 | 9.641 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 12.504 | 0 | 0 | 12.504 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3826.031 | 0 | 0 | 3826.031 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.037 | 0 | 0 | 0.037 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.424 | 0 | 0 | 0.424 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.182 | 0 | 0 | 3.182 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

**Program Operations**

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS
# ONSITE TRAVEL (5mph)

**EMFAC 2007 on-site hauling emission factor - 2030**

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 6/10/2010 10:30:42
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : South Coast AQMD

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Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.553 | 0 | 0 | 2.553 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 6.275 | 0 | 0 | 6.275 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 7.488 | 0 | 0 | 7.488 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3831.069 | 0 | 0 | 3831.069 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.037 | 0 | 0 | 0.037 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.111 | 0 | 0 | 0.111 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.254 | 0 | 0 | 3.254 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

**Program Operations**

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS
# ONSITE TRAVEL (5mph)

**EMFAC 2007 on-site hauling emission factor - 2040**

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 6/10/2010 10:30:42
Scen Year: 2040 -- All model years in the range 1996 to 2040 selected
Season : Annual
Area : South Coast AQMD

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Year: 2040 -- Model Years 1996 to 2040 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.371 | 0 | 0 | 2.371 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 5.859 | 0 | 0 | 5.859 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 6.931 | 0 | 0 | 6.931 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3831.709 | 0 | 0 | 3831.709 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.037 | 0 | 0 | 0.037 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.09 | 0 | 0 | 0.09 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.269 | 0 | 0 | 3.269 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

**Program Operations**

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS
# REGIONAL TRAVEL

**EMFAC 2007 regional hauling emission factors - 2008**
Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 49391 | | | | |
| VMT/1000 | 9028 | 9028000 | | | |
| Trips | 249946 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 14.12 | | 28240 | 0.003128046 | |
| Idle Exh | 1.27 | | 2540 | | 0.010162195 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 15.39 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 15.39 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 53.11 | | 106220 | 0.011765618 | |
| Idle Exh | 4.6 | | 9200 | | 0.036807951 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 57.71 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 179.14 | | 358280 | 0.039685423 | |
| Idle Exh | 9.79 | | 19580 | | 0.078336921 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 188.93 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 18.29 | | 36580000 | 4.051838724 | |
| Idle Exh | 0.61 | | 1220000 | | 4.881054308 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 18.9 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 8.73 | | 17460 | 0.001933983 | |
| Idle Exh | 0.2 | | 400 | | 0.001600346 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 8.93 | | | | |
| | | | | | |
| TireWear | 0.36 | | 720 | 7.97519E-05 | |
| BrakeWr | 0.28 | | 560 | 6.20292E-05 | |
| | ------- | | | | |
| Total | 9.57 | | | | |
| Lead | 0 | | | | |
| SOx | 0.18 | | 360 | 3.98759E-05 | 0.001440311 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 1700.79 | | | | |

**EMFAC 2007 regional hauling emission factors - 2020**
Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 65570 | | | | |
| VMT/1000 | 13761 | 13761000 | | | |
| Trips | 331816 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.23 | | 12460 | 0.000905457 | |
| Idle Exh | 1.04 | | 2080 | | 0.006268534 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 7.28 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 7.28 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 28.7 | | 57400 | 0.004171208 | |
| Idle Exh | 5.21 | | 10420 | | 0.031402946 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 33.92 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 67.65 | | 135300 | 0.009832134 | |
| Idle Exh | 14.76 | | 29520 | | 0.088964969 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 82.41 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 27.95 | | 55900000 | 4.062204782 | |
| Idle Exh | 0.81 | | 1620000 | | 4.882223883 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 28.76 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.3 | | 6600 | 0.000479616 | |
| Idle Exh | 0.06 | | 120 | | 0.000361646 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 3.36 | | | | |
| | | | | | |
| TireWear | 0.55 | | 1100 | 7.99361E-05 | |
| BrakeWr | 0.43 | | 860 | 6.24955E-05 | |
| | ------- | | | | |
| Total | 4.33 | | | | |
| Lead | 0 | | | | |
| SOx | 0.27 | | 540 | 3.92413E-05 | 0.001627408 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2588.03 | | | | |

**Program Operations**

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS
# REGIONAL TRAVEL

**EMFAC 2007 regional hauling emission factors - 2030**
Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 82364 | | | | |
| VMT/1000 | 17044 | 17044000 | | | |
| Trips | 416803 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 4.62 | | 9240 | 0.000542126 | |
| Idle Exh | 1.19 | | 2380 | | 0.005710132 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 5.81 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | --- | | | | |
| Total | 5.81 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 24.37 | | 48740 | 0.002859657 | |
| Idle Exh | 6.37 | | 12740 | | 0.030565999 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 30.75 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 47.87 | | 95740 | 0.005617226 | |
| Idle Exh | 18.87 | | 37740 | | 0.090546373 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 66.74 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 34.57 | | 69140000 | 4.056559493 | |
| Idle Exh | 1.01 | | 2020000 | | 4.846414253 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 35.58 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.3 | | 4600 | 0.00026989 | |
| Idle Exh | 0.03 | | 60 | | 0.000143953 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 2.32 | | | | |
| | | | | | |
| TireWear | 0.68 | | 1360 | 7.97935E-05 | |
| BrakeWr | 0.53 | | 1060 | 6.2192E-05 | |
| | --- | | | | |
| Total | 3.53 | | | | |
| Lead | 0 | | | | |
| SOx | 0.34 | | 680 | 3.98967E-05 | 0.001631466 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 3202.33 | | | | |

**EMFAC 2007 regional hauling emission factors - 2040**
Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2040 -- All model years in the range 1996 to 2040 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 104492 | | | | |
| VMT/1000 | 21594 | 21594000 | | | |
| Trips | 528782 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.54 | | 11080 | 0.000513105 | |
| Idle Exh | 1.49 | | 2980 | | 0.005635593 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 7.03 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | --- | | | | |
| Total | 7.03 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 28.92 | | 57840 | 0.002678522 | |
| Idle Exh | 8.05 | | 16100 | | 0.03044733 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 36.98 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 56.22 | | 112440 | 0.005207002 | |
| Idle Exh | 24 | | 48000 | | 0.090774648 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 80.22 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 43.95 | | 87900000 | 4.07057516 | |
| Idle Exh | 1.29 | | 2580000 | | 4.879137338 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 45.23 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.61 | | 5220 | 0.000241734 | |
| Idle Exh | 0.02 | | 40 | | 7.56455E-05 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 2.64 | | | | |
| | | | | | |
| TireWear | 0.86 | | 1720 | 7.96518E-05 | |
| BrakeWr | 0.67 | | 1340 | 6.20543E-05 | |
| | --- | | | | |
| Total | 4.17 | | | | |
| Lead | 0 | | | | |
| SOx | 0.43 | | 860 | 3.98259E-05 | 0.001626379 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 4070.99 | | | | |

**Program Operations**

# SUMMARY OF EMISSION FACTORS FOR BIOSOLID HAULING TRUCKS

from EMFAC BURDEN mode, for regional hauling and idling

| | Criteria Pollutants | | | | | | GHGs | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 | N20 | CH4 |
| **Pounds per mile** | | | | | | | | | |
| 2008 | 0.0031 | 0.0118 | 0.0397 | 0.0000 | 0.0021 | 0.0018 | 4.0518 | 0.000011 | 0.000011 |
| 2020 | 0.0009 | 0.0042 | 0.0098 | 0.0000 | 0.0006 | 0.0005 | 4.0622 | 0.000011 | 0.000011 |
| 2030 | 0.0005 | 0.0029 | 0.0056 | 0.0000 | 0.0004 | 0.0003 | 4.0566 | 0.000011 | 0.000011 |
| 2040 | 0.0005 | 0.0027 | 0.0052 | 0.0000 | 0.0004 | 0.0003 | 4.0706 | 0.000011 | 0.000011 |
| 2050 | 0.0005 | 0.0027 | 0.0052 | 0.0000 | 0.0004 | 0.0003 | 4.0706 | 0.000011 | 0.000011 |
| **Pounds per idle trip** | | | | | | | | | |
| 2008 | 0.0102 | 0.0368 | 0.0783 | 0.0014 | 0.0016 | 0.0015 | 4.8811 | 0.000013 | 0.000014 |
| 2020 | 0.0063 | 0.0314 | 0.0890 | 0.0016 | 0.0004 | 0.0003 | 4.8822 | 0.000013 | 0.000014 |
| 2030 | 0.0057 | 0.0306 | 0.0905 | 0.0016 | 0.0001 | 0.0001 | 4.8464 | 0.000013 | 0.000013 |
| 2040 | 0.0056 | 0.0304 | 0.0908 | 0.0016 | 0.0001 | 0.0001 | 4.8791 | 0.000013 | 0.000014 |
| 2050 | 0.0056 | 0.0304 | 0.0908 | 0.0016 | 0.0001 | 0.0001 | 4.8791 | 0.000013 | 0.000014 |

from EMFAC, 5mph, for onsite travel

| | Criteria Pollutants | | | | | | GHGs | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 | N20 | CH4 |
| **Pounds per mile** | | | | | | | | | |
| 2008 | 0.0299 | 0.0655 | 0.0988 | 0.0001 | 0.0070 | 0.0064 | 8.3544 | 0.000011 | 0.000011 |
| 2020 | 0.0093 | 0.0213 | 0.0276 | 0.0001 | 0.0011 | 0.0009 | 8.4350 | 0.000011 | 0.000011 |
| 2030 | 0.0056 | 0.0138 | 0.0165 | 0.0001 | 0.0004 | 0.0003 | 8.4461 | 0.000011 | 0.000011 |
| 2040 | 0.0052 | 0.0129 | 0.0153 | 0.0001 | 0.0003 | 0.0002 | 8.4475 | 0.000011 | 0.000011 |
| 2050 | 0.0052 | 0.0129 | 0.0153 | 0.0001 | 0.0003 | 0.0002 | 8.4475 | 0.000011 | 0.000011 |

N2O and CH4 emission factors from General Reporting Protocol, Version 3.1. (Jan 2009)

| | grams/mi | lbs/mile | GHG ratio to CO2 for idling calcs |
|---|---|---|---|
| CH4 | 0.0051 | 1.12436E-05 | 2.77495E-06 |
| N2O | 0.0048 | 1.05822E-05 | 2.61171E-06 |

(Table C.4)

*grams per pound* *453.59*

Road Dust (EPA AP-42, Section 13.2.1 Paved Roads, November 2006)

| | PM10 | PM2.5 |
|---|---|---|
| pounds per mile | 0.021722332 | 0.00325835 |

**Program Operations**

# ON-ROAD DUST MITIGATION METHODOLOGY AND EMISISON FACTOR

**Methodology**

EPA AP-42, Section 13.2.1, Paved Road (November 2006) http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201_2006.pdf

For the daily basis, Equation 1 becomes:

$$E_{ext} = \left[k\left(\frac{sL}{2}\right)^{0.65}\left(\frac{W}{3}\right)^{1.5} - C\right]\left(1 - \frac{P}{4N}\right) \quad (2)$$

where $k$, $sL$, $W$, and $C$ are as defined in Equation 1 and

$E_{ext}$ = annual or other long-term average emission factor in the same units as $k$,
$P$ = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and
$N$ = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

**Calculation**

| Pollutant | Variables | | | | | Emission Factor (lbs/VMT) |
|---|---|---|---|---|---|---|
| | k | sL | W | P | N | E |
| $PM_{10}$ | 0.016 | 0.02 | 27.5 | 35 | 365.25 | 0.0217223 |
| $PM_{2.5}$ | 0.0024 | 0.02 | 27.5 | 35 | 365.25 | 0.0032583 |

E = particulate emission factor (lbs of particulate matter/VMT)

k = particle size multiplier (lb/VMT) — 0.016 for PM10, 0.0024 for PM2.5

sL = roadway silt loading (g/m2) — 0.02 (freeway, SC portion of LA County)

W = average weight of vehicles on the road (tons) — 27.5 average weight of hauling trucks (tons) - assuming 15 ton trucks, 1/2 of trips are full (15+25 tons) and 1/2 are empty (15 tons)

P = number of wet days with at least 0.254mm of precipitation — 35 LA County http://lwf.ncdc.noaa.gov/oa/climate/online/ccd/prcpdays.html; 37 Bakersfield http://lwf.ncdc.noaa.gov/oa/climate/online/ccd/prcpdays.html

N = number of days in the averaging period — 365.25

# Project Construction Calculations

## Alternative 1

# PROJECT AND PROGRAM CONSTRUCTION OVERLAP

## Project and Program Schedule

**PROJECT**

| Phase | Start Date | Duration (Months) |
|---|---|---|
| 1. TBM Mobilization | 1/1/2015 | 15 |
| 2. JWPCP East Shaft Site Construction | 1/1/2015 | 12 |
| 3. Assemble TBM | 4/1/2016 | 3 |
| 4. Onshore Tunnel | 7/1/2016 | 24 |
| 5. JWPCP Headworks Construction | 1/1/2015 | 48 |
| 6. LGRT Shaft Site Construction | 1/1/2015 | 15 |
| 7. Assemble TBM | 4/1/2016 | 3 |
| 8. Offshore Tunnel | 7/1/2016 | 78 |
| 9. SW Marine Shaft Site Construction | 7/1/2015 | 12 |
| 10. Assemble TBM | 10/1/2020 | 3 |
| 11. SP Diffuser Construction | 10/1/2021 | 12 |
| 12 Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 |
| Timeslice | | |

**PROGRAM**

| | Possible Start Date | Possible End Date |
|---|---|---|
| JWPCP Solids Processing | 1/1/2018 | 1/1/2050 |
| SJCWRP – Process Optimization | 1/1/2018 | 11/31/2019 |
| POWRP – Process Optimization | 1/1/2018 | 11/31/2019 |
| HTP – Process Optimization | 1/1/2018 | 11/31/2019 |
| LBWRP – Process Optimization | 1/1/2018 | 11/31/2019 |
| SJCWRP Plant Expansion | 1/1/2035 | 11/31/2040 |

OVERLAPPING PHASES →

NO PROGRAM CONSTRUCTION

WRP and JWPCP overlap with onshore and offshore tunneling

WRP and JWPCP overlap with offshore tunneling

WRP and JWPCP overlap with offshore tunneling and SP Riser construction

JWPCP Solids Processing overlap with offshore tunneling and SP Riser construction

JWPCP Solids Processing overlap with offshore tunneling, SP Diffuser Construction, and Existing Ocean Outfall Rehabilitation

JWPCP Solids Processing overlap with offshore tunneling and SP Diffuser Construction

JWPCP Solids Processing overlap with offshore tunneling

Joint SJCWRP Plant Expansion

**Project Construction**

## ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

**Phase 1 — TBM Mobilization**, Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.6 | 3.8 | 4.3 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.5 | 1.8 | 4.0 | 0.0 | 0.2 | 0.1 | 549.6 | 0.0 | 0.0 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.5 | 3.3 | 4.0 | 0.0 | 0.2 | 0.2 | 568.3 | 0.0 | 0.0 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.4 | 1.2 | 2.8 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.4 | 1.2 | 3.2 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 0 | 6 | 0.00 | g/hp-hr | 0.4 | 1.4 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.4 | 1.3 | 3.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.6 | 3.8 | 4.2 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.4 | 1.3 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.2 | 1.0 | 1.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.5 | 1.4 | 5.3 | 0.0 | 0.2 | 0.1 | 568.3 | 0.0 | 0.0 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.4 | 1.3 | 3.5 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.3 | 2.6 | 4.7 | 0.0 | 0.1 | 0.1 | 35.0 | 0.0 | 0.0 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.3 | 1.2 | 3.3 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| | | Daily Trips | Idle Time | | Tons Soil | | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | 0 | 5 | | | | | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | | 0.00 | | | | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |
| | | | Miles / | Daily Trips | | Miles / Day | Acres Disturbed | | | | | | | | | | | |
| On-Road Truck | onroad | | 60 | 0 | | 0 | | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | | 0 | | | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | | 20 | 0 | | 0 | | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | | 0 | | | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unmitigated Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**Phase 2 — JWPCP East**, Start Date 2015

| Equipment | Type | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 2 | 6 | 3840.00 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 1 | 8 | 957.60 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |
| | | Daily Trips | Idle Time | | Tons Soil | | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | 130 | 5 | | | | | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | | 3250.00 | | | | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |
| | | | Miles / | Daily Trips | | Miles / Day | Acres Disturbed | | | | | | | | | | | |
| On-Road Truck | onroad | | 60 | 130 | | 7800 | | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | | 130 | | | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | | 20 | 20 | | 400 | | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | | 20 | | | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.8 | 14.9 | 5.1 | 0.0 | 0.7 | 0.6 | 4652.6 | 0.1 | 0.0 | 4654.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.5 | 9.4 | 3.3 | 0.0 | 0.4 | 0.4 | 4439.1 | 0.0 | 0.0 | 4440.1 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.2 | 2.6 | 1.0 | 0.0 | 0.1 | 0.1 | 1199.7 | 0.0 | 0.0 | 1200.0 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.4 | 6.9 | 2.5 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.1 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.2 | 2.8 | 1.2 | 0.0 | 0.2 | 0.1 | 1187.6 | 0.0 | 0.0 | 1188.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.1 | 2.4 | 1.0 | 0.0 | 0.1 | 0.1 | 1079.8 | 0.0 | 0.0 | 1080.1 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.4** | **40.1** | **17.0** | **0.2** | **2.4** | **1.8** | **15550.2** | **0.2** | **0.0** | **15554.2** |
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

**Project Construction**

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

**Phase 3 — Assemble TBM — Start Date 2016**

| Equipment | Type | Equipment Specs | | | | | | | E.F. Units | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 0 | 6 | 0.00 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Item | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 0 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | On Site Total | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Item | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Phase 4 — Onshore Tunnel — Start Date 2016**

| Equipment | Type | Equipment Specs | | | | | | | E.F. Units | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 1 | 24 | 384.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 1 | 12 | 4800.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 2 | 6 | 1044.00 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 1 | 24 | 1344.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 1 | 24 | 3360.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 1 | 8 | 640.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 1 | 12 | 720.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 1 | 6 | 360.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 1 | 24 | 192.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 1 | 12 | 59520.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 1 | 12 | 28800.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 1 | 19 | 60800.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 1 | 12 | 734.40 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 1 | 12 | 26880.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 1 | 24 | 71040.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 1 | 3 | 84.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 5 | 12 | 11100.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 261.5 | 0.0 | 0.0 | 262.5 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3268.8 | 0.1 | 0.0 | 3280.9 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.2 | 7.6 | 1.2 | 0.0 | 0.4 | 0.3 | 1308.0 | 0.0 | 0.0 | 1308.4 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 326.9 | 0.0 | 0.0 | 328.1 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.3 | 6.7 | 2.3 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 915.3 | 0.0 | 0.0 | 918.7 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2288.2 | 0.1 | 0.0 | 2296.6 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 435.8 | 0.0 | 0.0 | 437.5 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 490.3 | 0.0 | 0.0 | 492.1 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 245.2 | 0.0 | 0.0 | 246.1 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 130.8 | 0.0 | 0.0 | 131.2 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 40533.0 | 1.7 | 0.4 | 40683.3 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19612.8 | 0.8 | 0.2 | 19685.5 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41404.7 | 1.7 | 0.4 | 41558.3 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.1 | 6.1 | 1.0 | 0.0 | 0.3 | 0.2 | 920.1 | 0.0 | 0.0 | 920.3 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18305.2 | 0.8 | 0.2 | 18373.1 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1634.4 | 0.1 | 0.0 | 1640.5 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 48378.1 | 2.0 | 0.4 | 48557.5 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 57.2 | 0.0 | 0.0 | 57.4 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.6 | 63.6 | 7.3 | 0.1 | 0.4 | 0.4 | 855.4 | 0.0 | 0.0 | 863.2 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Item | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | 5550.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.92 | 0.14 | | | | | | | | | 0.92 | 0.14 | | | | |
| | | | | | | | | | | | | | On Site Total | | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.7 | 85.7 | 16.7 | 0.2 | 2.2 | 1.3 | 184474.9 | 7.5 | 1.7 | 185145.1 |

| Item | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| | | | | | | | | | | | | | | | Total | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 8 | 5 | 243611 | 8 | 2 | 244474 |

**Project Construction**

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase 5 — TraPac Shaft — Start Date 2016

| Equipment | Type | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 2 | 6 | 3840.00 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 1 | 8 | 957.60 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 3.92 | 14.12 | 31.41 | 0.05 | 1.20 | 1.07 | 4652.56 | 0.35 | 0.00 | 4659.98 | 0.7 | 14.1 | 4.7 | 0.0 | 0.7 | 0.6 | 4652.6 | 0.1 | 0.0 | 4653.9 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 2.84 | 9.21 | 19.54 | 0.04 | 0.70 | 0.62 | 4439.05 | 0.26 | 0.00 | 4444.44 | 0.5 | 9.2 | 2.9 | 0.0 | 0.4 | 0.3 | 4439.1 | 0.0 | 0.0 | 4440.0 |
| Hydaulic Excavator - Medium | 0.80 | 2.56 | 5.99 | 0.01 | 0.20 | 0.18 | 1199.74 | 0.07 | 0.00 | 1201.26 | 0.1 | 2.6 | 0.9 | 0.0 | 0.1 | 0.1 | 1199.7 | 0.0 | 0.0 | 1200.0 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.3 | 6.7 | 2.3 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.0 |
| Motor Grader | 0.87 | 2.71 | 7.27 | 0.01 | 0.25 | 0.22 | 1187.64 | 0.08 | 0.00 | 1189.28 | 0.2 | 2.7 | 1.1 | 0.0 | 0.1 | 0.1 | 1187.6 | 0.0 | 0.0 | 1187.9 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.77 | 2.37 | 5.67 | 0.01 | 0.19 | 0.17 | 1079.77 | 0.07 | 0.00 | 1081.22 | 0.1 | 2.4 | 0.9 | 0.0 | 0.1 | 0.1 | 1079.8 | 0.0 | 0.0 | 1080.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| **On Site Total** | **11.3** | **38.7** | **87.8** | **0.2** | **3.6** | **2.8** | **15550.2** | **1.0** | **0.0** | **15571.2** | **2.3** | **38.7** | **15.6** | **0.2** | **2.2** | **1.6** | **15550.2** | **0.2** | **0.0** | **15554.0** |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 10.66 | 44.92 | 121.07 | 0.31 | 7.05 | 5.84 | 31697.93 | 0.09 | 0.08 | 31725.36 | 4.88 | 24.36 | 53.53 | 0.30 | 2.93 | 2.04 | 31697.93 | 0.09 | 0.08 | 31725.36 |
| On-Road Truck | 0.91 | 4.22 | 11.31 | 0.00 | 0.08 | 0.08 | 629.25 | 0.00 | 0.00 | 629.25 | 0.73 | 3.95 | 11.81 | 0.00 | 0.00 | 0.00 | 629.25 | 0.00 | 0.00 | 629.25 |
| On-Road Crew Vehicle | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 |
| On-Road Crew Vehicle | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 |
| **Total** | **23** | **88** | **217** | **0** | **11** | **9** | **48069** | **1** | **0** | **48130** | **8** | **67** | **78** | **0** | **5** | **4** | **48069** | **0** | **0** | **48113** |

Phase 6 — LAXT Shaft Site — Start Date 2015

| Equipment | Type | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 2 | 6 | 3840.00 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 1 | 8 | 957.60 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.8 | 14.9 | 5.1 | 0.0 | 0.7 | 0.6 | 4652.6 | 0.1 | 0.0 | 4654.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.5 | 9.4 | 3.3 | 0.0 | 0.4 | 0.4 | 4439.1 | 0.0 | 0.0 | 4440.1 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.2 | 2.6 | 1.0 | 0.0 | 0.1 | 0.1 | 1199.7 | 0.0 | 0.0 | 1200.0 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.4 | 6.9 | 2.5 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.1 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.2 | 2.8 | 1.2 | 0.0 | 0.2 | 0.1 | 1187.6 | 0.0 | 0.0 | 1188.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.1 | 2.4 | 1.0 | 0.0 | 0.1 | 0.1 | 1079.8 | 0.0 | 0.0 | 1080.1 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.4** | **40.1** | **17.0** | **0.2** | **2.4** | **1.8** | **15550.2** | **0.2** | **0.0** | **15554.2** |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

**Project Construction**

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

**Phase 7 — Assemble TBM** (Start Date 2016)

| Equipment | Type | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 0 | 6 | 0.00 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 0 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Phase 8 — Offshore Tunnel** (Start Date 2016)

| Equipment | Type | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 1 | 24 | 384.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 1 | 12 | 4800.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 2 | 6 | 1044.00 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 1 | 24 | 1344.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 200 | 200 | 1.00 | 1 | 24 | 4800.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 1 | 8 | 640.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 1 | 12 | 720.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 1 | 6 | 360.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 1 | 24 | 192.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 8000 | 8000 | 1.00 | 1 | 12 | 96000.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 3760 | 3760 | 1.00 | 1 | 12 | 45120.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 1 | 19 | 60800.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 1 | 12 | 734.40 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 1 | 12 | 26880.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 3600 | 3600 | 1.00 | 1 | 24 | 86400.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 1 | 3 | 84.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 5 | 12 | 11100.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 261.5 | 0.0 | 0.0 | 262.5 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3268.8 | 0.1 | 0.0 | 3280.9 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.2 | 7.6 | 1.2 | 0.0 | 0.4 | 0.3 | 1308.0 | 0.0 | 0.0 | 1308.4 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 326.9 | 0.0 | 0.0 | 328.1 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.3 | 6.7 | 2.3 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 915.3 | 0.0 | 0.0 | 918.7 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3268.8 | 0.1 | 0.0 | 3280.9 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 435.8 | 0.0 | 0.0 | 437.5 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 490.3 | 0.0 | 0.0 | 492.1 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 245.2 | 0.0 | 0.0 | 246.1 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 130.8 | 0.0 | 0.0 | 131.2 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 65375.9 | 2.7 | 0.6 | 65618.3 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30726.7 | 1.3 | 0.3 | 30840.6 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41404.7 | 1.7 | 0.4 | 41558.3 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.1 | 6.1 | 1.0 | 0.0 | 0.3 | 0.2 | 920.1 | 0.0 | 0.0 | 920.3 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18305.2 | 0.8 | 0.2 | 18373.1 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1634.4 | 0.1 | 0.0 | 1640.5 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 58838.3 | 2.4 | 0.5 | 59056.5 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 57.2 | 0.0 | 0.0 | 57.4 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.6 | 63.6 | 7.3 | 0.1 | 0.4 | 0.4 | 855.4 | 0.0 | 0.0 | 863.2 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 282 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 7050.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 |
| Fugitive Dust | | | | | 1.17 | 0.18 | | | | | | | | | 1.17 | 0.18 | | | | |
| On Site Total | 10.8 | 86.2 | 149.5 | 0.2 | 6.2 | 5.0 | 231945.3 | 9.8 | 2.1 | 232797.4 | 4.8 | 86.2 | 18.0 | 0.2 | 2.5 | 1.4 | 231945.3 | 9.5 | 2.1 | 232791.4 |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 282 | 16920 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 282 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 23.12 | 97.45 | 262.63 | 0.68 | 15.30 | 12.66 | 68760.13 | 0.19 | 0.18 | 68819.63 | 10.58 | 52.84 | 116.11 | 0.64 | 6.36 | 4.42 | 68760.13 | 0.19 | 0.18 | 68819.63 |
| On-Road Truck | 1.97 | 9.15 | 24.53 | 0.00 | 0.18 | 0.17 | 1364.98 | 0.00 | 0.00 | 1364.98 | 1.58 | 8.57 | 25.62 | 0.00 | 0.00 | 0.00 | 1364.98 | 0.00 | 0.00 | 1364.98 |
| On-Road Crew Vehicle | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| Total | 37.04 | 206 | 432 | 1 | 22 | 18 | 305929 | 10 | 3 | 306986 | 18 | 161 | 155 | 1 | 9 | 6 | 305929 | 10 | 3 | 306980 |

**Project Construction**

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

**Phase 9 — SW Marine**, Start Date 2015

| Equipment | Type | Equipment Specs: HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 2 | 6 | 3840.00 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 1 | 8 | 957.60 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 0 | 2 | 0.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.8 | 14.9 | 5.1 | 0.0 | 0.7 | 0.6 | 4652.6 | 0.1 | 0.0 | 4654.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.5 | 9.4 | 3.3 | 0.0 | 0.4 | 0.4 | 4439.1 | 0.0 | 0.0 | 4440.1 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.2 | 2.6 | 1.0 | 0.0 | 0.1 | 0.1 | 1199.7 | 0.0 | 0.0 | 1200.0 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.4 | 6.9 | 2.5 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.1 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.2 | 2.8 | 1.2 | 0.0 | 0.2 | 0.1 | 1187.6 | 0.0 | 0.0 | 1188.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.1 | 2.4 | 1.0 | 0.0 | 0.1 | 0.1 | 1079.8 | 0.0 | 0.0 | 1080.1 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.4** | **40.1** | **17.0** | **0.2** | **2.4** | **1.8** | **15550.2** | **0.2** | **0.0** | **15554.2** |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

**Phase 10 — SP Riser**, Start Date 2019

| Equipment | Type | Equipment Specs: HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 0 | 6 | 0.00 | g/hp-hr | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 3 | 2 | 2418.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 3 | 2 | 147.06 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 3 | 2 | 1080.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 3 | 2 | 64.50 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 1 | 2 | 450.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 | 1.2 | 26.7 | 21.8 | 0.0 | 0.6 | 0.5 | 4882.5 | 0.0 | 0.2 | 4951.8 |
| Tugboat - Aux | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 | 0.1 | 1.6 | 1.3 | 0.0 | 0.0 | 0.0 | 296.9 | 0.0 | 0.0 | 301.2 |
| Crew Boats | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 | 0.5 | 11.9 | 9.7 | 0.0 | 0.3 | 0.2 | 2180.8 | 0.0 | 0.1 | 2211.7 |
| Crew Boats - Aux | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 | 0.0 | 0.7 | 0.6 | 0.0 | 0.0 | 0.0 | 130.2 | 0.0 | 0.0 | 132.1 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.2 | 5.0 | 0.6 | 0.0 | 0.1 | 0.1 | 908.6 | 0.0 | 0.0 | 921.5 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.07 | 0.01 | | | | |
| **On Site Total** | **2.1** | **46.0** | **37.8** | **0.1** | **1.1** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.7** | **2.1** | **46.0** | **34.4** | **0.1** | **1.0** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.6** |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.96 | 4.30 | 10.46 | 0.04 | 0.65 | 0.52 | 3899.45 | 0.01 | 0.01 | 3902.82 | 0.60 | 3.02 | 6.30 | 0.04 | 0.37 | 0.26 | 3899.45 | 0.01 | 0.01 | 3902.82 |
| On-Road Truck | 0.10 | 0.51 | 1.42 | 0.00 | 0.01 | 0.01 | 77.47 | 0.00 | 0.00 | 77.47 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.47 | 0.00 | 0.00 | 77.47 |
| On-Road Crew Vehicle | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 |
| On-Road Crew Vehicle | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 |
| **Total** | **3** | **52** | **49** | **0** | **2** | **1** | **12898** | **0** | **0** | **13037** | **3** | **51** | **42** | **0** | **1** | **1** | **12898** | **0** | **0** | **13037** |

**Project Construction**

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase 11 — SP Diffuser — Start Date 2021

| Equipment | Type | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 0 | 6 | 0.00 | g/hp-hr | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 2 | 2 | 1612.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 1 | 2 | 360.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 1 | 2 | 21.50 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 1 | 8 | 2580.00 | g/hp-hr | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 1 | 8 | 9440.00 | g/hp-hr | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 2 | 8 | 5920.00 | g/hp-hr | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 1 | 2 | 450.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 1 | 4 | 510.00 | g/hp-hr | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 1 | 8 | 2960.00 | g/hp-hr | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |

| Equipment | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.8 | 17.8 | 14.5 | 0.0 | 0.4 | 0.4 | 3255.0 | 0.0 | 0.1 | 3301.2 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.0 | 1.1 | 0.9 | 0.0 | 0.0 | 0.0 | 198.0 | 0.0 | 0.0 | 200.8 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.2 | 4.0 | 3.2 | 0.0 | 0.1 | 0.1 | 726.9 | 0.0 | 0.0 | 737.2 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 43.4 | 0.0 | 0.0 | 44.0 |
| Crane Barge | 0.86 | 5.70 | 3.38 | 0.03 | 0.10 | 0.09 | 3232.39 | 0.08 | 0.00 | 3234.03 | 0.2 | 5.7 | 0.5 | 0.0 | 0.1 | 0.1 | 3232.4 | 0.0 | 0.0 | 3232.7 |
| Pipe Barge | 7.35 | 24.46 | 76.05 | 0.12 | 1.82 | 1.62 | 11827.05 | 0.66 | 0.00 | 11840.97 | 1.3 | 24.5 | 11.4 | 0.1 | 1.0 | 0.9 | 11827.1 | 0.1 | 0.0 | 11829.6 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 3.85 | 14.31 | 22.92 | 0.07 | 0.84 | 0.75 | 7416.97 | 0.35 | 0.00 | 7424.26 | 0.7 | 14.3 | 3.4 | 0.1 | 0.5 | 0.4 | 7417.0 | 0.1 | 0.0 | 7418.3 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.2 | 5.0 | 0.6 | 0.0 | 0.1 | 0.1 | 908.6 | 0.0 | 0.0 | 921.5 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.33 | 1.27 | 2.20 | 0.01 | 0.07 | 0.07 | 638.96 | 0.03 | 0.00 | 639.58 | 0.1 | 1.3 | 0.3 | 0.0 | 0.0 | 0.0 | 639.0 | 0.0 | 0.0 | 639.1 |
| Pump | 1.30 | 6.65 | 10.84 | 0.04 | 0.36 | 0.32 | 3708.48 | 0.12 | 0.00 | 3710.94 | 0.2 | 6.7 | 1.6 | 0.0 | 0.2 | 0.2 | 3708.5 | 0.0 | 0.0 | 3708.9 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | 400.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.07 | 0.01 | | | | | | | | | 0.07 | 0.01 | | | | |
| | | | | | | | | | | | | | | **On Site Total** | **15.0** | **80.5** | **138.6** | **0.3** | **3.9** | **3.4** | **31975.2** | **1.3** | **0.2** | **32074.0** | **3.8** | **80.5** | **37.1** | **0.3** | **2.4** | **2.1** | **31975.2** | **0.3** | **0.2** | **32052.7** |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 | 0.80 | 3.75 | 8.59 | 0.04 | 0.55 | 0.42 | 3909.79 | 0.01 | 0.01 | 3913.16 | 0.60 | 3.00 | 6.17 | 0.04 | 0.38 | 0.27 | 3909.79 | 0.01 | 0.01 | 3913.16 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 | 0.10 | 0.50 | 1.43 | 0.00 | 0.01 | 0.01 | 78.10 | 0.00 | 0.00 | 78.10 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.10 | 0.00 | 0.00 | 78.10 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 |
| | | | | | | | | | | | | | | | **Total** | **16** | **86** | **148** | **0** | **4** | **4** | **36467** | **1** | **0** | **36585** | **5** | **85** | **44** | **0** | **3** | **2** | **36467** | **0** | **0** | **36564** |

Phase 12 — Existing Ocean — Start Date 2021

| Equipment | Type | HP | kW | Power | LF | Number | Equipment | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 0 | 120 | 0.55 | 0 | 18 | 0.00 | g/hp-hr | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | offroad | 0 | 16 | 16 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | 0 | 400 | 400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 0 | 500 | 0.64 | 0 | 6 | 0.00 | g/hp-hr | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | offroad | 145 | 0 | 145 | 0.60 | 0 | 6 | 0.00 | g/hp-hr | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 0 | 518 | 0.57 | 0 | 12 | 0.00 | g/hp-hr | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 0 | 210 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | offroad | 349 | 0 | 349 | 0.54 | 0 | 6 | 0.00 | g/hp-hr | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | offroad | 259 | 0 | 259 | 0.61 | 0 | 6 | 0.00 | g/hp-hr | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | offroad | 0 | 56 | 56 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | 0 | 140 | 140 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | 0 | 80 | 80 | 1.00 | 0 | 8 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | 0 | 60 | 60 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | 0 | 60 | 60 | 1.00 | 0 | 6 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | 0 | 8 | 8 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | 0 | 4960 | 4960 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | 0 | 2400 | 2400 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | 0 | 3200 | 3200 | 1.00 | 0 | 19 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 0 | 90 | 0.68 | 0 | 12 | 0.00 | g/hp-hr | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | offroad | 0 | 2240 | 2240 | 1.00 | 0 | 12 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | 0 | 2960 | 2960 | 1.00 | 0 | 24 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 0 | 189 | 0.57 | 0 | 8 | 0.00 | g/hp-hr | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | offroad | 0 | 28 | 28 | 1.00 | 0 | 3 | 0.00 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1300 | 0 | 1300 | 0.31 | 2 | 2 | 1612.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 0 | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 0 | 400 | 0.45 | 1 | 2 | 360.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 0 | 25 | 0.43 | 1 | 2 | 21.50 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 0 | 750 | 0.43 | 0 | 8 | 0.00 | g/hp-hr | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | offroad | 2000 | 0 | 2000 | 0.59 | 0 | 8 | 0.00 | g/hp-hr | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | offroad | 250 | 0 | 250 | 0.51 | 0 | 8 | 0.00 | g/hp-hr | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | offroad | 500 | 0 | 500 | 0.45 | 1 | 2 | 450.00 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 0 | 185 | 1.00 | 0 | 12 | 0.00 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 0 | 250 | 0.51 | 0 | 4 | 0.00 | g/hp-hr | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | offroad | 500 | 0 | 500 | 0.74 | 0 | 8 | 0.00 | g/hp-hr | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |

| Equipment | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.8 | 17.8 | 14.5 | 0.0 | 0.4 | 0.4 | 3255.0 | 0.0 | 0.1 | 3301.2 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.0 | 1.1 | 0.9 | 0.0 | 0.0 | 0.0 | 198.0 | 0.0 | 0.0 | 200.8 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.2 | 4.0 | 3.2 | 0.0 | 0.1 | 0.1 | 726.9 | 0.0 | 0.0 | 737.2 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 43.4 | 0.0 | 0.0 | 44.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.2 | 5.0 | 0.6 | 0.0 | 0.1 | 0.1 | 908.6 | 0.0 | 0.0 | 921.5 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 0 | 5 | | g/idle-hr | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0.00 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | **On Site Total** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** | **1.3** | **28.0** | **19.4** | **0.0** | **0.6** | **0.5** | **5131.9** | **0.0** | **0.2** | **5204.7** |

| Equipment | Type | Miles / | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 |
| | | | | | | | | | | | | | | | **Total** | **1** | **29** | **23** | **0** | **1** | **1** | **5481** | **0** | **0** | **5564** | **1** | **29** | **20** | **0** | **1** | **1** | **5481** | **0** | **0** | **5564** |

**Project Construction - Alternative 1**

## EMISSIONS BY PHASE

**PROJECT**

| Phase | Start Date | Duration (Months) | Unmitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 24 | 11 | 86 | 148 | 0 | 6 | 5 | 184,475 | 8 | 2 | 185,151 | 5 | 86 | 17 | 0 | 2 | 1 | 184,475 | 8 | 2 | 185,145 |
| 5 TraPac Shaft Site Construction | 4/1/2016 | 12 | 11 | 39 | 88 | 0 | 4 | 3 | 15,550 | 1 | - | 15,571 | 2.257 | 39 | 16 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 6 LAXT Shaft Site Construction | 1/1/2015 | 15 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 7 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 Offshore Tunnel | 7/1/2016 | 79 | 11 | 86 | 149 | 0 | 6 | 5 | 231,945 | 10 | 2 | 232,797 | 5 | 86 | 18 | 0 | 2 | 1 | 231,945 | 9 | 2 | 232,791 |
| 9 SW Marine Shaft Site Construction | 7/1/2015 | 12 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 10 SP Riser Construction | 10/1/2019 | 24 | 2 | 46 | 38 | 0 | 1 | 1 | 8,419 | 0 | 0 | 8,538 | 2 | 46 | 34 | 0 | 1 | 1 | 8,419 | 0 | 0 | 8,538 |
| 11 SP Diffuser Construction | 10/1/2021 | 12 | 15 | 81 | 139 | 0 | 4 | 3 | 31,975 | 1 | 0 | 32,074 | 4 | 81 | 37 | 0 | 2 | 2 | 31,975 | 0 | 0 | 32,053 |
| 12 Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 1 | 28 | 23 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 | 1 | 28 | 19 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 |

| Phase | Start Date | Duration (Months) | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 24 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 8 | 2 | 244,474 |
| 5 TraPac Shaft Site Construction | 4/1/2016 | 12 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| 6 LAXT Shaft Site Construction | 1/1/2015 | 15 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 7 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 Offshore Tunnel | 7/1/2016 | 79 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| 9 SW Marine Shaft Site Construction | 7/1/2015 | 12 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 10 SP Riser Construction | 10/1/2019 | 24 | 3 | 52 | 49 | 0 | 2 | 1 | 12,898 | 0 | 0 | 13,037 | 3 | 51 | 42 | 0 | 1 | 1 | 12,898 | 0 | 0 | 13,037 |
| 11 SP Diffuser Construction | 10/1/2021 | 12 | 16 | 86 | 148 | 0 | 4 | 4 | 36,467 | 1 | 0 | 36,585 | 5 | 85 | 44 | 0 | 3 | 2 | 36,467 | 0 | 0 | 36,564 |
| 12 Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 1 | 28.906 | 23 | 0 | 1 | 1 | 5,481 | 0 | 0 | 5,564 | 1 | 29 | 20 | 0 | 1 | 1 | 5,481 | 0 | 0 | 5,564 |

**Project Construction - Alternative 1**

## EMISSIONS BY DAY

| | | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Timeslice | Phase | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| A | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **49** | **188** | **488** | **1** | **24** | **20** | **96,094** | **2** | **0** | **96,218** | **16** | **137** | **163** | **1** | **10** | **7** | **96,094** | **1** | **0** | **96,181** |
| B | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **74** | **282** | **732** | **1** | **36** | **29** | **144,140** | **4** | **0** | **144,327** | **24** | **205** | **244** | **1** | **16** | **11** | **144,140** | **1** | **0** | **144,272** |
| C | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| D | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **48** | **182** | **461** | **1** | **23** | **19** | **96,116** | **2** | **0** | **96,239** | **16** | **136** | **159** | **1** | **10** | **7** | **96,116** | **1** | **0** | **96,204** |
| E | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 8 | 2 | 244,474 |
| | 5 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **92** | **477** | **1,020** | **2** | **51** | **42** | **597,610** | **20** | **5** | **599,596** | **41** | **375** | **358** | **2** | **22** | **15** | **597,610** | **19** | **5** | **599,566** |
| F | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 8 | 2 | 244,474 |
| | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **69** | **389** | **802** | **2** | **40** | **33** | **549,540** | **19** | **5** | **551,466** | **34** | **308** | **279** | **2** | **17** | **11** | **549,540** | **18** | **5** | **551,454** |
| G | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **37** | **206** | **432** | **1** | **22** | **18** | **305,929** | **10** | **3** | **306,986** | **18** | **161** | **155** | **1** | **9** | **6** | **305,929** | **10** | **3** | **306,980** |
| H | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | 10 | 3 | 52 | 49 | 0 | 2 | 1 | 12,898 | 0 | 0 | 13,037 | 3 | 51 | 42 | 0 | 1 | 1 | 12,898 | 0 | 0 | 13,037 |
| | **Total** | **40** | **258** | **481** | **1** | **24** | **19** | **318,827** | **11** | **3** | **320,023** | **21** | **211** | **197** | **1** | **11** | **7** | **318,827** | **10** | **3** | **320,017** |
| I | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | 11 | 16 | 86 | 148 | 0 | 4 | 4 | 36,467 | 1 | 0 | 36,585 | 5 | 85 | 44 | 0 | 3 | 2 | 36,467 | 0 | 0 | 36,564 |
| | 12 | 1 | 29 | 23 | 0 | 1 | 1 | 5,481 | 0 | 0 | 5,564 | 1 | 29 | 20 | 0 | 1 | 1 | 5,481 | 0 | 0 | 5,564 |
| | **Total** | **54** | **321** | **603** | **1** | **27** | **22** | **347,877** | **12** | **3** | **349,135** | **24** | **275** | **219** | **1** | **13** | **9** | **347,877** | **11** | **3** | **349,107** |
| J | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | 11 | 16 | 86 | 148 | 0 | 4 | 4 | 36,467 | 1 | 0 | 36,585 | 5 | 85 | 44 | 0 | 3 | 2 | 36,467 | 0 | 0 | 36,564 |
| | **Total** | **53** | **292** | **580** | **1** | **26** | **22** | **342,396** | **12** | **3** | **343,571** | **23** | **246** | **199** | **1** | **12** | **8** | **342,396** | **10** | **3** | **343,543** |
| K | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **37** | **206** | **432** | **1** | **22** | **18** | **305,929** | **10** | **3** | **306,986** | **18** | **161** | **155** | **1** | **9** | **6** | **305,929** | **10** | **3** | **306,980** |
| **Maximum Daily Emissions** | | **92** | **477** | **1,020** | **2** | **51** | **42** | **597,610** | **20** | **5** | **599,596** | **41** | **375** | **358** | **2** | **22** | **15** | **597,610** | **19** | **5** | **599,566** |

## Project Construction - Alternative 1

# GHG EMISSIONS BY PHASE

| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | 7/1/2016 | 24 | 59,073 | 2 | 1 | 59,284 | 59,073 | 2 | 1 | 59,283 |
| 5 | TraPac Shaft Site Construction | 4/1/2016 | 12 | 5,820 | 0 | 0 | 5,828 | 5,820 | 0 | 0 | 5,825 |
| 6 | LAXT Shaft Site Construction | 1/1/2015 | 15 | 7,272 | 0 | 0 | 7,281 | 7,272 | 0 | 0 | 7,278 |
| 7 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 8 | Offshore Tunnel | 7/1/2016 | 79 | 241,584 | 8 | 2 | 242,419 | 241,584 | 8 | 2 | 242,414 |
| 9 | SW Marine Shaft Site Construction | 7/1/2015 | 12 | 5,833 | 0 | 0 | 5,841 | 5,833 | 0 | 0 | 5,839 |
| 10 | SP Riser Construction | 10/1/2019 | 24 | 3,132 | 0 | 0 | 3,166 | 3,132 | 0 | 0 | 3,166 |
| 11 | SP Diffuser Construction | 10/1/2021 | 12 | 4,415 | 0 | 0 | 4,430 | 4,415 | 0 | 0 | 4,427 |
| 12 | Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 496 | 0 | 0 | 503 | 496 | 0 | 0 | 503 |
| | Total | | | | | | 334,576 | | | | 334,558 |
| | Amortized Total | | | | | | 11,153 | | | | 11,152 |

# Emission Factors and Mitigation Reductions for all Project Construction Phases and Alternatives

Project Construction

# OFFROAD EMISSION FACTORS

| | | | | | | | | OFFROAD Output (tons per day) | | | | | | | | | Emission Factors (g/hp-hr) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CY | Season | Equipment | Fuel | MaxHP | AveHP | Class | Activity | ROG Exhaust | CO Exhaust | NOX Exhaust | CO2 Exhaust | SO2 Exhaust | PM Exhaust | N2O Exhaust | CH4 Exhaust | LoadFactor | ROG | CO | NOX | SO2 | PM10 | PM25 | CO2 | CH4 | N2O |
| 2014 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 6.78E+01 | 4.00E-03 | 1.18E-02 | 3.44E-02 | 5.37E+00 | 6.05E-05 | 1.13E-03 | 0.00E+00 | 3.61E-04 | 0.57 | 0.423 | 1.246 | 3.642 | 0.006 | 0.120 | 0.107 | 568.300 | 0.038 | 0.000 |
| 2014 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 4.89E+01 | 4.05E-03 | 1.25E-02 | 3.22E-02 | 5.71E+00 | 5.60E-05 | 1.13E-03 | 0.00E+00 | 3.66E-04 | 0.57 | 0.403 | 1.239 | 3.206 | 0.006 | 0.113 | 0.100 | 568.300 | 0.036 | 0.000 |
| 2014 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.03E+01 | 2.13E-03 | 6.31E-03 | 1.96E-02 | 2.60E+00 | 2.93E-05 | 6.75E-04 | 0.00E+00 | 1.92E-04 | 0.61 | 0.465 | 1.377 | 4.270 | 0.006 | 0.147 | 0.131 | 568.300 | 0.042 | 0.000 |
| 2014 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.24E+01 | 7.91E-04 | 4.49E-03 | 6.08E-03 | 7.74E-01 | 8.71E-06 | 3.34E-04 | 0.00E+00 | 7.14E-05 | 0.60 | 0.581 | 3.299 | 4.466 | 0.006 | 0.245 | 0.218 | 568.300 | 0.052 | 0.000 |
| 2014 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.71E+01 | 2.39E-03 | 8.20E-03 | 2.10E-02 | 3.20E+00 | 3.14E-05 | 7.49E-04 | 0.00E+00 | 2.16E-04 | 0.54 | 0.425 | 1.455 | 3.732 | 0.006 | 0.133 | 0.118 | 568.300 | 0.038 | 0.000 |
| 2014 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.50E+02 | 1.12E-02 | 6.13E-02 | 7.46E-02 | 9.04E+00 | 1.06E-04 | 5.95E-03 | 0.00E+00 | 1.01E-03 | 0.55 | 0.704 | 3.853 | 4.694 | 0.007 | 0.374 | 0.333 | 568.300 | 0.064 | 0.000 |
| 2014 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.67E+01 | 3.22E-03 | 1.18E-02 | 2.75E-02 | 3.45E+00 | 3.39E-05 | 1.06E-03 | 0.00E+00 | 2.90E-04 | 0.64 | 0.512 | 1.873 | 4.383 | 0.005 | 0.169 | 0.150 | 549.583 | 0.046 | 0.000 |
| 2014 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.16E+01 | 1.41E-03 | 7.92E-03 | 9.63E-03 | 1.19E+00 | 1.39E-05 | 7.68E-04 | 0.00E+00 | 1.27E-04 | 0.68 | 0.676 | 3.798 | 4.616 | 0.007 | 0.368 | 0.328 | 568.300 | 0.061 | 0.000 |
| 2014 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.53E+01 | 1.02E-03 | 2.88E-03 | 8.52E-03 | 1.28E+00 | 1.44E-05 | 2.83E-04 | 0.00E+00 | 9.18E-05 | 0.57 | 0.453 | 1.283 | 3.796 | 0.006 | 0.126 | 0.112 | 568.299 | 0.041 | 0.000 |
| 2014 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.29E+01 | 4.26E-03 | 1.30E-02 | 4.79E-02 | 4.78E+00 | 4.69E-05 | 1.42E-03 | 0.00E+00 | 3.85E-04 | 0.59 | 0.507 | 1.550 | 5.697 | 0.006 | 0.168 | 0.150 | 568.300 | 0.046 | 0.000 |
| 2014 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 1.27E-05 | 5.39E-05 | 1.20E-04 | 3.05E-02 | 3.00E-07 | 3.93E-06 | 0.00E+00 | 1.14E-06 | 0.43 | 0.235 | 1.003 | 2.233 | 0.006 | 0.073 | 0.065 | 568.300 | 0.021 | 0.000 |
| 2014 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 1.18E-04 | 3.58E-04 | 1.23E-03 | 1.57E-01 | 1.77E-06 | 3.98E-05 | 0.00E+00 | 1.07E-05 | 0.51 | 0.428 | 1.295 | 4.446 | 0.006 | 0.144 | 0.128 | 568.300 | 0.039 | 0.000 |
| 2014 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 6.16E-05 | 2.48E-04 | 7.39E-04 | 1.14E-01 | 1.12E-06 | 2.29E-05 | 0.00E+00 | 5.55E-06 | 0.74 | 0.307 | 1.238 | 3.685 | 0.006 | 0.114 | 0.102 | 568.300 | 0.028 | 0.000 |
| 2014 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 4.03E-04 | 1.29E-03 | 3.83E-03 | 5.54E-01 | 5.44E-06 | 1.32E-04 | 0.00E+00 | 3.64E-05 | 0.74 | 0.413 | 1.323 | 3.924 | 0.006 | 0.136 | 0.121 | 568.300 | 0.037 | 0.000 |
| 2014 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 9.70E-06 | 2.93E-05 | 1.01E-04 | 1.29E-02 | 1.45E-07 | 3.26E-06 | 0.00E+00 | 8.75E-07 | 0.51 | 0.428 | 1.295 | 4.446 | 0.006 | 0.144 | 0.128 | 568.300 | 0.039 | 0.000 |
| 2015 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 6.87E+01 | 3.84E-03 | 1.18E-02 | 3.09E-02 | 5.45E+00 | 6.13E-05 | 1.02E-03 | 0.00E+00 | 3.47E-04 | 0.57 | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| 2015 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 4.96E+01 | 3.91E-03 | 1.23E-02 | 2.89E-02 | 5.79E+00 | 5.68E-05 | 1.03E-03 | 0.00E+00 | 3.53E-04 | 0.57 | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| 2015 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.07E+01 | 2.04E-03 | 6.20E-03 | 1.79E-02 | 2.64E+00 | 2.97E-05 | 6.15E-04 | 0.00E+00 | 1.84E-04 | 0.61 | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| 2015 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.26E+01 | 7.43E-04 | 4.55E-03 | 5.54E-03 | 7.85E-01 | 8.84E-06 | 3.03E-04 | 0.00E+00 | 6.70E-05 | 0.60 | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| 2015 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.74E+01 | 2.30E-03 | 7.96E-03 | 1.93E-02 | 3.25E+00 | 3.19E-05 | 6.85E-04 | 0.00E+00 | 2.08E-04 | 0.54 | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| 2015 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.54E+02 | 1.03E-02 | 6.17E-02 | 6.89E-02 | 9.16E+00 | 1.07E-04 | 5.26E-03 | 0.00E+00 | 9.31E-04 | 0.55 | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| 2015 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.70E+01 | 3.10E-03 | 1.12E-02 | 2.57E-02 | 3.50E+00 | 3.43E-05 | 9.86E-04 | 0.00E+00 | 2.80E-04 | 0.64 | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| 2015 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.26E+01 | 1.28E-03 | 8.09E-03 | 8.93E-03 | 1.22E+00 | 1.43E-05 | 6.66E-04 | 0.00E+00 | 1.15E-04 | 0.68 | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| 2015 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.56E+01 | 9.74E-04 | 2.87E-03 | 7.69E-03 | 1.29E+00 | 1.46E-05 | 2.56E-04 | 0.00E+00 | 8.79E-05 | 0.57 | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| 2015 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.29E+01 | 3.99E-03 | 1.19E-02 | 4.47E-02 | 4.78E+00 | 4.69E-05 | 1.29E-03 | 0.00E+00 | 3.60E-04 | 0.59 | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| 2015 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 1.20E-05 | 5.39E-05 | 1.03E-04 | 3.05E-02 | 3.00E-07 | 3.37E-06 | 0.00E+00 | 1.08E-06 | 0.43 | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| 2015 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 1.12E-04 | 3.49E-04 | 1.12E-03 | 1.57E-01 | 1.77E-06 | 3.62E-05 | 0.00E+00 | 1.01E-05 | 0.51 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| 2015 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 5.74E-05 | 2.37E-04 | 6.67E-04 | 1.14E-01 | 1.12E-06 | 2.08E-05 | 0.00E+00 | 5.18E-06 | 0.74 | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |
| 2015 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 3.85E-04 | 1.23E-03 | 3.45E-03 | 5.54E-01 | 5.44E-06 | 1.20E-04 | 0.00E+00 | 3.47E-05 | 0.74 | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| 2015 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 9.17E-06 | 2.85E-05 | 9.14E-05 | 1.29E-02 | 1.45E-07 | 2.96E-06 | 0.00E+00 | 8.28E-07 | 0.51 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| 2016 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 6.97E+01 | 3.68E-03 | 1.18E-02 | 2.76E-02 | 5.52E+00 | 6.22E-05 | 9.18E-04 | 0.00E+00 | 3.32E-04 | 0.57 | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| 2016 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 5.03E+01 | 3.76E-03 | 1.22E-02 | 2.58E-02 | 5.87E+00 | 5.76E-05 | 9.22E-04 | 0.00E+00 | 3.39E-04 | 0.57 | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| 2016 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.11E+01 | 1.95E-03 | 6.12E-03 | 1.64E-02 | 2.68E+00 | 3.01E-05 | 5.60E-04 | 0.00E+00 | 1.76E-04 | 0.61 | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| 2016 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.28E+01 | 6.95E-04 | 4.62E-03 | 5.01E-03 | 7.97E-01 | 8.96E-06 | 2.72E-04 | 0.00E+00 | 6.27E-05 | 0.60 | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| 2016 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.78E+01 | 2.22E-03 | 7.76E-03 | 1.76E-02 | 3.29E+00 | 3.23E-05 | 6.26E-04 | 0.00E+00 | 2.00E-04 | 0.54 | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| 2016 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.59E+02 | 9.50E-03 | 6.21E-02 | 6.36E-02 | 9.28E+00 | 1.09E-04 | 4.60E-03 | 0.00E+00 | 8.57E-04 | 0.55 | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| 2016 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.74E+01 | 2.98E-03 | 1.08E-02 | 2.39E-02 | 3.54E+00 | 3.48E-05 | 9.14E-04 | 0.00E+00 | 2.69E-04 | 0.64 | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| 2016 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.32E+01 | 1.15E-03 | 8.20E-03 | 8.22E-03 | 1.24E+00 | 1.46E-05 | 5.66E-04 | 0.00E+00 | 1.03E-04 | 0.68 | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| 2016 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.58E+01 | 9.31E-04 | 2.88E-03 | 6.89E-03 | 1.31E+00 | 1.48E-05 | 2.30E-04 | 0.00E+00 | 8.40E-05 | 0.57 | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| 2016 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.29E+01 | 3.79E-03 | 1.13E-02 | 4.20E-02 | 4.78E+00 | 4.69E-05 | 1.18E-03 | 0.00E+00 | 3.42E-04 | 0.59 | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| 2016 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 1.13E-05 | 5.39E-05 | 8.73E-05 | 3.05E-02 | 3.00E-07 | 2.84E-06 | 0.00E+00 | 1.02E-06 | 0.43 | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| 2016 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 1.06E-04 | 3.40E-04 | 1.00E-03 | 1.57E-01 | 1.77E-06 | 3.26E-05 | 0.00E+00 | 9.56E-06 | 0.51 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| 2016 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 5.35E-05 | 2.27E-04 | 5.98E-04 | 1.14E-01 | 1.12E-06 | 1.88E-05 | 0.00E+00 | 4.82E-06 | 0.74 | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |
| 2016 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 3.67E-04 | 1.18E-03 | 3.09E-03 | 5.54E-01 | 5.44E-06 | 1.09E-04 | 0.00E+00 | 3.31E-05 | 0.74 | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| 2016 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 8.67E-06 | 2.78E-05 | 8.22E-05 | 1.29E-02 | 1.45E-07 | 2.67E-06 | 0.00E+00 | 7.82E-07 | 0.51 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| 2017 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 7.07E+01 | 3.51E-03 | 1.18E-02 | 2.44E-02 | 5.60E+00 | 6.30E-05 | 8.17E-04 | 0.00E+00 | 3.16E-04 | 0.57 | 0.356 | 1.200 | 2.477 | 0.006 | 0.083 | 0.074 | 568.300 | 0.032 | 0.000 |
| 2017 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 5.10E+01 | 3.60E-03 | 1.21E-02 | 2.30E-02 | 5.95E+00 | 5.84E-05 | 8.23E-04 | 0.00E+00 | 3.25E-04 | 0.57 | 0.344 | 1.157 | 2.193 | 0.006 | 0.079 | 0.070 | 568.300 | 0.031 | 0.000 |
| 2017 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.16E+01 | 1.87E-03 | 6.06E-03 | 1.49E-02 | 2.71E+00 | 3.05E-05 | 5.09E-04 | 0.00E+00 | 1.68E-04 | 0.61 | 0.391 | 1.270 | 3.127 | 0.006 | 0.107 | 0.095 | 568.300 | 0.035 | 0.000 |
| 2017 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.30E+01 | 6.44E-04 | 4.68E-03 | 4.47E-03 | 8.09E-01 | 9.10E-06 | 2.41E-04 | 0.00E+00 | 5.81E-05 | 0.60 | 0.453 | 3.289 | 3.142 | 0.006 | 0.169 | 0.151 | 568.300 | 0.041 | 0.000 |
| 2017 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.82E+01 | 2.14E-03 | 7.61E-03 | 1.60E-02 | 3.34E+00 | 3.28E-05 | 5.72E-04 | 0.00E+00 | 1.93E-04 | 0.54 | 0.364 | 1.296 | 2.722 | 0.006 | 0.097 | 0.087 | 568.300 | 0.033 | 0.000 |
| 2017 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.64E+02 | 8.75E-03 | 6.26E-02 | 5.87E-02 | 9.41E+00 | 1.10E-04 | 3.98E-03 | 0.00E+00 | 7.89E-04 | 0.55 | 0.528 | 3.783 | 3.547 | 0.007 | 0.241 | 0.214 | 568.300 | 0.048 | 0.000 |
| 2017 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.77E+01 | 2.87E-03 | 1.04E-02 | 2.22E-02 | 3.59E+00 | 3.52E-05 | 8.45E-04 | 0.00E+00 | 2.59E-04 | 0.64 | 0.439 | 1.591 | 3.405 | 0.005 | 0.129 | 0.115 | 549.583 | 0.040 | 0.000 |
| 2017 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.38E+01 | 1.06E-03 | 8.33E-03 | 7.64E-03 | 1.27E+00 | 1.49E-05 | 4.91E-04 | 0.00E+00 | 9.59E-05 | 0.68 | 0.476 | 3.732 | 3.422 | 0.007 | 0.220 | 0.196 | 568.300 | 0.043 | 0.000 |
| 2017 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.60E+01 | 8.87E-04 | 2.88E-03 | 6.13E-03 | 1.33E+00 | 1.50E-05 | 2.05E-04 | 0.00E+00 | 8.00E-05 | 0.57 | 0.379 | 1.230 | 2.617 | 0.006 | 0.088 | 0.078 | 568.300 | 0.034 | 0.000 |
| 2017 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.29E+01 | 3.62E-03 | 1.08E-02 | 3.96E-02 | 4.78E+00 | 4.69E-05 | 1.08E-03 | 0.00E+00 | 3.27E-04 | 0.59 | 0.431 | 1.289 | 4.705 | 0.006 | 0.129 | 0.115 | 568.300 | 0.039 | 0.000 |
| 2017 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 1.06E-05 | 5.39E-05 | 7.29E-05 | 3.05E-02 | 3.00E-07 | 2.31E-06 | 0.00E+00 | 9.57E-07 | 0.43 | 0.197 | 1.003 | 1.357 | 0.006 | 0.043 | 0.038 | 568.300 | 0.018 | 0.000 |
| 2017 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 1.00E-04 | 3.32E-04 | 8.96E-04 | 1.57E-01 | 1.77E-06 | 2.93E-05 | 0.00E+00 | 9.03E-06 | 0.51 | 0.362 | 1.201 | 3.237 | 0.006 | 0.106 | 0.094 | 568.300 | 0.033 | 0.000 |
| 2017 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 5.01E-05 | 2.19E-04 | 5.36E-04 | 1.14E-01 | 1.12E-06 | 1.70E-05 | 0.00E+00 | 4.52E-06 | 0.74 | 0.250 | 1.092 | 2.676 | 0.006 | 0.085 | 0.076 | 568.300 | 0.023 | 0.000 |
| 2017 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 3.50E-04 | 1.14E-03 | 2.77E-03 | 5.54E-01 | 5.44E-06 | 9.85E-05 | 0.00E+00 | 3.16E-05 | 0.74 | 0.359 | 1.171 | 2.842 | 0.006 | 0.101 | 0.090 | 568.300 | 0.032 | 0.000 |
| 2017 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 8.20E-06 | 2.72E-05 | 7.33E-05 | 1.29E-02 | 1.45E-07 | 2.40E-06 | 0.00E+00 | 7.40E-07 | 0.51 | 0.362 | 1.201 | 3.237 | 0.006 | 0.106 | 0.094 | 568.300 | 0.033 | 0.000 |
| 2018 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 7.18E+01 | 3.34E-03 | 1.19E-02 | 2.15E-02 | 5.69E+00 | 6.40E-05 | 7.23E-04 | 0.00E+00 | 3.01E-04 | 0.57 | 0.334 | 1.189 | 2.146 | 0.006 | 0.072 | 0.064 | 568.300 | 0.030 | 0.000 |
| 2018 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 5.18E+01 | 3.45E-03 | 1.21E-02 | 2.04E-02 | 6.04E+00 | 5.93E-05 | 7.34E-04 | 0.00E+00 | 3.12E-04 | 0.57 | 0.325 | 1.139 | 1.916 | 0.006 | 0.069 | 0.061 | 568.300 | 0.029 | 0.000 |
| 2018 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.20E+01 | 1.79E-03 | 6.04E-03 | 1.36E-02 | 2.75E+00 | 3.10E-05 | 4.62E-04 | 0.00E+00 | 1.61E-04 | 0.61 | 0.369 | 1.247 | 2.804 | 0.006 | 0.095 | 0.085 | 568.300 | 0.033 | 0.000 |
| 2018 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.32E+01 | 5.99E-04 | 4.75E-03 | 3.98E-03 | 8.21E-01 | 9.24E-06 | 2.12E-04 | 0.00E+00 | 5.40E-05 | 0.60 | 0.414 | 3.288 | 2.759 | 0.006 | 0.146 | 0.130 | 568.300 | 0.037 | 0.000 |
| 2018 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.86E+01 | 2.06E-03 | 7.50E-03 | 1.45E-02 | 3.39E+00 | 3.32E-05 | 5.21E-04 | 0.00E+00 | 1.86E-04 | 0.54 | 0.346 | 1.259 | 2.438 | 0.006 | 0.087 | 0.078 | 568.300 | 0.031 | 0.000 |
| 2018 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.69E+02 | 8.06E-03 | 6.32E-02 | 5.43E-02 | 9.54E+00 | 1.12E-04 | 3.41E-03 | 0.00E+00 | 7.27E-04 | 0.55 | 0.480 | 3.765 | 3.233 | 0.007 | 0.203 | 0.181 | 568.300 | 0.043 | 0.000 |
| 2018 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.81E+01 | 2.75E-03 | 1.01E-02 | 2.06E-02 | 3.64E+00 | 3.57E-05 | 7.78E-04 | 0.00E+00 | 2.48E-04 | 0.64 | 0.416 | 1.522 | 3.117 | 0.005 | 0.118 | 0.105 | 549.583 | 0.038 | 0.000 |
| 2018 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.45E+01 | 1.00E-03 | 8.47E-03 | 7.12E-03 | 1.29E+00 | 1.52E-05 | 4.29E-04 | 0.00E+00 | 9.06E-05 | 0.68 | 0.442 | 3.727 | 3.133 | 0.007 | 0.189 | 0.168 | 568.300 | 0.040 | 0.000 |
| 2018 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.62E+01 | 8.44E-04 | 2.89E-03 | 5.41E-03 | 1.35E+00 | 1.52E-05 | 1.83E-04 | 0.00E+00 | 7.61E-05 | 0.57 | 0.355 | 1.218 | 2.277 | 0.006 | 0.077 | 0.068 | 568.300 | 0.032 | 0.000 |
| 2018 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.29E+01 | 3.47E-03 | 1.05E-02 | 3.73E-02 | 4.78E+00 | 4.69E-05 | 9.95E-04 | 0.00E+00 | 3.13E-04 | 0.59 | 0.413 | 1.252 | 4.432 | 0.006 | 0.118 | 0.105 | 568.300 | 0.037 | 0.000 |
| 2018 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 9.88E-06 | 5.39E-05 | 5.97E-05 | 3.05E-02 | 3.00E-07 | 1.81E-06 | 0.00E+00 | 8.92E-07 | 0.43 | 0.184 | 1.003 | 1.111 | 0.006 | 0.034 | 0.030 | 568.300 | 0.017 | 0.000 |
| 2018 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 9.46E-05 | 3.26E-04 | 7.93E-04 | 1.57E-01 | 1.77E-06 | 2.62E-05 | 0.00E+00 | 8.54E-06 | 0.51 | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| 2018 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 4.72E-05 | 2.13E-04 | 4.80E-04 | 1.14E-01 | 1.12E-06 | 1.54E-05 | 0.00E+00 | 4.26E-06 | 0.74 | 0.236 | 1.064 | 2.395 | 0.006 | 0.077 | 0.068 | 568.300 | 0.021 | 0.000 |
| 2018 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 3.34E-04 | 1.11E-03 | 2.48E-03 | 5.54E-01 | 5.44E-06 | 8.90E-05 | 0.00E+00 | 3.01E-05 | 0.74 | 0.342 | 1.142 | 2.542 | 0.006 | 0.091 | 0.081 | 568.300 | 0.031 | 0.000 |
| 2018 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 7.75E-06 | 2.67E-05 | 6.49E-05 | 1.29E-02 | 1.45E-07 | 2.14E-06 | 0.00E+00 | 6.99E-07 | 0.51 | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| 2019 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 7.28E+01 | 3.18E-03 | 1.20E-02 | 1.88E-02 | 5.77E+00 | 6.50E-05 | 6.39E-04 | 0.00E+00 | 2.87E-04 | 0.57 | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| 2019 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 5.25E+01 | 3.31E-03 | 1.21E-02 | 1.81E-02 | 6.13E+00 | 6.02E-05 | 6.53E-04 | 0.00E+00 | 2.99E-04 | 0.57 | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| 2019 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.24E+01 | 1.71E-03 | 6.03E-03 | 1.23E-02 | 2.79E+00 | 3.14E-05 | 4.19E-04 | 0.00E+00 | 1.55E-04 | 0.61 | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| 2019 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.33E+01 | 5.62E-04 | 4.82E-03 | 3.56E-03 | 8.32E-01 | 9.37E-06 | 1.87E-04 | 0.00E+00 | 5.08E-05 | 0.60 | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| 2019 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.90E+01 | 1.99E-03 | 7.41E-03 | 1.31E-02 | 3.43E+00 | 3.37E-05 | 4.73E-04 | 0.00E+00 | 1.79E-04 | 0.54 | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| 2019 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.75E+02 | 7.45E-03 | 6.39E-02 | 5.03E-02 | 9.68E+00 | 1.14E-04 | 2.89E-03 | 0.00E+00 | 6.72E-04 | 0.55 | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| 2019 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.85E+01 | 2.64E-03 | 9.80E-03 | 1.91E-02 | 3.68E+00 | 3.62E-05 | 7.15E-04 | 0.00E+00 | 2.38E-04 | 0.64 | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| 2019 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.51E+01 | 9.55E-04 | 8.62E-03 | 6.65E-03 | 1.32E+00 | 1.54E-05 | 3.74E-04 | 0.00E+00 | 8.62E-05 | 0.68 | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| 2019 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.65E+01 | 8.06E-04 | 2.91E-03 | 4.77E-03 | 1.37E+00 | 1.54E-05 | 1.62E-04 | 0.00E+00 | 7.27E-05 | 0.57 | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| 2019 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.29E+01 | 3.32E-03 | 1.03E-02 | 3.51E-02 | 4.78E+00 | 4.69E-05 | 9.09E-04 | 0.00E+00 | 3.00E-04 | 0.59 | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| 2019 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 9.16E-06 | 5.39E-05 | 4.77E-05 | 3.05E-02 | 3.00E-07 | 1.34E-06 | 0.00E+00 | 8.26E-07 | 0.43 | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| 2019 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 8.95E-05 | 3.21E-04 | 7.00E-04 | 1.57E-01 | 1.77E-06 | 2.34E-05 | 0.00E+00 | 8.08E-06 | 0.51 | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| 2019 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 4.46E-05 | 2.09E-04 | 4.28E-04 | 1.14E-01 | 1.12E-06 | 1.38E-05 | 0.00E+00 | 4.02E-06 | 0.74 | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |
| 2019 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 3.18E-04 | 1.09E-03 | 2.21E-03 | 5.54E-01 | 5.44E-06 | 7.99E-05 | 0.00E+00 | 2.87E-05 | 0.74 | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| 2019 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 7.33E-06 | 2.63E-05 | 5.73E-05 | 1.29E-02 | 1.45E-07 | 1.91E-06 | 0.00E+00 | 6.61E-07 | 0.51 | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| 2020 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 7.38E+01 | 3.04E-03 | 1.21E-02 | 1.65E-02 | 5.85E+00 | 6.58E-05 | 5.65E-04 | 0.00E+00 | 2.75E-04 | 0.57 | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| 2020 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 5.32E+01 | 3.18E-03 | 1.22E-02 | 1.60E-02 | 6.22E+00 | 6.10E-05 | 5.80E-04 | 0.00E+00 | 2.87E-04 | 0.57 | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| 2020 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.29E+01 | 1.64E-03 | 6.04E-03 | 1.11E-02 | 2.82E+00 | 3.18E-05 | 3.79E-04 | 0.00E+00 | 1.48E-04 | 0.61 | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| 2020 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.35E+01 | 5.32E-04 | 4.88E-03 | 3.18E-03 | 8.44E-01 | 9.50E-06 | 1.66E-04 | 0.00E+00 | 4.80E-05 | 0.60 | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| 2020 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.94E+01 | 1.91E-03 | 7.36E-03 | 1.19E-02 | 3.48E+00 | 3.41E-05 | 4.29E-04 | 0.00E+00 | 1.73E-04 | 0.54 | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| 2020 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.80E+02 | 6.95E-03 | 6.46E-02 | 4.68E-02 | 9.82E+00 | 1.15E-04 | 2.45E-03 | 0.00E+00 | 6.27E-04 | 0.55 | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| 2020 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.88E+01 | 2.54E-03 | 9.58E-03 | 1.76E-02 | 3.73E+00 | 3.66E-05 | 6.57E-04 | 0.00E+00 | 2.29E-04 | 0.64 | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| 2020 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.57E+01 | 9.07E-04 | 8.77E-03 | 6.18E-03 | 1.34E+00 | 1.57E-05 | 3.18E-04 | 0.00E+00 | 8.19E-05 | 0.68 | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| 2020 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.67E+01 | 7.72E-04 | 2.93E-03 | 4.20E-03 | 1.39E+00 | 1.56E-05 | 1.44E-04 | 0.00E+00 | 6.97E-05 | 0.57 | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| 2020 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.29E+01 | 3.17E-03 | 1.01E-02 | 3.30E-02 | 4.78E+00 | 4.69E-05 | 8.25E-04 | 0.00E+00 | 2.86E-04 | 0.59 | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| 2020 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 8.64E-06 | 5.39E-05 | 3.92E-05 | 3.05E-02 | 3.00E-07 | 1.14E-06 | 0.00E+00 | 7.79E-07 | 0.43 | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| 2020 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 8.48E-05 | 3.17E-04 | 6.17E-04 | 1.57E-01 | 1.77E-06 | 2.08E-05 | 0.00E+00 | 7.65E-06 | 0.51 | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| 2020 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 4.21E-05 | 2.07E-04 | 3.78E-04 | 1.14E-01 | 1.12E-06 | 1.24E-05 | 0.00E+00 | 3.80E-06 | 0.74 | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |
| 2020 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 3.03E-04 | 1.08E-03 | 1.95E-03 | 5.54E-01 | 5.44E-06 | 7.12E-05 | 0.00E+00 | 2.73E-05 | 0.74 | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| 2020 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 6.94E-06 | 2.60E-05 | 5.05E-05 | 1.29E-02 | 1.45E-07 | 1.70E-06 | 0.00E+00 | 6.27E-07 | 0.51 | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| 2021 | Annual | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | 7.48E+01 | 2.92E-03 | 1.22E-02 | 1.45E-02 | 5.93E+00 | 6.67E-05 | 4.98E-04 | 0.00E+00 | 2.63E-04 | 0.57 | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| 2021 | Annual | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | 5.40E+01 | 3.06E-03 | 1.23E-02 | 1.41E-02 | 6.30E+00 | 6.18E-05 | 5.14E-04 | 0.00E+00 | 2.76E-04 | 0.57 | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| 2021 | Annual | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | 3.33E+01 | 1.58E-03 | 6.06E-03 | 1.00E-02 | 2.86E+00 | 3.22E-05 | 3.43E-04 | 0.00E+00 | 1.42E-04 | 0.61 | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| 2021 | Annual | Forklift | D | 175 | 166 | Construction and Mining Equipment | 1.37E+01 | 5.05E-04 | 4.95E-03 | 2.83E-03 | 8.56E-01 | 9.63E-06 | 1.46E-04 | 0.00E+00 | 4.55E-05 | 0.60 | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| 2021 | Annual | Loader | D | 500 | 350 | Construction and Mining Equipment | 2.98E+01 | 1.85E-03 | 7.31E-03 | 1.07E-02 | 3.53E+00 | 3.46E-05 | 3.88E-04 | 0.00E+00 | 1.66E-04 | 0.54 | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| 2021 | Annual | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | 3.85E+02 | 6.54E-03 | 6.53E-02 | 4.37E-02 | 9.96E+00 | 1.17E-04 | 2.07E-03 | 0.00E+00 | 5.90E-04 | 0.55 | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| 2021 | Annual | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | 2.92E+01 | 2.44E-03 | 9.39E-03 | 1.63E-02 | 3.78E+00 | 3.71E-05 | 6.04E-04 | 0.00E+00 | 2.20E-04 | 0.64 | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| 2021 | Annual | Street Sweeper | D | 120 | 88 | Industrial Equipment | 3.74E+01 | 8.76E-04 | 9.13E-03 | 5.93E-03 | 1.40E+00 | 1.65E-05 | 2.71E-04 | 0.00E+00 | 7.90E-05 | 0.68 | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| 2021 | Annual | Water Truck | D | 250 | 233 | Construction and Mining Equipment | 1.69E+01 | 7.42E-04 | 2.95E-03 | 3.70E-03 | 1.41E+00 | 1.58E-05 | 1.28E-04 | 0.00E+00 | 6.70E-05 | 0.57 | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| 2021 | Annual | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | 1.31E+01 | 3.02E-03 | 1.01E-02 | 3.13E-02 | 4.87E+00 | 4.78E-05 | 7.48E-04 | 0.00E+00 | 2.73E-04 | 0.59 | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| 2021 | Annual | Crane Barge | D | 750 | 668 | Dredging | 1.70E-01 | 8.14E-06 | 5.39E-05 | 3.19E-05 | 3.05E-02 | 3.00E-07 | 9.84E-07 | 0.00E+00 | 7.35E-07 | 0.43 | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| 2021 | Annual | Hoist | D | 250 | 213 | Dredging | 2.31E+00 | 8.04E-05 | 3.14E-04 | 5.40E-04 | 1.57E-01 | 1.77E-06 | 1.83E-05 | 0.00E+00 | 7.25E-06 | 0.51 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| 2021 | Annual | Pump (Dredging) | D | 500 | 386 | Dredging | 6.37E-01 | 3.98E-05 | 2.04E-04 | 3.33E-04 | 1.14E-01 | 1.12E-06 | 1.10E-05 | 0.00E+00 | 3.59E-06 | 0.74 | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |
| 2021 | Annual | Generator (Dredging) | D | 500 | 401 | Dredging | 2.98E+00 | 2.87E-04 | 1.07E-03 | 1.71E-03 | 5.54E-01 | 5.44E-06 | 6.28E-05 | 0.00E+00 | 2.59E-05 | 0.74 | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| 2021 | Annual | Dump Barge | D | 250 | 218 | Dredging | 1.85E-01 | 6.58E-06 | 2.57E-05 | 4.42E-05 | 1.29E-02 | 1.45E-07 | 1.50E-06 | 0.00E+00 | 5.94E-07 | 0.51 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |

**Project Construction**

# OFFROAD EQUIPMENT EMISSION REDUCTIONS BY TIER

**TABLE II-C**
**PERCENTAGE REDUCTION**
**FROM UNCONTROLLED TO TIERS 1, 2, 3 & 4**

| Model Year | Engine Size (hp) | | Uncontrolled to Tier 1 | | | Uncontrolled to Tier 2 | | | Uncontrolled to Tier 3 | | | Uncontrolled to Tier 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NOx | ROG | PM | NOx | ROG | PM | NOx | ROG | PM | NOx | ROG | PM |
| 1988+ | 75 - 99 | | 15% | 0% | 0% | 35% | 76% | 40% | 59% | 85% | 40% | 69% | 88% | 97% |
| 1987+ | 100 - 174 | | 9% | 0% | 0% | 39% | 70% | 20% | 63% | 82% | 20% | 67% | 83% | 95% |
| 1987+ | 175 - 299 | | 9% | 0% | 0% | 39% | 70% | 45% | 63% | 82% | 45% | 80% | 83% | 95% |
| 1987+ | 300 - 600 | | 9% | 0% | 0% | 40% | 71% | 45% | 63% | 82% | 45% | 80% | 83% | 95% |

**TABLE II-C**
**PERCENTAGE REMAINING**
**FROM UNCONTROLLED TO TIERS 1, 2, 3 & 4 with Oxidation Catalyst**

| Model Year | Engine Size (hp) | | Uncontrolled to Tier 1 | | | Uncontrolled to Tier 2 | | | Uncontrolled to Tier 3 | | | Uncontrolled to Tier 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NOx | ROG | PM | NOx | ROG | PM | NOx | ROG | PM | NOx | ROG | PM |
| 1988+ | 0 | 99 | 34% | 100% | 100% | 26% | 24% | 60% | 16% | 15% | 60% | 12% | 12% | 3% |
| 1987+ | 100 | 174 | 36% | 100% | 100% | 25% | 30% | 80% | 15% | 18% | 80% | 13% | 17% | 5% |
| 1987+ | 175 | 299 | 36% | 100% | 100% | 25% | 30% | 55% | 15% | 18% | 55% | 8% | 17% | 5% |
| 1987+ | 300 | 600 | 36% | 100% | 100% | 24% | 29% | 55% | 15% | 18% | 55% | 8% | 17% | 5% |

**Source: Carl Moyer Table B-12 > > >** http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part4.pdf

**Source: ARB Table 1 > >** http://www.arb.ca.gov/msprog/ordiesel/documents/Off-Road Diesel Stds.xls

Nox Reduction

40%

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,075,410 | | | | |
| VMT/1000 | 205,698 | | | | |
| Trips | 38,142,600 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.93 | 15,860 | 7,193,977 | 0.03497 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 11.31 | 22,620 | 10,260,262 | | 0.26900 |
| | ------- | | | | |
| Total Ex | 19.24 | 38,480 | 17,454,239 | | |
| | | | | | |
| Diurnal | 3.67 | 7,340 | 3,329,369 | 0.01619 | |
| Hot Soak | 6.44 | 12,880 | 5,842,271 | 0.02840 | |
| Running | 14.84 | 29,680 | 13,462,625 | 0.06545 | |
| Resting | 2.71 | 5,420 | 2,458,471 | 0.01195 | |
| | ------- | | | | |
| Total | 46.91 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 338.41 | 676,820 | 307,000,476 | 1.49248 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 143.45 | 286,900 | 130,135,688 | | 3.41182 |
| | ------- | | | | |
| Total Ex | 481.86 | 963,720 | 437,136,164 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 28.69 | 57,380 | 26,027,138 | 0.12653 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 9.57 | 19,140 | 8,681,760 | | 0.22761 |
| | ------- | | | | |
| Total Ex | 38.26 | 76,520 | 34,708,898 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 89.11 | 178,220 | 80,839,255 | 392.99971 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.01 | 6,020 | 2,730,627 | | 71.58995 |
| | ------- | | | | |
| Total Ex | 92.12 | 184,240 | 83,569,882 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.81 | 5,620 | 2,549,190 | 0.01239 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.26 | 520 | 235,868 | | 0.00618 |
| | ------- | | | | |
| Total Ex | 3.07 | 6,140 | 2,785,058 | | |
| | | | | | |
| TireWear | 1.81 | 3,620 | 1,642,005 | 0.00798 | |
| BrakeWr | 2.84 | 5,680 | 2,576,405 | 0.01253 | |
| | ------- | | | | |
| Total | 7.73 | 15,460 | 7,012,540 | | |
| Lead | 0 | | | | |
| SOx | 0.89 | 1,780 | 807,395 | 0.00393 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9515.69 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,157,280 | | | | |
| VMT/1000 | 207,520 | | | | |
| Trips | 38,595,500 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.27 | 14,540 | 6,595,235 | 0.03178 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 10.3 | 20,600 | 9,344,006 | | 0.24210 |
| ------- | | | | | |
| Total Ex | 17.57 | 35,140 | 15,939,240 | | |
| | | | | | |
| Diurnal | 3.53 | 7,060 | 3,202,363 | 0.01543 | |
| Hot Soak | 6.4 | 12,800 | 5,805,984 | 0.02798 | |
| Running | 14.38 | 28,760 | 13,045,320 | 0.06286 | |
| Resting | 2.68 | 5,360 | 2,431,256 | 0.01172 | |
| ------- | | | | | |
| Total | 44.56 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 316.52 | 633,040 | 287,142,196 | 1.38368 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 133.15 | 266,300 | 120,791,683 | | 3.12968 |
| ------- | | | | | |
| Total Ex | 449.68 | 899,360 | 407,942,951 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 26.45 | 52,900 | 23,995,043 | 0.11563 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 8.76 | 17,520 | 7,946,941 | | 0.20590 |
| ------- | | | | | |
| Total Ex | 35.21 | 70,420 | 31,941,984 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 89.72 | 179,440 | 81,392,638 | 392.21587 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.04 | 6,080 | 2,757,842 | | 71.45502 |
| ------- | | | | | |
| Total Ex | 92.76 | 185,520 | 84,150,481 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.86 | 5,720 | 2,594,549 | 0.01250 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.27 | 540 | 244,940 | | 0.00635 |
| ------- | | | | | |
| Total Ex | 3.13 | 6,260 | 2,839,489 | | |
| | | | | | |
| TireWear | 1.83 | 3,660 | 1,660,149 | 0.00800 | |
| BrakeWr | 2.87 | 5,740 | 2,603,621 | 0.01255 | |
| ------- | | | | | |
| Total | 7.83 | 15,660 | 7,103,259 | | |
| Lead | 0 | | | | |
| SOx | 0.9 | 1,800 | 816,467 | 0.00393 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9575.19 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2016 -- All model years in the range 1972 to 2016 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,220,690 | | | | |
| VMT/1000 | 208,546 | | | | |
| Trips | 38,927,800 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.77 | 13,540 | 6,141,642 | 0.02945 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 9.38 | 18,760 | 8,509,395 | | 0.21859 |
| | ------- | | | | |
| Total Ex | 16.15 | 32,300 | 14,651,038 | | |
| | | | | | |
| Diurnal | 3.39 | 6,780 | 3,075,357 | 0.01482 | |
| Hot Soak | 6.33 | 12,660 | 5,742,481 | 0.02767 | |
| Running | 13.94 | 27,880 | 12,646,159 | 0.06094 | |
| Resting | 2.65 | 5,300 | 2,404,040 | 0.01158 | |
| | ------- | | | | |
| Total | 42.47 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 297.52 | 595,040 | 269,905,681 | 1.29423 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 123.39 | 246,780 | 111,937,557 | | 2.87552 |
| | ------- | | | | |
| Total Ex | 420.91 | 841,820 | 381,843,238 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 24.48 | 48,960 | 22,207,889 | 0.10649 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.99 | 15,980 | 7,248,408 | | 0.18620 |
| | ------- | | | | |
| Total Ex | 32.47 | 64,940 | 29,456,297 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 90.45 | 180,900 | 82,054,883 | 393.46179 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.06 | 6,120 | 2,775,986 | | 71.31115 |
| | ------- | | | | |
| Total Ex | 93.51 | 187,020 | 84,830,869 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.94 | 5,880 | 2,667,124 | 0.01279 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.28 | 560 | 254,012 | | 0.00653 |
| | ------- | | | | |
| Total Ex | 3.22 | 6,440 | 2,921,136 | | |
| | | | | | |
| TireWear | 1.84 | 3,680 | 1,669,220 | 0.00800 | |
| BrakeWr | 2.88 | 5,760 | 2,612,693 | 0.01253 | |
| | ------- | | | | |
| Total | 7.94 | 15,880 | 7,203,049 | | |
| Lead | 0 | | | | |
| SOx | 0.9 | 1,800 | 816,467 | 0.00392 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9647.24 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2017 -- All model years in the range 1973 to 2017 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,284,290 | | | | |
| VMT/1000 | 209,938 | | | | |
| Trips | 39,265,500 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.26 | 12,520 | 5,678,978 | 0.02705 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 8.55 | 17,100 | 7,756,432 | | 0.19754 |
| | ------- | | | | |
| Total Ex | 14.81 | 29,620 | 13,435,410 | | |
| | | | | | |
| Diurnal | 3.27 | 6,540 | 2,966,495 | 0.01429 | |
| Hot Soak | 6.25 | 12,500 | 5,669,906 | 0.02732 | |
| Running | 13.52 | 27,040 | 12,265,141 | 0.05910 | |
| Resting | 2.6 | 5,200 | 2,358,681 | 0.01137 | |
| | ------- | | | | |
| Total | 40.45 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 278.67 | 557,340 | 252,805,244 | 1.20419 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 114.19 | 228,380 | 103,591,455 | | 2.63823 |
| | ------- | | | | |
| Total Ex | 392.86 | 785,720 | 356,396,699 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 22.65 | 45,300 | 20,547,740 | 0.09788 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.26 | 14,520 | 6,586,163 | | 0.16773 |
| | ------- | | | | |
| Total Ex | 29.91 | 59,820 | 27,133,903 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 90.91 | 181,820 | 82,472,188 | 392.84069 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.08 | 6,160 | 2,794,130 | | 71.15992 |
| | ------- | | | | |
| Total Ex | 93.99 | 187,980 | 85,266,318 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.99 | 5,980 | 2,712,483 | 0.01292 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.28 | 560 | 254,012 | | 0.00647 |
| | ------- | | | | |
| Total Ex | 3.27 | 6,540 | 2,966,495 | | |
| | | | | | |
| TireWear | 1.85 | 3,700 | 1,678,292 | 0.00799 | |
| BrakeWr | 2.9 | 5,800 | 2,630,837 | 0.01253 | |
| | ------- | | | | |
| Total | 8.02 | 16,040 | 7,275,624 | | |
| Lead | 0 | | | | |
| SOx | 0.91 | 1,820 | 825,538 | 0.00393 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9691.48 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2018 -- All model years in the range 1974 to 2018 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,347,850 | | | | |
| VMT/1000 | 211,564 | | | | |
| Trips | 39,607,000 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.8 | 11,600 | 5,261,673 | 0.02487 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.8 | 15,600 | 7,076,043 | | 0.17866 |
| ------- | | | | | |
| Total Ex | 13.6 | 27,200 | 12,337,716 | | |
| | | | | | |
| Diurnal | 3.14 | 6,280 | 2,848,561 | 0.01373 | |
| Hot Soak | 6.13 | 12,260 | 5,561,044 | 0.02680 | |
| Running | 13.13 | 26,260 | 11,911,339 | 0.05740 | |
| Resting | 2.55 | 5,100 | 2,313,322 | 0.01115 | |
| ------- | | | | | |
| Total | 38.54 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 261.22 | 522,440 | 236,974,866 | 1.12011 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 105.54 | 211,080 | 95,744,305 | | 2.41736 |
| ------- | | | | | |
| Total Ex | 366.76 | 733,520 | 332,719,171 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 21 | 42,000 | 19,050,885 | 0.09005 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 6.59 | 13,180 | 5,978,349 | | 0.15094 |
| ------- | | | | | |
| Total Ex | 27.59 | 55,180 | 25,029,234 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 91.44 | 182,880 | 82,952,996 | 392.09410 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.1 | 6,200 | 2,812,274 | | 71.00446 |
| ------- | | | | | |
| Total Ex | 94.54 | 189,080 | 85,765,270 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.02 | 6,040 | 2,739,699 | 0.01295 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.29 | 580 | 263,084 | | 0.00664 |
| ------- | | | | | |
| Total Ex | 3.31 | 6,620 | 3,002,782 | | |
| | | | | | |
| TireWear | 1.87 | 3,740 | 1,696,436 | 0.00802 | |
| BrakeWr | 2.93 | 5,860 | 2,658,052 | 0.01256 | |
| ------- | | | | | |
| Total | 8.1 | 16,200 | 7,348,199 | | |
| Lead | 0 | | | | |
| SOx | 0.91 | 1,820 | 825,538 | 0.00390 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9742.85 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2019 -- All model years in the range 1975 to 2019 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,411,000 | | | | |
| VMT/1000 | 213,354 | | | | |
| Trips | 39,951,600 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.39 | 10,780 | 4,889,727 | 0.02292 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.11 | 14,220 | 6,450,085 | | 0.16145 |
| | ------- | | | | |
| Total Ex | 12.5 | 25,000 | 11,339,813 | | |
| | | | | | |
| Diurnal | 3.02 | 6,040 | 2,739,699 | 0.01320 | |
| Hot Soak | 6 | 12,000 | 5,443,110 | 0.02623 | |
| Running | 12.74 | 25,480 | 11,557,537 | 0.05569 | |
| Resting | 2.49 | 4,980 | 2,258,891 | 0.01089 | |
| | ------- | | | | |
| Total | 36.76 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 245.27 | 490,540 | 222,505,265 | 1.04289 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 97.5 | 195,000 | 88,450,538 | | 2.21394 |
| | ------- | | | | |
| Total Ex | 342.77 | 685,540 | 310,955,802 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 19.52 | 39,040 | 17,708,251 | 0.08300 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 5.97 | 11,940 | 5,415,894 | | 0.13556 |
| | ------- | | | | |
| Total Ex | 25.49 | 50,980 | 23,124,146 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 92.05 | 184,100 | 83,506,379 | 391.39824 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.12 | 6,240 | 2,830,417 | | 70.84615 |
| | ------- | | | | |
| Total Ex | 95.17 | 190,340 | 86,336,796 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.06 | 6,120 | 2,775,986 | 0.01301 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.29 | 580 | 263,084 | | 0.00659 |
| | ------- | | | | |
| Total Ex | 3.35 | 6,700 | 3,039,070 | | |
| | | | | | |
| TireWear | 1.88 | 3,760 | 1,705,508 | 0.00799 | |
| BrakeWr | 2.95 | 5,900 | 2,676,196 | 0.01254 | |
| | ------- | | | | |
| Total | 8.18 | 16,360 | 7,420,773 | | |
| Lead | 0 | | | | |
| SOx | 0.92 | 1,840 | 834,610 | 0.00391 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9803.49 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,473,030 | | | | |
| VMT/1000 | 215,241 | | | | |
| Trips | 40,296,400 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 4.99 | 9,980 | 4,526,853 | 0.02103 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 6.49 | 12,980 | 5,887,631 | | 0.14611 |
| | ------- | | | | |
| Total Ex | 11.48 | 22,960 | 10,414,484 | | |
| | | | | | |
| Diurnal | 2.89 | 5,780 | 2,621,765 | 0.01263 | |
| Hot Soak | 5.84 | 11,680 | 5,297,960 | 0.02553 | |
| Running | 12.34 | 24,680 | 11,194,663 | 0.05394 | |
| Resting | 2.42 | 4,840 | 2,195,388 | 0.01058 | |
| | ------- | | | | |
| Total | 34.97 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 230.3 | 460,600 | 208,924,706 | 0.97065 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 89.96 | 179,920 | 81,610,363 | | 2.02525 |
| | ------- | | | | |
| Total Ex | 320.26 | 640,520 | 290,535,068 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 18.15 | 36,300 | 16,465,408 | 0.07650 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 5.4 | 10,800 | 4,898,799 | | 0.12157 |
| | ------- | | | | |
| Total Ex | 23.55 | 47,100 | 21,364,207 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 92.72 | 185,440 | 84,114,193 | 390.79076 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.14 | 6,280 | 2,848,561 | | 70.69021 |
| | ------- | | | | |
| Total Ex | 95.86 | 191,720 | 86,962,754 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.09 | 6,180 | 2,803,202 | 0.01302 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.29 | 580 | 263,084 | | 0.00653 |
| | ------- | | | | |
| Total Ex | 3.38 | 6,760 | 3,066,285 | | |
| | | | | | |
| TireWear | 1.9 | 3,800 | 1,723,652 | 0.00801 | |
| BrakeWr | 2.98 | 5,960 | 2,703,411 | 0.01256 | |
| | ------- | | | | |
| Total | 8.26 | 16,520 | 7,493,348 | | |
| Lead | 0 | | | | |
| SOx | 0.93 | 1,860 | 843,682 | 0.00392 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9869.77 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS
## EMPLOYEE COMMUTE

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2021 -- All model years in the range 1977 to 2021 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,506,540 | | | | |
| VMT/1000 | 215,640 | | | | |
| Trips | 40,460,100 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 4.68 | 9,360 | 4,245,626 | 0.01969 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 5.92 | 11,840 | 5,370,535 | | 0.13274 |
| | ------- | | | | |
| Total Ex | 10.6 | 21,200 | 9,616,161 | | |
| | | | | | |
| Diurnal | 2.77 | 5,540 | 2,512,902 | 0.01211 | |
| Hot Soak | 5.67 | 11,340 | 5,143,739 | 0.02479 | |
| Running | 11.93 | 23,860 | 10,822,717 | 0.05215 | |
| Resting | 2.34 | 4,680 | 2,122,813 | 0.01023 | |
| | ------- | | | | |
| Total | 33.32 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 217.96 | 435,920 | 197,730,043 | 0.91695 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 83.03 | 166,060 | 75,323,571 | | 1.86168 |
| | ------- | | | | |
| Total Ex | 300.99 | 601,980 | 273,053,613 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 16.94 | 33,880 | 15,367,714 | 0.07127 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 4.9 | 9,800 | 4,445,207 | | 0.10987 |
| | ------- | | | | |
| Total Ex | 21.84 | 43,680 | 19,812,920 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 93.25 | 186,500 | 84,595,001 | 392.29735 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.15 | 6,300 | 2,857,633 | | 70.62842 |
| | ------- | | | | |
| Total Ex | 96.4 | 192,800 | 87,452,634 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.15 | 6,300 | 2,857,633 | 0.01325 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.3 | 600 | 272,156 | | 0.00673 |
| | ------- | | | | |
| Total Ex | 3.44 | 6,880 | 3,120,716 | | |
| | | | | | |
| TireWear | 1.9 | 3,800 | 1,723,652 | 0.00799 | |
| BrakeWr | 2.98 | 5,960 | 2,703,411 | 0.01254 | |
| | ------- | | | | |
| Total | 8.33 | 16,660 | 7,556,851 | | |
| Lead | 0 | | | | |
| SOx | 0.93 | 1,860 | 843,682 | 0.00391 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9921.23 | | | | |
| Diesel | 0 | | | | |

**Project Construction**

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2014 -- All model years in the range 2007 to 2014 selected
Season : Annual
Area : Los Angeles
**********

Year: 2014 -- Model Years 2007 to 2014
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.134 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

**Project Construction**

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2015 -- All model years in the range 2007 to 2015 selected
Season : Annual
Area : Los Angeles
**********

Year: 2015 -- Model Years 2007 to 2015
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.134 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

**Project Construction**

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2016 -- All model years in the range 2007 to 2016 selected
Season : Annual
Area : Los Angeles
**********

Year: 2016 -- Model Years 2007 to 2016
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.134 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

**Project Construction**

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2017 -- All model years in the range 2007 to 2017 selected
Season : Annual
Area : Los Angeles
**********

Year: 2017 -- Model Years 2007 to 2017
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.133 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

**Project Construction**

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2018 -- All model years in the range 2007 to 2018 selected
Season : Annual
Area : Los Angeles
**********

Year: 2018 -- Model Years 2007 to 2018
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.133 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

**Project Construction**

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2019 -- All model years in the range 2007 to 2019 selected
Season : Annual
Area : Los Angeles
**********

Year: 2019 -- Model Years 2007 to 2019
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.134 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

**Project Construction**

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2020 -- All model years in the range 2007 to 2020 selected
Season : Annual
Area : Los Angeles
**********

Year: 2020 -- Model Years 2007 to 2020
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.133 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

**Project Construction**

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 17:29:12
Scen Year: 2021 -- All model years in the range 2007 to 2021 selected
Season : Annual
Area : Los Angeles
**********

Year: 2021 -- Model Years 2007 to 2021
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles

Table 1: Running Exhaust Emissions (grams/mile; gram

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 7.652 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 41.429 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 123.519 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.133 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.11 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2014 -- Model Years 1970 to 2014 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 10.302 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 45.288 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 116.253 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.133 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 1.135 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2015 -- Model Years 1971 to 2015 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 9.875 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 44.682 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 117.427 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.137 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.995 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2016 -- All model years in the range 1972 to 2016 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2016 -- Model Years 1972 to 2016 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 9.518 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 44.171 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 118.404 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.136 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.873 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2017 -- All model years in the range 1973 to 2017 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2017 -- Model Years 1973 to 2017 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 9.207 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 43.725 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 119.252 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.764 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2018 -- All model years in the range 1974 to 2018 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2018 -- Model Years 1974 to 2018 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.947 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 43.349 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 119.963 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.669 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2019 -- All model years in the range 1975 to 2019 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2019 -- Model Years 1975 to 2019 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.727 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 43.027 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 120.566 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.585 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2020 -- Model Years 1976 to 2020 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.541 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 42.753 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 121.076 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.512 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS IDLING- UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2021 -- All model years in the range 1977 to 2021 selected
Season : Annual
Area : South Coast AQMD
**********
Year: 2021 -- Model Years 1977 to 2021 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.384 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 42.52 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 121.509 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.134 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.447 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 15:54:45
Scen Year: 2014 -- All model years in the range 2007 to 2014 selected
Season : Annual
Area : Los Angeles County Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | HHDT-DSL | | | | |
| Vehicles | 11,643 | | | | |
| VMT/1000 | 3,694 | | | | |
| Trips | 58,920 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.16 | 2,320 | 1,052,335 | 0.28488 | |
| Idle Exh | 0.17 | 340 | 154,221 | | 2.61747 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 1.33 | 2,660 | 1,206,556 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 1.33 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 5.71 | 11,420 | 5,180,026 | 1.40228 | |
| Idle Exh | 0.9 | 1,800 | 816,467 | | 13.85720 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 6.61 | 13,220 | 5,996,493 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 13.78 | 27,560 | 12,501,009 | 3.38414 | |
| Idle Exh | 2.67 | 5,340 | 2,422,184 | | 41.10971 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 16.46 | 32,920 | 14,932,265 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 7.62 | 15,240 | 6,912,750 | 1,871.34534 | |
| Idle Exh | 0.14 | 280 | 127,006 | | 2,155.56517 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 7.77 | 15,540 | 7,048,827 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.39 | 780 | 353,802 | 0.09578 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 0.4 | 800 | 362,874 | | |
| | | | | | |
| TireWear | 0.15 | 300 | 136,078 | 0.03684 | |
| BrakeWr | 0.11 | 220 | 99,790 | 0.02701 | |
| | ------- | | | | |
| Total | 0.66 | 1,320 | 598,742 | | |
| Lead | 0 | | | | |
| SOx | 0.07 | 140 | 63,503 | 0.01719 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 699.09 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2010/10/14 15:54:45

Scen Year: 2015 -- All model years in the range 2007 to 2015 selected

Season : Annual

Area : Los Angeles County Average

I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)

Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | HHDT-DSL | | | | |
| Vehicles | 13722 | | | | |
| VMT/1000 | 4277 | | | | |
| Trips | 69440 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.34 | 2,680 | 1,215,628 | 0.28422 | |
| Idle Exh | 0.2 | 400 | 181,437 | | 2.61286 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 1.53 | 3,060 | 1,387,993 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 1.53 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 6.59 | 13,180 | 5,978,349 | 1.39779 | |
| Idle Exh | 1.06 | 2,120 | 961,616 | | 13.84816 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 7.64 | 15,280 | 6,930,893 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 15.14 | 30,280 | 13,734,781 | 3.21131 | |
| Idle Exh | 3.15 | 6,300 | 2,857,633 | | 41.15255 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 18.29 | 36,580 | 16,592,414 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 8.83 | 17,660 | 8,010,444 | 1,872.91175 | |
| Idle Exh | 0.17 | 340 | 154,221 | | 2,220.93102 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 9 | 18,000 | 8,164,665 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.47 | 940 | 426,377 | 0.09969 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 0.47 | 940 | 426,377 | | |
| | | | | | |
| TireWear | 0.17 | 340 | 154,221 | 0.03606 | |
| BrakeWr | 0.13 | 260 | 117,934 | 0.02757 | |
| | ------- | | | | |
| Total | 0.77 | 1,540 | 698,532 | | |
| Lead | 0 | | | | |
| SOx | 0.09 | 180 | 81,647 | 0.01909 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 809.61 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2010/10/14 15:54:45

Scen Year: 2016 -- All model years in the range 2007 to 2016 selected

Season : Annual

Area : Los Angeles County Average

I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)

Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 15484 | | | | |
| VMT/1000 | 4733 | | | | |
| Trips | 78359 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.48 | 2,960 | 1,342,634 | 0.28368 | |
| Idle Exh | 0.22 | 440 | 199,581 | | 2.54700 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 1.7 | 3,400 | 1,542,215 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 1.7 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 7.39 | 14,780 | 6,704,097 | 1.41646 | |
| Idle Exh | 1.19 | 2,380 | 1,079,550 | | 13.77698 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 8.58 | 17,160 | 7,783,647 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 16.24 | 32,480 | 14,732,684 | 3.11276 | |
| Idle Exh | 3.56 | 7,120 | 3,229,579 | | 41.21516 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 19.8 | 39,600 | 17,962,263 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 9.76 | 19,520 | 8,854,126 | 1,870.72166 | |
| Idle Exh | 0.19 | 380 | 172,365 | | 2,199.68542 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 9.95 | 19,900 | 9,026,491 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.55 | 1,100 | 498,952 | 0.10542 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 0.55 | 1,100 | 498,952 | | |
| | | | | | |
| TireWear | 0.19 | 380 | 172,365 | 0.03642 | |
| BrakeWr | 0.15 | 300 | 136,078 | 0.02875 | |
| ------- | | | | | |
| Total | 0.89 | 1,780 | 807,395 | | |
| Lead | 0 | | | | |
| SOx | 0.09 | 180 | 81,647 | 0.01725 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 895.37 | | | | |

## Project Construction

# EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 15:54:45
Scen Year: 2017 -- All model years in the range 2007 to 2017 selected
Season : Annual
Area : Los Angeles County Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | HHDT-DSL | | | | |
| Vehicles | 17181 | | | | |
| VMT/1000 | 5134 | | | | |
| Trips | 86945 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.61 | 3,220 | 1,460,568 | 0.28449 | |
| Idle Exh | 0.24 | 480 | 217,724 | | 2.50416 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 1.85 | 3,700 | 1,678,292 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 1.85 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 8.05 | 16,100 | 7,302,839 | 1.42245 | |
| Idle Exh | 1.32 | 2,640 | 1,197,484 | | 13.77289 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 9.38 | 18,760 | 8,509,395 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 17.29 | 34,580 | 15,685,229 | 3.05517 | |
| Idle Exh | 3.95 | 7,900 | 3,583,381 | | 41.21434 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 21.24 | 42,480 | 19,268,609 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 10.59 | 21,180 | 9,607,089 | 1,871.26785 | |
| Idle Exh | 0.21 | 420 | 190,509 | | 2,191.14210 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 10.8 | 21,600 | 9,797,598 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.61 | 1,220 | 553,383 | 0.10779 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 0.61 | 1,220 | 553,383 | | |
| | | | | | |
| TireWear | 0.2 | 400 | 181,437 | 0.03534 | |
| BrakeWr | 0.16 | 320 | 145,150 | 0.02827 | |
| | ------- | | | | |
| Total | 0.98 | 1,960 | 889,041 | | |
| Lead | 0 | | | | |
| SOx | 0.1 | 200 | 90,719 | 0.01767 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 971.76 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 15:54:45
Scen Year: 2018 -- All model years in the range 2007 to 2018 selected
Season : Annual
Area : Los Angeles County Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | HHDT-DSL | | | | |
| Vehicles | 18809 | | | | |
| VMT/1000 | 5484 | | | | |
| Trips | 95182 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.72 | 3,440 | 1,560,358 | 0.28453 | |
| Idle Exh | 0.27 | 540 | 244,940 | | 2.57339 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 1.99 | 3,980 | 1,805,298 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 1.99 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 8.62 | 17,240 | 7,819,935 | 1.42595 | |
| Idle Exh | 1.45 | 2,900 | 1,315,418 | | 13.82003 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 10.07 | 20,140 | 9,135,353 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 18.21 | 36,420 | 16,519,839 | 3.01237 | |
| Idle Exh | 4.32 | 8,640 | 3,919,039 | | 41.17416 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 22.53 | 45,060 | 20,438,878 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 11.31 | 22,620 | 10,260,262 | 1,870.94499 | |
| Idle Exh | 0.23 | 460 | 208,653 | | 2,192.14295 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 11.54 | 23,080 | 10,468,915 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.67 | 1,340 | 607,814 | 0.11083 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 0.67 | 1,340 | 607,814 | | |
| | | | | | |
| TireWear | 0.22 | 440 | 199,581 | 0.03639 | |
| BrakeWr | 0.17 | 340 | 154,221 | 0.02812 | |
| | ------- | | | | |
| Total | 1.06 | 2,120 | 961,616 | | |
| Lead | 0 | | | | |
| SOx | 0.11 | 220 | 99,790 | 0.01820 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 1038.5 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2010/10/14 15:54:45

Scen Year: 2019 -- All model years in the range 2007 to 2019 selected

Season : Annual

Area : Los Angeles County Average

I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)

Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 20373 | | | | |
| VMT/1000 | 5788 | | | | |
| Trips | 103100 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.82 | 3,640 | 1,651,077 | 0.28526 | |
| Idle Exh | 0.29 | 580 | 263,084 | | 2.55173 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 2.11 | 4,220 | 1,914,160 | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 2.11 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 9.11 | 18,220 | 8,264,455 | 1.42786 | |
| Idle Exh | 1.57 | 3,140 | 1,424,280 | | 13.81455 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 10.68 | 21,360 | 9,688,736 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 18.99 | 37,980 | 17,227,443 | 2.97641 | |
| Idle Exh | 4.68 | 9,360 | 4,245,626 | | 41.17969 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 23.67 | 47,340 | 21,473,069 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 11.93 | 23,860 | 10,822,717 | 1,869.85436 | |
| Idle Exh | 0.25 | 500 | 226,796 | | 2,199.76964 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 12.19 | 24,380 | 11,058,585 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.72 | 1,440 | 653,173 | 0.11285 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 0.72 | 1,440 | 653,173 | | |
| TireWear | 0.23 | 460 | 208,653 | 0.03605 | |
| BrakeWr | 0.18 | 360 | 163,293 | 0.02821 | |
| ------- | | | | | |
| Total | 1.13 | 2,260 | 1,025,119 | | |
| Lead | 0 | | | | |
| SOx | 0.12 | 240 | 108,862 | 0.01881 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 1096.69 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2010/10/14 15:54:45

Scen Year: 2020 -- All model years in the range 2007 to 2020 selected

Season : Annual

Area : Los Angeles County Average

I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)

Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 21857 | | | | |
| VMT/1000 | 6047 | | | | |
| Trips | 110605 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.9 | 3,800 | 1,723,652 | 0.28504 | |
| Idle Exh | 0.31 | 620 | 281,227 | | 2.54263 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 2.21 | 4,420 | 2,004,879 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | --- | | | | |
| Total | 2.21 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 9.5 | 19,000 | 8,618,258 | 1.42521 | |
| Idle Exh | 1.68 | 3,360 | 1,524,071 | | 13.77940 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 11.18 | 22,360 | 10,142,328 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 19.62 | 39,240 | 17,798,970 | 2.94344 | |
| Idle Exh | 5.02 | 10,040 | 4,554,069 | | 41.17417 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 24.65 | 49,300 | 22,362,110 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 12.47 | 24,940 | 11,312,597 | 1,870.77839 | |
| Idle Exh | 0.27 | 540 | 244,940 | | 2,214.54681 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 12.74 | 25,480 | 11,557,537 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.77 | 1,540 | 698,532 | 0.11552 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 0.77 | 1,540 | 698,532 | | |
| | | | | | |
| TireWear | 0.24 | 480 | 217,724 | 0.03601 | |
| BrakeWr | 0.19 | 380 | 172,365 | 0.02850 | |
| | --- | | | | |
| Total | 1.2 | 2,400 | 1,088,622 | | |
| Lead | 0 | | | | |
| SOx | 0.12 | 240 | 108,862 | 0.01800 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 1146.46 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - MITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/14 15:54:45
Scen Year: 2021 -- All model years in the range 2007 to 2021 selected
Season : Annual
Area : Los Angeles County Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | HHDT-DSL | | | | |
| Vehicles | 23326 | | | | |
| VMT/1000 | 6291 | | | | |
| Trips | 118043 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 1.98 | 3,960 | 1,796,226 | 0.28552 | |
| Idle Exh | 0.33 | 660 | 299,371 | | 2.53612 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 2.31 | 4,620 | 2,095,597 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 2.31 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 9.84 | 19,680 | 8,926,700 | 1.41896 | |
| Idle Exh | 1.8 | 3,600 | 1,632,933 | | 13.83337 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 11.63 | 23,260 | 10,550,562 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 20.23 | 40,460 | 18,352,353 | 2.91724 | |
| Idle Exh | 5.36 | 10,720 | 4,862,512 | | 41.19271 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 25.59 | 51,180 | 23,214,864 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 13 | 26,000 | 11,793,405 | 1,874.64711 | |
| Idle Exh | 0.29 | 580 | 263,084 | | 2,228.71030 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 13.28 | 26,560 | 12,047,417 | | |
| PM10 Emissions | | | | | |
| Run Exh | 0.8 | 1,600 | 725,748 | 0.11536 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 0.81 | 1,620 | 734,820 | | |
| | | | | | |
| TireWear | 0.25 | 500 | 226,796 | 0.03605 | |
| BrakeWr | 0.2 | 400 | 181,437 | 0.02884 | |
| | ------- | | | | |
| Total | 1.25 | 2,500 | 1,133,981 | | |
| Lead | 0 | | | | |
| SOx | 0.13 | 260 | 117,934 | 0.01875 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 1195.45 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | HHDT-DSL | | | | |
| Vehicles | 58,324 | | | | |
| VMT/1000 | 11,439 | | | | |
| Trips | 295,146 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 9.95 | 19,900 | 9,026,491 | 0.78910 | |
| Idle Exh | 1.12 | 2,240 | 1,016,047 | | 3.44252 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 11.07 | 22,140 | 10,042,538 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 11.07 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 40.32 | 80,640 | 36,577,699 | 3.19763 | |
| Idle Exh | 4.91 | 9,820 | 4,454,278 | | 15.09178 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 45.23 | 90,460 | 41,031,978 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 116.86 | 233,720 | 106,013,639 | 9.26774 | |
| Idle Exh | 12.61 | 25,220 | 11,439,603 | | 38.75913 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 129.47 | 258,940 | 117,453,242 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 23.23 | 46,460 | 21,073,908 | 1,842.28582 | |
| Idle Exh | 0.72 | 1,440 | 653,173 | | 2,213.05117 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 23.94 | 47,880 | 21,718,009 | | |
| PM10 Emissions | | | | | |
| Run Exh | 5.7 | 11,400 | 5,170,955 | 0.45205 | |
| Idle Exh | 0.12 | 240 | 108,862 | | 0.36884 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 5.82 | 11,640 | 5,279,817 | | |
| | | | | | |
| TireWear | 0.45 | 900 | 408,233 | 0.03569 | |
| BrakeWr | 0.36 | 720 | 326,587 | 0.02855 | |
| | ------- | | | | |
| Total | 6.63 | 13,260 | 6,014,637 | | |
| Lead | 0 | | | | |
| SOx | 0.23 | 460 | 208,653 | 0.01824 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2154.97 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 60,159 | | | | |
| VMT/1000 | 12,042 | | | | |
| Trips | 304,434 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 9.22 | 18,440 | 8,364,246 | 0.69459 | |
| Idle Exh | 1.1 | 2,200 | 997,904 | | 3.27790 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 10.32 | 20,640 | 9,362,149 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 10.32 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 38.14 | 76,280 | 34,600,036 | 2.87328 | |
| Idle Exh | 5 | 10,000 | 4,535,925 | | 14.89953 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 43.14 | 86,280 | 39,135,961 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 106.67 | 213,340 | 96,769,424 | 8.03599 | |
| Idle Exh | 13.14 | 26,280 | 11,920,411 | | 39.15598 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 119.81 | 239,620 | 108,689,835 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 24.45 | 48,900 | 22,180,673 | 1,841.94264 | |
| Idle Exh | 0.74 | 1,480 | 671,317 | | 2,205.13116 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 25.19 | 50,380 | 22,851,990 | | |
| PM10 Emissions | | | | | |
| Run Exh | 5.22 | 10,440 | 4,735,506 | 0.39325 | |
| Idle Exh | 0.11 | 220 | 99,790 | | 0.32779 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 5.33 | 10,660 | 4,835,296 | | |
| | | | | | |
| TireWear | 0.48 | 960 | 435,449 | 0.03616 | |
| BrakeWr | 0.37 | 740 | 335,658 | 0.02787 | |
| ------- | | | | | |
| Total | 6.18 | 12,360 | 5,606,403 | | |
| Lead | 0 | | | | |
| SOx | 0.24 | 480 | 217,724 | 0.01808 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2266.95 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2016 -- All model years in the range 1972 to 2016 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 61,237 | | | | |
| VMT/1000 | 12,456 | | | | |
| Trips | 309,889 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 8.51 | 17,020 | 7,720,144 | 0.61979 | |
| Idle Exh | 1.08 | 2,160 | 979,760 | | 3.16165 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 9.59 | 19,180 | 8,699,904 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 9.59 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 35.87 | 71,740 | 32,540,726 | 2.61245 | |
| Idle Exh | 5.03 | 10,060 | 4,563,141 | | 14.72508 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 40.9 | 81,800 | 37,103,867 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 96.67 | 193,340 | 87,697,574 | 7.04059 | |
| Idle Exh | 13.48 | 26,960 | 12,228,854 | | 39.46205 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 110.15 | 220,300 | 99,926,428 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 25.31 | 50,620 | 22,960,852 | 1,843.35680 | |
| Idle Exh | 0.75 | 1,500 | 680,389 | | 2,195.58858 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 26.06 | 52,120 | 23,641,241 | | |
| PM10 Emissions | | | | | |
| Run Exh | 4.75 | 9,500 | 4,309,129 | 0.34595 | |
| Idle Exh | 0.1 | 200 | 90,719 | | 0.29275 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 4.85 | 9,700 | 4,399,847 | | |
| | | | | | |
| TireWear | 0.49 | 980 | 444,521 | 0.03569 | |
| BrakeWr | 0.39 | 780 | 353,802 | 0.02840 | |
| ------- | | | | | |
| Total | 5.73 | 11,460 | 5,198,170 | | |
| Lead | 0 | | | | |
| SOx | 0.25 | 500 | 226,796 | 0.01821 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2345.42 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2017 -- All model years in the range 1973 to 2017 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 62,310 | | | | |
| VMT/1000 | 12,833 | | | | |
| Trips | 315,319 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.84 | 15,680 | 7,112,330 | 0.55422 | |
| Idle Exh | 1.07 | 2,140 | 970,688 | | 3.07843 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 8.9 | 17,800 | 8,073,947 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 8.9 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 33.77 | 67,540 | 30,635,637 | 2.38725 | |
| Idle Exh | 5.07 | 10,140 | 4,599,428 | | 14.58659 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 38.84 | 77,680 | 35,235,065 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 87.86 | 175,720 | 79,705,274 | 6.21096 | |
| Idle Exh | 13.82 | 27,640 | 12,537,297 | | 39.76068 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 101.68 | 203,360 | 92,242,571 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 26.07 | 52,140 | 23,650,313 | 1,842.92940 | |
| Idle Exh | 0.77 | 1,540 | 698,532 | | 2,215.31988 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 26.84 | 53,680 | 24,348,845 | | |
| PM10 Emissions | | | | | |
| Run Exh | 4.31 | 8,620 | 3,909,967 | 0.30468 | |
| Idle Exh | 0.09 | 180 | 81,647 | | 0.25893 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 4.4 | 8,800 | 3,991,614 | | |
| | | | | | |
| TireWear | 0.51 | 1,020 | 462,664 | 0.03605 | |
| BrakeWr | 0.4 | 800 | 362,874 | 0.02828 | |
| | ------- | | | | |
| Total | 5.31 | 10,620 | 4,817,152 | | |
| Lead | 0 | | | | |
| SOx | 0.26 | 520 | 235,868 | 0.01838 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2415.45 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2018 -- All model years in the range 1974 to 2018 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 63,391 | | | | |
| VMT/1000 | 13,176 | | | | |
| Trips | 320,790 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.24 | 14,480 | 6,568,019 | 0.49848 | |
| Idle Exh | 1.05 | 2,100 | 952,544 | | 2.96937 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 8.29 | 16,580 | 7,520,564 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 8.29 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 31.89 | 63,780 | 28,930,130 | 2.19567 | |
| Idle Exh | 5.11 | 10,220 | 4,635,715 | | 14.45093 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 37 | 74,000 | 33,565,845 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 80.18 | 160,360 | 72,738,093 | 5.52050 | |
| Idle Exh | 14.14 | 28,280 | 12,827,596 | | 39.98752 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 94.33 | 188,660 | 85,574,761 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 26.77 | 53,540 | 24,285,342 | 1,843.14985 | |
| Idle Exh | 0.78 | 1,560 | 707,604 | | 2,205.81782 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 27.55 | 55,100 | 24,992,947 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.93 | 7,860 | 3,565,237 | 0.27059 | |
| Idle Exh | 0.08 | 160 | 72,575 | | 0.22624 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 4 | 8,000 | 3,628,740 | | |
| | | | | | |
| TireWear | 0.52 | 1,040 | 471,736 | 0.03580 | |
| BrakeWr | 0.41 | 820 | 371,946 | 0.02823 | |
| ------- | | | | | |
| Total | 4.94 | 9,880 | 4,481,494 | | |
| Lead | 0 | | | | |
| SOx | 0.26 | 520 | 235,868 | 0.01790 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2479.14 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2019 -- All model years in the range 1975 to 2019 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 64,480 | | | | |
| VMT/1000 | 13,486 | | | | |
| Trips | 326,300 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.71 | 13,420 | 6,087,211 | 0.45137 | |
| Idle Exh | 1.05 | 2,100 | 952,544 | | 2.91923 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 7.75 | 15,500 | 7,030,684 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 7.75 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 30.2 | 60,400 | 27,396,987 | 2.03151 | |
| Idle Exh | 5.16 | 10,320 | 4,681,075 | | 14.34592 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 35.36 | 70,720 | 32,078,062 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 73.47 | 146,940 | 66,650,882 | 4.94223 | |
| Idle Exh | 14.46 | 28,920 | 13,117,895 | | 40.20195 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 87.93 | 175,860 | 79,768,777 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 27.39 | 54,780 | 24,847,797 | 1,842.48830 | |
| Idle Exh | 0.79 | 1,580 | 716,676 | | 2,196.37190 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 28.19 | 56,380 | 25,573,545 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.59 | 7,180 | 3,256,794 | 0.24149 | |
| Idle Exh | 0.07 | 140 | 63,503 | | 0.19462 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 3.66 | 7,320 | 3,320,297 | | |
| | | | | | |
| TireWear | 0.54 | 1,080 | 489,880 | 0.03633 | |
| BrakeWr | 0.42 | 840 | 381,018 | 0.02825 | |
| ------- | | | | | |
| Total | 4.61 | 9,220 | 4,182,123 | | |
| Lead | 0 | | | | |
| SOx | 0.27 | 540 | 244,940 | 0.01816 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2536.81 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 65,570 | | | | |
| VMT/1000 | 13,761 | | | | |
| Trips | 331,816 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.23 | 12,460 | 5,651,763 | 0.41071 | |
| Idle Exh | 1.04 | 2,080 | 943,472 | | 2.84336 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 7.28 | 14,560 | 6,604,307 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 7.28 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 28.7 | 57,400 | 26,036,210 | 1.89203 | |
| Idle Exh | 5.21 | 10,420 | 4,726,434 | | 14.24414 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 33.92 | 67,840 | 30,771,715 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 67.65 | 135,300 | 61,371,065 | 4.45978 | |
| Idle Exh | 14.76 | 29,520 | 13,390,051 | | 40.35384 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 82.41 | 164,820 | 74,761,116 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 27.95 | 55,900 | 25,355,821 | 1,842.58562 | |
| Idle Exh | 0.81 | 1,620 | 734,820 | | 2,214.54014 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 28.76 | 57,520 | 26,090,641 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.3 | 6,600 | 2,993,711 | 0.21755 | |
| Idle Exh | 0.06 | 120 | 54,431 | | 0.16404 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 3.36 | 6,720 | 3,048,142 | | |
| | | | | | |
| TireWear | 0.55 | 1,100 | 498,952 | 0.03626 | |
| BrakeWr | 0.43 | 860 | 390,090 | 0.02835 | |
| ------- | | | | | |
| Total | 4.33 | 8,660 | 3,928,111 | | |
| Lead | 0 | | | | |
| SOx | 0.27 | 540 | 244,940 | 0.01780 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2588.03 | | | | |

# Project Construction

## EMFAC2007 EMISSION FACTORS HAUL TRUCKS - UNMITIGATED

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2021 -- All model years in the range 1977 to 2021 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 67,200 | | | | |
| VMT/1000 | 14,128 | | | | |
| Trips | 340,066 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.92 | 11,840 | 5,370,535 | 0.38013 | |
| Idle Exh | 1.05 | 2,100 | 952,544 | | 2.80106 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 6.97 | 13,940 | 6,323,079 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 6.97 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 27.59 | 55,180 | 25,029,234 | 1.77160 | |
| Idle Exh | 5.31 | 10,620 | 4,817,152 | | 14.16535 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 32.9 | 65,800 | 29,846,387 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 63.24 | 126,480 | 57,370,379 | 4.06076 | |
| Idle Exh | 15.18 | 30,360 | 13,771,068 | | 40.49528 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 78.42 | 156,840 | 71,141,448 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 28.77 | 57,540 | 26,099,712 | 1,847.37489 | |
| Idle Exh | 0.83 | 1,660 | 752,964 | | 2,214.16887 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 29.59 | 59,180 | 26,843,604 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.04 | 6,080 | 2,757,842 | 0.19520 | |
| Idle Exh | 0.06 | 120 | 54,431 | | 0.16006 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 3.1 | 6,200 | 2,812,274 | | |
| | | | | | |
| TireWear | 0.56 | 1,120 | 508,024 | 0.03596 | |
| BrakeWr | 0.44 | 880 | 399,161 | 0.02825 | |
| ------- | | | | | |
| Total | 4.1 | 8,200 | 3,719,459 | | |
| Lead | 0 | | | | |
| SOx | 0.28 | 560 | 254,012 | 0.01798 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2663.52 | | | | |

## Project Construction

# HARBOR CRAFT EMISSION FACTORS

The NOX, ROG, and PM emission factors for both the unmitigated and mitigated scenarios are based on Tier 3 emission standards for marine vessels
Emission factors use a 95%/5% for NOX + HC, and a conversion factor of 1.053
CO emission factors do not change from Tier 2 to Tier 3. Thus, the CO emission factor is the Tier 2 emission standard
SO2, CO2 based on fuel consumption. N2O and CH4 from POLB inventory.

Calendar Year 2010

| | | | | | Unmitigated and Mitigated Criteria Pollutant Emission Factors (g/hp-hr) [2] | | | | | | GHG Emission Factors (g/hp-hr) [3] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Fuel | Number of Engines per Craft | Hp | Load Factor (%)[1] | NOx | CO | HC | ROG [4] | PM | SO2 | CO2 | N2O | CH4 |
| Work / Crew Boat (main engine) | diesel | 1 | 400 | 0.45 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Work / Crew Boat (auxiliary engine) | diesel | 1 | 25 | 0.43 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Tug Boat (main engine) | diesel | 2 | 1,300 | 0.31 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Tug Boat (auxiliary engine) | diesel | 2 | 57 | 0.43 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Push Tug/Tender (main engine) | diesel | 2 | 800 | 0.31 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Push Tug/Tender (auxiliary engine) | diesel | 2 | 138 | 0.43 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| | 1 | 2 | 4 | 5 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

**Reference:**

[1]: POLB 2008 Inventory, Chapter 3, Emission Factors for Harbor Craft

[2] Emission factors are adjusted for California diesel UL fuel (15 ppm sulfur).

[3] Cooper, David, and Tomas Gustafsson. *Methodology for Calculating Emissions from Ships: 1. Update of Emission Factors.* Swedish Environmental Protection Agency; Swedish Methodology for Environmental Data. Norrsköping, Sweden. 2004. http://www.smed.se. This is the same source as used by Starcrest Consulting for the Port of Los Angeles emissions inventory.

(4): ROG/HC conversion factor for diesel engines: http://www.epa.gov/otaq/models/nonrdmdl/p03002.pdf

**Equation 3: SOx Emission Factor**

| | | |
|---|---|---|
| SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF | 0.00552 | |
| Where: | | |
| X = S content in parts per million (ppm) | 15 | ppm |
| BSFC = Brake Specific Fuel Consumption (184 g/bhp-hr per CARB 2007 Harbor Craft | 184 | (g/hp-hr) |
| MW = Molecular Weight | 32 | S |
| | 64 | SO2 |

**Project Construction**

# LOCOMOTIVE EMISSION FACTORS

EPA Tier 1-4 Nonroad Diesel Engine Emission Standards, g/bhp-hr

| Engine Power | Tier | Year | CO | HC | NMHC + NOx | NOx | PM |
|---|---|---|---|---|---|---|---|
| 130 ≤ kW < 225 (175 ≤ hp < 300) | Tier 1 | 1996 | 8.5 | 1 | - | 6.9 | 0.4 |
| | Tier 2 | 2003 | 2.6 | - | 4.9 | - | 0.15 |
| | Tier 3 | 2006 | 2.6 | - | 3 | - | 0.15 |
| | Tier 4 | 2011-2014[d] | 2.6 | 0.14 | - | 0.3 | 0.015 |

EPA Tier 1-4 Nonroad Diesel Engine Emission Standards, g/bhp-hr

| Tier | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.05 | 8.50 | 6.90 | 0.01 | 0.39 | 0.39 | 114.28 | 0.01 | 0.00 |
| 2 | 0.26 | 2.60 | 4.66 | 0.01 | 0.15 | 0.15 | 34.96 | 0.00 | 0.00 |
| 3 | 0.16 | 2.60 | 2.85 | 0.01 | 0.15 | 0.15 | 34.96 | 0.00 | 0.00 |
| 4 | 0.15 | 2.60 | 0.30 | 0.01 | 0.01 | 0.01 | 34.96 | 0.00 | 0.00 |

NMHC/NOx Ratios

| | |
|---|---|
| NMHC/NMHC+NOx | 0.05 |
| NOx/NMHC+NOx | 0.95 |

PM Ratios

| | |
|---|---|
| PM10/PM | 0.98 |
| PM2.5/PM | 0.97 |

Hydrocarbon Ratios

| | |
|---|---|
| NMHC/HC | 0.98 |
| VOC/HC | 1.05 |

Fuel Based Factors

| Conversion Factor (gal/hp-hr) |
|---|
| 0.05 |

| SO2 Fuel Content (g/gal) | SO2 EF (g/hp-hr) |
|---|---|
| 0.09 | 0.01 |

| C Fuel Content (g/gal) | CO2 Fuel Content (g/gal) | CO2 EF (g/hp-hr) |
|---|---|---|
| 0.18 | 2,079.86 | 114.28 |
| 0.05 | 636.19 | 34.96 |
| 0.05 | 636.19 | 34.96 |
| 0.05 | 636.19 | 34.96 |

## Project Construction

# FUGITIVE DUST EMISSION FACTOR METHODOLOGY AND CALCULATION

| **Overview** | |
|---|---|
| Source Category | Materials Handling |
| Source Description | Conveyor transfer point |
| Location | Western US |

| **Emission Factors** | |
|---|---|
| PM10 Emission Factor Equation (lb/ton) | $EF=0.35(0.0032)\{[(U/5)^{1.3}]/[(M/2)^{1.4}]\}$ |
| Reference for PM10 EF Equation | AP-42, Section 13.2.4 |
| PM2.5/PM10 Ratio | 0.15 |
| Reference for PM2.5/PM10 Rato | MRI, 2006 |

| **Emission Factor Parameters** | |
|---|---|
| U--mean wind speed (mph) | 4.9 |
| M--moisture content (%) before water spray | 3 |
| M--moisture content (%) after water spray | 7 |

| **Control Methods and Efficiencies - for Unmitigated Scenario** | |
|---|---|
| Control Measure | Water spray located at conveyor transfer point |
| Control application/frequency | Continuous |
| Control Efficiency (from emission factor equation) | 68% |
| Reference | SCAQMD Rule 403 |

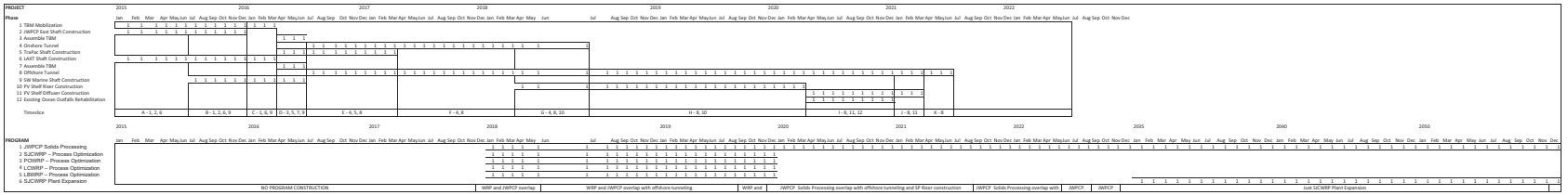
| | |
|---|---|
| Uncontrolled PM10 Emission Factor (lbs/ton) | 0.0005190192 |
| Uncontrolled PM10 Emission Factor (lbs/ton) | 0.0000778529 |

# Project Construction Calculations

## Alternative 2

**Project Construction - Alternative 2**

## PROJECT AND PROGRAM CONSTRUCTION OVERLAP



Project Construction - Alternative 2

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase

1 TBM Mobilization

Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unmitigated Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase

2 JWPCP East Shaft Construction

Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 2.4 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

**Project Construction - Alternative 2**

## ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase

**3 Assemble TBM**

Start Date 2016

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase

**4 Onshore Tunnel**

Start Date 2016

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 1 | 12 | 59520 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 1 | 12 | 28800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 1 | 24 | 71040 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.01 | 0.02 | 2294.94 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 0.25 | 0.37 | 40653.18 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.12 | 0.18 | 19670.89 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 0.30 | 0.44 | 48521.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.31 | 1.69 | 5.04 | 0.00 | 0.00 | 0.00 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | | 0.92 | 0.14 | | | | | | | | | 0.92 | 0.14 | | | | |
| On Site Total | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.6 | 85.6 | 16.9 | 0.2 | 2.2 | 1.3 | 184474.9 | 1.2 | 1.7 | 185012.5 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| Total | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 8 | 5 | 243611 | 2 | 2 | 244341 |

Project Construction - Alternative 2

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase

5 TraPac Shaft Construction

Start Date 2016

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.92 | 14.12 | 31.41 | 0.05 | 1.20 | 1.07 | 4652.56 | 0.35 | 0.00 | 4659.98 | 0.72 | 14.12 | 4.71 | 0.05 | 0.66 | 0.58 | 4652.56 | 0.06 | 0.00 | 4653.91 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.84 | 9.21 | 19.54 | 0.04 | 0.70 | 0.62 | 4439.05 | 0.26 | 0.00 | 4444.44 | 0.52 | 9.21 | 2.93 | 0.04 | 0.38 | 0.34 | 4439.05 | 0.05 | 0.00 | 4440.04 |
| Hydaulic Excavator - Medium | 0.80 | 2.56 | 5.99 | 0.01 | 0.20 | 0.18 | 1199.74 | 0.07 | 0.00 | 1201.26 | 0.15 | 2.56 | 0.90 | 0.01 | 0.11 | 0.10 | 1199.74 | 0.01 | 0.00 | 1200.02 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.87 | 2.71 | 7.27 | 0.01 | 0.25 | 0.22 | 1187.64 | 0.08 | 0.00 | 1189.28 | 0.16 | 2.71 | 1.09 | 0.01 | 0.14 | 0.12 | 1187.64 | 0.01 | 0.00 | 1187.94 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.77 | 2.37 | 5.67 | 0.01 | 0.19 | 0.17 | 1079.77 | 0.07 | 0.00 | 1081.22 | 0.14 | 2.37 | 0.85 | 0.01 | 0.10 | 0.09 | 1079.77 | 0.01 | 0.00 | 1080.03 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| | | | | | | | | | | | | | | On Site Total | 11.3 | 38.7 | 87.8 | 0.2 | 3.6 | 2.8 | 15550.2 | 1.0 | 0.0 | 15571.2 | 2.2 | 38.6 | 15.7 | 0.2 | 2.2 | 1.6 | 15550.2 | 0.2 | 0.0 | 15554.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 10.66 | 44.92 | 121.07 | 0.31 | 7.05 | 5.84 | 31697.93 | 0.09 | 0.08 | 31725.36 | 4.88 | 24.36 | 53.53 | 0.30 | 2.93 | 2.04 | 31697.93 | 0.09 | 0.08 | 31725.36 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.91 | 4.22 | 11.31 | 0.00 | 0.08 | 0.08 | 629.25 | 0.00 | 0.00 | 629.25 | 0.73 | 3.95 | 11.81 | 0.00 | 0.00 | 0.00 | 629.25 | 0.00 | 0.00 | 629.25 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 |
| | | | | | | | | | | | | | | | Total | 23 | 88 | 217 | 0 | 11 | 9 | 48069 | 1 | 0 | 48130 | 8 | 67 | 78 | 0 | 5 | 4 | 48069 | 0 | 0 | 48113 |

Phase

6 LAXT Shaft Construction

Start Date 2015

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| | | | | | | | | | | | | | | On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 2.4 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |

**Project Construction - Alternative 2**

## ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase

**7 Assemble TBM**

Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase

**8 Offshore Tunnel**

Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 200 | 200 | 1.00 | 1 | 24 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 8,000 | 8,000 | 1.00 | 1 | 12 | 96000 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 3,760 | 3,760 | 1.00 | 1 | 12 | 45120 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 3,600 | 3,600 | 1.00 | 1 | 24 | 86400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 0.40 | 0.60 | 65569.65 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 0.19 | 0.28 | 30817.74 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 0.36 | 0.54 | 59012.68 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 282 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 7050 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 | 0.40 | 2.15 | 6.40 | 0.00 | 0.01 | 0.01 | 342.82 | 0.00 | 0.00 | 342.82 |
| Fugitive Dust | | | | | 1.17 | 0.18 | | | | | | | | | 1.17 | 0.18 | | | | |
| On Site Total | 10.8 | 86.2 | 149.5 | 0.2 | 6.2 | 5.0 | 231945.3 | 9.8 | 2.1 | 232797.4 | 4.7 | 86.1 | 18.2 | 0.2 | 2.4 | 1.3 | 231945.3 | 1.5 | 2.1 | 232623.4 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 282 | 16920 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 282 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 23.12 | 97.45 | 262.63 | 0.68 | 15.30 | 12.66 | 68760.13 | 0.19 | 0.18 | 68819.63 | 10.58 | 52.84 | 116.11 | 0.64 | 6.36 | 4.42 | 68760.13 | 0.19 | 0.18 | 68819.63 |
| On-Road Truck | 1.97 | 9.15 | 24.53 | 0.00 | 0.18 | 0.17 | 1364.98 | 0.00 | 0.00 | 1364.98 | 1.58 | 8.57 | 25.62 | 0.00 | 0.00 | 0.00 | 1364.98 | 0.00 | 0.00 | 1364.98 |
| On-Road Crew Vehicle | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| Total | 37 | 206 | 432 | 1 | 22 | 18 | 305929 | 10 | 3 | 306986 | 18 | 161 | 155 | 1 | 9 | 6 | 305929 | 2 | 3 | 306812 |

**Project Construction - Alternative 2**

## ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

**Phase 9 — SW Marine Shaft Construction**

Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.3** | **40.0** | **17.1** | **0.2** | **2.4** | **1.7** | **15550.2** | **0.2** | **0.0** | **15554.2** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

**Phase 10 — PV Shelf Riser Construction**

Start Date 2018

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.480 | 3.765 | 3.233 | 0.007 | 0.203 | 0.181 | 568.300 | 0.043 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.416 | 1.522 | 3.117 | 0.005 | 0.118 | 0.105 | 549.583 | 0.038 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.414 | 3.288 | 2.759 | 0.006 | 0.146 | 0.130 | 568.300 | 0.037 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.325 | 1.139 | 1.916 | 0.006 | 0.069 | 0.061 | 568.300 | 0.029 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.334 | 1.189 | 2.146 | 0.006 | 0.072 | 0.064 | 568.300 | 0.030 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.346 | 1.259 | 2.438 | 0.006 | 0.087 | 0.078 | 568.300 | 0.031 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.369 | 1.247 | 2.804 | 0.006 | 0.095 | 0.085 | 568.300 | 0.033 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.442 | 3.727 | 3.133 | 0.007 | 0.189 | 0.168 | 568.300 | 0.040 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.355 | 1.218 | 2.277 | 0.006 | 0.077 | 0.068 | 568.300 | 0.032 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 3 | 2 | 2418 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 3 | 2 | 147.06 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 3 | 2 | 1080 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 3 | 2 | 64.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.184 | 1.003 | 1.111 | 0.006 | 0.034 | 0.030 | 568.300 | 0.017 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.413 | 1.252 | 4.432 | 0.006 | 0.118 | 0.105 | 568.300 | 0.037 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.342 | 1.142 | 2.542 | 0.006 | 0.091 | 0.081 | 568.300 | 0.031 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.236 | 1.064 | 2.395 | 0.006 | 0.077 | 0.068 | 568.300 | 0.021 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 |
| Tugboat - Aux | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 |
| Crew Boats | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 |
| Crew Boats - Aux | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.947 | 43.349 | 119.963 | 0.063 | 0.669 | 0.615 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.07 | 0.01 | | | | |
| **On Site Total** | **2.1** | **46.0** | **37.8** | **0.1** | **1.1** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.7** | **2.1** | **46.0** | **37.8** | **0.1** | **1.1** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.7** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.498 | 2.196 | 5.520 | 0.018 | 0.335 | 0.270 | 1843.150 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.969 | 14.451 | 39.988 | 0.000 | 0.226 | 0.208 | 2205.818 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.134 | 1.120 | 0.090 | 0.004 | 0.034 | 0.019 | 392.094 | 0.042 | 0.039 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.179 | 2.417 | 0.151 | 0.000 | 0.007 | 0.006 | 71.004 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 1.05 | 4.65 | 11.68 | 0.04 | 0.71 | 0.57 | 3900.85 | 0.01 | 0.01 | 3904.22 | 0.60 | 3.02 | 6.38 | 0.04 | 0.37 | 0.26 | 3900.85 | 0.01 | 0.01 | 3904.22 |
| On-Road Truck | 0.10 | 0.51 | 1.41 | 0.00 | 0.01 | 0.01 | 77.81 | 0.00 | 0.00 | 77.81 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.81 | 0.00 | 0.00 | 77.81 |
| On-Road Crew Vehicle | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 |
| On-Road Crew Vehicle | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 |
| **Total** | **3** | **53** | **51** | **0** | **2** | **2** | **12901** | **0** | **0** | **13041** | **3** | **51** | **45** | **0** | **1** | **1** | **12901** | **0** | **0** | **13041** |

Project Construction - Alternative 2

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase 11 — PV Shelf Diffuser Construction
Start Date 2020

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 1 | 8 | 2580 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 1 | 8 | 9440 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 2 | 8 | 5920 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 1 | 4 | 510 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 1 | 8 | 2960 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily NOx | Daily SO2 | Daily PM10 | Daily PM2.5 | Daily CO2 | Daily CH4 | Daily N2O | Daily CO2e | Mitigated ROG | Mitigated CO | Mitigated NOx | Mitigated SO2 | Mitigated PM10 | Mitigated PM2.5 | Mitigated CO2 | Mitigated CH4 | Mitigated N2O | Mitigated CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.91 | 5.70 | 4.15 | 0.03 | 0.12 | 0.11 | 3232.39 | 0.08 | 0.00 | 3234.12 | 0.17 | 5.70 | 0.62 | 0.03 | 0.07 | 0.06 | 3232.39 | 0.02 | 0.00 | 3232.71 |
| Pipe Barge | 7.83 | 24.96 | 81.49 | 0.12 | 2.04 | 1.82 | 11827.05 | 0.71 | 0.00 | 11841.89 | 1.43 | 24.96 | 12.22 | 0.12 | 1.12 | 0.99 | 11827.05 | 0.13 | 0.00 | 11829.77 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 4.05 | 14.46 | 26.09 | 0.07 | 0.95 | 0.85 | 7416.97 | 0.37 | 0.00 | 7424.64 | 0.74 | 14.46 | 3.91 | 0.07 | 0.52 | 0.46 | 7416.97 | 0.07 | 0.00 | 7418.37 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.34 | 1.29 | 2.51 | 0.01 | 0.08 | 0.08 | 638.96 | 0.03 | 0.00 | 639.61 | 0.06 | 1.29 | 0.38 | 0.01 | 0.05 | 0.04 | 638.96 | 0.01 | 0.00 | 639.08 |
| Pump | 1.37 | 6.72 | 12.32 | 0.04 | 0.40 | 0.36 | 3708.48 | 0.12 | 0.00 | 3711.08 | 0.25 | 6.72 | 1.85 | 0.04 | 0.22 | 0.20 | 3708.48 | 0.02 | 0.00 | 3708.96 |
| On-Road Truck - Idle | 0.03 | 0.13 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.07 | 0.01 | | | | |
| **On Site Total** | **15.8** | **81.3** | **149.8** | **0.3** | **4.3** | **3.8** | **31975.2** | **1.3** | **0.2** | **32075.6** | **3.9** | **81.3** | **42.2** | **0.3** | **2.7** | **2.3** | **31975.2** | **0.3** | **0.2** | **32053.1** |
| On-Road Truck | 0.87 | 4.00 | 9.44 | 0.04 | 0.60 | 0.47 | 3899.65 | 0.01 | 0.01 | 3903.03 | 0.60 | 3.02 | 6.23 | 0.04 | 0.38 | 0.27 | 3899.65 | 0.01 | 0.01 | 3903.03 |
| On-Road Truck | 0.10 | 0.50 | 1.42 | 0.00 | 0.01 | 0.01 | 78.11 | 0.00 | 0.00 | 78.11 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.11 | 0.00 | 0.00 | 78.11 |
| On-Road Crew Vehicle | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 |
| On-Road Crew Vehicle | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 |
| **Total** | **17** | **87** | **160** | **0** | **5** | **4** | **36455** | **1** | **0** | **36575** | **5** | **86** | **50** | **0** | **3** | **3** | **36455** | **0** | **0** | **36552** |

Phase 12 — Existing Ocean Outfalls Rehabilitation
Start Date 2020

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily NOx | Daily SO2 | Daily PM10 | Daily PM2.5 | Daily CO2 | Daily CH4 | Daily N2O | Daily CO2e | Mitigated ROG | Mitigated CO | Mitigated NOx | Mitigated SO2 | Mitigated PM10 | Mitigated PM2.5 | Mitigated CO2 | Mitigated CH4 | Mitigated N2O | Mitigated CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 |
| On-Road Crew Vehicle | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| **Total** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** |

**Project Construction - Alternative 2**

## EMISSIONS BY PHASE

| | | | Unmitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase | Start Date | Duration (Months) | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP East Shaft Construction | 1/1/2015 | 12 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 24 | 11 | 86 | 148 | 0 | 6 | 5 | 184,475 | 8 | 2 | 185,151 | 5 | 86 | 17 | 0 | 2 | 1 | 184,475 | 1 | 2 | 185,012 |
| 5 TraPac Shaft Construction | 4/1/2016 | 12 | 11 | 39 | 88 | 0 | 4 | 3 | 15,550 | 1 | - | 15,571 | 2 | 39 | 16 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 6 LAXT Shaft Construction | 1/1/2015 | 15 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 7 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 Offshore Tunnel | 7/1/2016 | 61 | 11 | 86 | 149 | 0 | 6 | 5 | 231,945 | 10 | 2 | 232,797 | 5 | 86 | 18 | 0 | 2 | 1 | 231,945 | 1 | 2 | 232,623 |
| 9 SW Marine Shaft Construction | 7/1/2015 | 12 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 10 PV Shelf Riser Construction | 4/1/2018 | 24 | 2 | 46 | 38 | 0 | 1 | 1 | 8,419 | 0 | 0 | 8,538 | 2 | 46 | 38 | 0 | 1 | 1 | 8,419 | 0 | 0 | 8,538 |
| 11 PV Shelf Diffuser Construction | 4/1/2020 | 12 | 16 | 81 | 150 | 0 | 4 | 4 | 31,975 | 1 | 0 | 32,076 | 4 | 81 | 42 | 0 | 3 | 2 | 31,975 | 0 | 0 | 32,053 |
| 12 Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 1 | 28 | 23 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 | 1 | 28 | 23 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 |

| | | | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase | Start Date | Duration (Months) | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP East Shaft Construction | 1/1/2015 | 12 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 24 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| 5 TraPac Shaft Construction | 4/1/2016 | 12 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| 6 LAXT Shaft Construction | 1/1/2015 | 15 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 7 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 Offshore Tunnel | 7/1/2016 | 61 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| 9 SW Marine Shaft Construction | 7/1/2015 | 12 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 10 PV Shelf Riser Construction | 4/1/2018 | 24 | 3 | 53 | 51 | 0 | 2 | 2 | 12,901 | 0 | 0 | 13,041 | 3 | 51 | 45 | 0 | 1 | 1 | 12,901 | 0 | 0 | 13,041 |
| 11 PV Shelf Diffuser Construction | 4/1/2020 | 12 | 17 | 87 | 160 | 0 | 5 | 4 | 36,455 | 1 | 0 | 36,575 | 5 | 86 | 50 | 0 | 3 | 3 | 36,455 | 0 | 0 | 36,552 |
| 12 Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 1 | 28.96 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 |

**Project Construction - Alternative 2**

## EMISSONS BY DAY

| | | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Timeslice | Phase | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| A | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **49** | **188** | **488** | **1** | **24** | **20** | **96,094** | **2** | **0** | **96,218** | **16** | **137** | **163** | **1** | **10** | **7** | **96,094** | **1** | **0** | **96,181** |
| B | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **74** | **282** | **732** | **1** | **36** | **29** | **144,140** | **4** | **0** | **144,327** | **24** | **205** | **244** | **1** | **16** | **11** | **144,140** | **1** | **0** | **144,272** |
| C | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| D | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **48** | **182** | **461** | **1** | **23** | **19** | **96,116** | **2** | **0** | **96,239** | **16** | **136** | **159** | **1** | **10** | **7** | **96,116** | **1** | **0** | **96,204** |
| E | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 5 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| | **Total** | **92** | **477** | **1,020** | **2** | **51** | **42** | **597,610** | **20** | **5** | **599,596** | **41** | **375** | **358** | **2** | **22** | **15** | **597,610** | **4** | **5** | **599,266** |
| F | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| | **Total** | **69** | **389** | **802** | **2** | **40** | **33** | **549,540** | **19** | **5** | **551,466** | **34** | **308** | **279** | **2** | **17** | **11** | **549,540** | **4** | **5** | **551,153** |
| G | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| | 10 | 3 | 53 | 51 | 0 | 2 | 2 | 12,901 | 0 | 0 | 13,041 | 3 | 51 | 45 | 0 | 1 | 1 | 12,901 | 0 | 0 | 13,041 |
| | **Total** | **72** | **441** | **853** | **2** | **42** | **35** | **562,441** | **19** | **5** | **564,506** | **37** | **359** | **325** | **2** | **18** | **12** | **562,441** | **4** | **5** | **564,194** |
| H | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| | 10 | 3 | 53 | 51 | 0 | 2 | 2 | 12,901 | 0 | 0 | 13,041 | 3 | 51 | 45 | 0 | 1 | 1 | 12,901 | 0 | 0 | 13,041 |
| | **Total** | **40** | **258** | **482** | **1** | **24** | **20** | **318,830** | **11** | **3** | **320,027** | **21** | **212** | **200** | **1** | **11** | **7** | **318,830** | **2** | **3** | **319,853** |
| I | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| | 11 | 17 | 87 | 160 | 0 | 5 | 4 | 36,455 | 1 | 0 | 36,575 | 5 | 86 | 50 | 0 | 3 | 3 | 36,455 | 0 | 0 | 36,552 |
| | 12 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 |
| | **Total** | **55** | **322** | **615** | **1** | **28** | **23** | **347,864** | **12** | **3** | **349,124** | **24** | **276** | **227** | **1** | **13** | **9** | **347,864** | **3** | **3** | **348,927** |
| J | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| | 11 | 17 | 87 | 160 | 0 | 5 | 4 | 36,455 | 1 | 0 | 36,575 | 5 | 86 | 50 | 0 | 3 | 3 | 36,455 | 0 | 0 | 36,552 |
| | **Total** | **54** | **293** | **592** | **1** | **27** | **22** | **342,384** | **12** | **3** | **343,561** | **23** | **247** | **204** | **1** | **12** | **9** | **342,384** | **2** | **3** | **343,364** |
| K | 8 | 37 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 2 | 3 | 306,812 |
| | **Total** | **37** | **206** | **432** | **1** | **22** | **18** | **305,929** | **10** | **3** | **306,986** | **18** | **161** | **155** | **1** | **9** | **6** | **305,929** | **2** | **3** | **306,812** |
| **Maximum Daily Emissions** | | **92** | **477** | **1,020** | **2** | **51** | **42** | **597,610** | **20** | **5** | **599,596** | **41** | **375** | **358** | **2** | **22** | **15** | **597,610** | **4** | **5** | **599,266** |

## Project Construction - Alternative 2

# GHG EMISSIONS BY PHASE

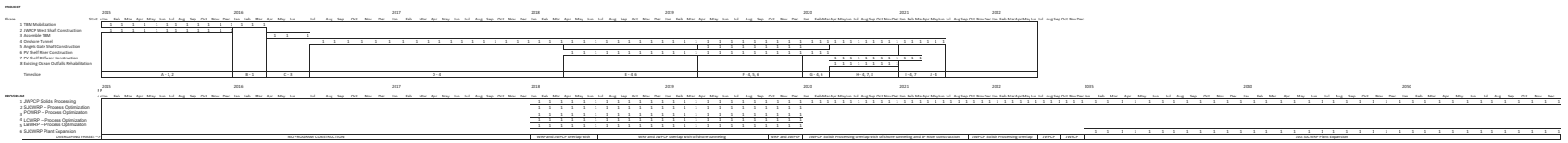
| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP East Shaft Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | 7/1/2016 | 24 | 59,073 | 2 | 1 | 59,284 | 59,073 | 0 | 1 | 59,250 |
| 5 | TraPac Shaft Construction | 4/1/2016 | 12 | 5,820 | 0 | 0 | 5,828 | 5,820 | 0 | 0 | 5,825 |
| 6 | LAXT Shaft Construction | 1/1/2015 | 15 | 7,272 | 0 | 0 | 7,281 | 7,272 | 0 | 0 | 7,278 |
| 7 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 8 | Offshore Tunnel | 7/1/2016 | 61 | 185,717 | 6 | 2 | 186,358 | 185,717 | 1 | 2 | 186,253 |
| 9 | SW Marine Shaft Construction | 7/1/2015 | 12 | 5,833 | 0 | 0 | 5,841 | 5,833 | 0 | 0 | 5,839 |
| 10 | PV Shelf Riser Construction | 4/1/2018 | 24 | 3,133 | 0 | 0 | 3,167 | 3,133 | 0 | 0 | 3,167 |
| 11 | PV Shelf Diffuser Construction | 4/1/2020 | 12 | 4,414 | 0 | 0 | 4,428 | 4,414 | 0 | 0 | 4,426 |
| 12 | Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 499 | 0 | 0 | 507 | 499 | 0 | 0 | 507 |
| | Total | | | | | | 278,519 | | | | 278,368 |
| | Amortized Total | | | | | | 9,284 | | | | 9,279 |

# Project Construction Calculations

# Alternative 3

**Project Construction - Alternative 3**

# PROJECT AND PROGRAM CONSTRUCTION OVERLAP



Project Construction - Alternative 3

# ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 1 — TBM Mobilization — Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | | Unmitigated Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000 | 0.000 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Tota | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 2 — JWPCP West Shaft Construction — Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000 | 0.000 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Tota | 11.9 | 40.1 | 97.2 | 0.2 | 3.4 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 1.9 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| | | | | | | | | | | | | | | | Total | 25 | 94 | 244 | 0 | 11 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Project Construction - Alternative 3

## ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 3 – Assemble TBM (Start Date 2016)

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Tota | | | | | | | | | | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 4 – Onshore Tunnel (Start Date 2016)

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 1 | 12 | 59520 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 1 | 12 | 28800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 1 | 24 | 71040 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.01 | 0.02 | 2294.94 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 0.25 | 0.37 | 40653.18 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.12 | 0.18 | 19670.89 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 0.30 | 0.44 | 48521.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.31 | 1.69 | 5.04 | 0.00 | 0.00 | 0.00 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.92 | 0.14 | | | | | | | | | 0.46 | 0.07 | | | | |
| On Site Tota | | | | | | | | | | | | | | | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.6 | 85.6 | 16.9 | 0.2 | 1.7 | 1.2 | 184474.9 | 1.2 | 1.7 | 185012.5 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| Total | | | | | | | | | | | | | | | | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 7 | 5 | 243611 | 2 | 2 | 244341 |

Project Construction - Alternative 3

# ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 5 — Angels Gate Shaft Construction — Start Date 2019

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.34 | 12.38 | 24.11 | 0.05 | 0.90 | 0.80 | 4652.56 | 0.30 | 0.00 | 4658.88 | 0.61 | 12.38 | 3.62 | 0.05 | 0.49 | 0.44 | 4652.56 | 0.06 | 0.00 | 4653.71 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.40 | 8.79 | 13.07 | 0.04 | 0.47 | 0.42 | 4439.05 | 0.22 | 0.00 | 4443.59 | 0.44 | 8.79 | 1.96 | 0.04 | 0.26 | 0.23 | 4439.05 | 0.04 | 0.00 | 4439.88 |
| Hydaulic Excavator - Medium | 0.66 | 2.49 | 3.92 | 0.01 | 0.13 | 0.12 | 1199.74 | 0.06 | 0.00 | 1201.00 | 0.12 | 2.49 | 0.59 | 0.01 | 0.07 | 0.06 | 1199.74 | 0.01 | 0.00 | 1199.97 |
| Loader | 1.64 | 6.12 | 10.85 | 0.03 | 0.39 | 0.35 | 2833.38 | 0.15 | 0.00 | 2836.49 | 0.30 | 6.12 | 1.63 | 0.03 | 0.21 | 0.19 | 2833.38 | 0.03 | 0.00 | 2833.95 |
| Motor Grader | 0.73 | 2.57 | 5.24 | 0.01 | 0.18 | 0.16 | 1187.64 | 0.07 | 0.00 | 1189.02 | 0.13 | 2.57 | 0.79 | 0.01 | 0.10 | 0.09 | 1187.64 | 0.01 | 0.00 | 1187.89 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.63 | 2.29 | 3.76 | 0.01 | 0.13 | 0.11 | 1079.77 | 0.06 | 0.00 | 1080.97 | 0.12 | 2.29 | 0.56 | 0.01 | 0.07 | 0.06 | 1079.77 | 0.01 | 0.00 | 1079.99 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 | 0.21 | 1.03 | 2.88 | 0.00 | 0.01 | 0.01 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| | | | | | | | | | | | | | | On Site Tota | 9.6 | 35.7 | 63.8 | 0.2 | 2.8 | 2.1 | 15550.2 | 0.8 | 0.0 | 15568.0 | 1.9 | 35.6 | 12.1 | 0.2 | 1.5 | 1.1 | 15550.2 | 0.2 | 0.0 | 15553.4 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 | 7.76 | 34.93 | 84.99 | 0.31 | 5.26 | 4.19 | 31683.00 | 0.09 | 0.08 | 31710.43 | 4.91 | 24.55 | 51.18 | 0.32 | 3.05 | 2.15 | 31683.00 | 0.09 | 0.08 | 31710.43 |
| On-Road Truck | onroad | | 130 | | | g/trip | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 | 0.84 | 4.11 | 11.52 | 0.00 | 0.06 | 0.05 | 629.47 | 0.00 | 0.00 | 629.47 | 0.73 | 3.96 | 11.80 | 0.00 | 0.00 | 0.00 | 629.47 | 0.00 | 0.00 | 629.47 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| | | | | | | | | | | | | | | | Total | 18 | 75 | 158 | 0 | 8 | 6 | 48053 | 1 | 0 | 48109 | 7 | 64 | 72 | 0 | 5 | 3 | 48053 | 0 | 0 | 48095 |

Phase 6 — PV Shelf Riser Construction — Start Date 2018

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.480 | 3.765 | 3.233 | 0.007 | 0.203 | 0.181 | 568.300 | 0.043 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.416 | 1.522 | 3.117 | 0.005 | 0.118 | 0.105 | 549.583 | 0.038 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.414 | 3.288 | 2.759 | 0.006 | 0.146 | 0.130 | 568.300 | 0.037 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.325 | 1.139 | 1.916 | 0.006 | 0.069 | 0.061 | 568.300 | 0.029 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.334 | 1.189 | 2.146 | 0.006 | 0.072 | 0.064 | 568.300 | 0.030 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.346 | 1.259 | 2.438 | 0.006 | 0.087 | 0.078 | 568.300 | 0.031 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.369 | 1.247 | 2.804 | 0.006 | 0.095 | 0.085 | 568.300 | 0.033 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.442 | 3.727 | 3.133 | 0.007 | 0.189 | 0.168 | 568.300 | 0.040 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.355 | 1.218 | 2.277 | 0.006 | 0.077 | 0.068 | 568.300 | 0.032 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 3 | 2 | 2418 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 3 | 2 | 147.06 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 3 | 2 | 1080 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 3 | 2 | 64.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.184 | 1.003 | 1.111 | 0.006 | 0.034 | 0.030 | 568.300 | 0.017 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.413 | 1.252 | 4.432 | 0.006 | 0.118 | 0.105 | 568.300 | 0.037 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.342 | 1.142 | 2.542 | 0.006 | 0.091 | 0.081 | 568.300 | 0.031 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.236 | 1.064 | 2.395 | 0.006 | 0.077 | 0.068 | 568.300 | 0.021 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 |
| Tugboat - Aux | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 |
| Crew Boats | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 |
| Crew Boats - Aux | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.947 | 43.349 | 119.963 | 0.063 | 0.669 | 0.615 | 6617.135 | 0.000 | 0.000 | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.07 | 0.01 | | | | | | | | | 0.03 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Tota | 2.1 | 46.0 | 37.8 | 0.1 | 1.1 | 0.9 | 8418.5 | 0.0 | 0.4 | 8537.7 | 2.1 | 46.0 | 37.8 | 0.1 | 1.0 | 0.9 | 8418.5 | 0.0 | 0.4 | 8537.7 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.498 | 2.196 | 5.520 | 0.018 | 0.335 | 0.270 | 1843.150 | 0.005 | 0.005 | 1.05 | 4.65 | 11.68 | 0.04 | 0.71 | 0.57 | 3900.85 | 0.01 | 0.01 | 3904.22 | 0.60 | 3.02 | 6.38 | 0.04 | 0.37 | 0.26 | 3900.85 | 0.01 | 0.01 | 3904.22 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.969 | 14.451 | 39.988 | 0.000 | 0.226 | 0.208 | 2205.818 | 0.000 | 0.000 | 0.10 | 0.51 | 1.41 | 0.00 | 0.01 | 0.01 | 77.81 | 0.00 | 0.00 | 77.81 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.81 | 0.00 | 0.00 | 77.81 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.134 | 1.120 | 0.090 | 0.004 | 0.034 | 0.019 | 392.094 | 0.042 | 0.039 | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.179 | 2.417 | 0.151 | 0.000 | 0.007 | 0.006 | 71.004 | 0.000 | 0.000 | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 |
| | | | | | | | | | | | | | | | Total | 3 | 53 | 51 | 0 | 2 | 2 | 12901 | 0 | 0 | 13041 | 3 | 51 | 45 | 0 | 1 | 1 | 12901 | 0 | 0 | 13041 |

Project Construction - Alternative 3

# ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 7 — PV Shelf Diffuser Construction — Start Date 2020

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 1 | 8 | 2580 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 | 0.91 | 5.70 | 4.15 | 0.03 | 0.12 | 0.11 | 3232.39 | 0.08 | 0.00 | 3234.12 | 0.17 | 5.70 | 0.62 | 0.03 | 0.07 | 0.06 | 3232.39 | 0.02 | 0.00 | 3232.71 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 1 | 8 | 9440 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 | 7.83 | 24.96 | 81.49 | 0.12 | 2.04 | 1.82 | 11827.05 | 0.71 | 0.00 | 11841.89 | 1.43 | 24.96 | 12.22 | 0.12 | 1.12 | 0.99 | 11827.05 | 0.13 | 0.00 | 11829.77 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 2 | 8 | 5920 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 | 4.05 | 14.46 | 26.09 | 0.07 | 0.95 | 0.85 | 7416.97 | 0.37 | 0.00 | 7424.64 | 0.74 | 14.46 | 3.91 | 0.07 | 0.52 | 0.46 | 7416.97 | 0.07 | 0.00 | 7418.37 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 1 | 4 | 510 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 | 0.34 | 1.29 | 2.51 | 0.01 | 0.08 | 0.08 | 638.96 | 0.03 | 0.00 | 639.61 | 0.06 | 1.29 | 0.38 | 0.01 | 0.05 | 0.04 | 638.96 | 0.01 | 0.00 | 639.08 |
| Pump | offroad | 500 | - | 500 | 0.74 | 1 | 8 | 2960 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 | 1.37 | 6.72 | 12.32 | 0.04 | 0.40 | 0.36 | 3708.48 | 0.12 | 0.00 | 3711.08 | 0.25 | 6.72 | 1.85 | 0.04 | 0.22 | 0.20 | 3708.48 | 0.02 | 0.00 | 3708.96 |
| | | Daily Trips | Idle Time (min)[a] | | Tons Soil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | 16 | 5 | | | | | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 | 0.03 | 0.13 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 400 | | | | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.07 | 0.01 | | | | | | | | | 0.03 | 0.00 | | | | |
| | | | | | | | | | | | | | | | | | | On Site Tota | 15.8 | 81.3 | 149.8 | 0.3 | 4.3 | 3.8 | 31975.2 | 1.3 | 0.2 | 32075.6 | 3.9 | 81.3 | 42.2 | 0.3 | 2.6 | 2.3 | 31975.2 | 0.3 | 0.2 | 32053.1 |
| | | | Miles / Trip | Daily Trips | | Miles / Day | Acres Disturbed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| On-Road Truck | onroad | | 60 | 16 | | 960 | | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 | 0.87 | 4.00 | 9.44 | 0.04 | 0.60 | 0.47 | 3899.65 | 0.01 | 0.01 | 3903.03 | 0.60 | 3.02 | 6.23 | 0.04 | 0.38 | 0.27 | 3899.65 | 0.01 | 0.01 | 3903.03 |
| On-Road Truck | onroad | | | 16 | | | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 | 0.10 | 0.50 | 1.42 | 0.00 | 0.01 | 0.01 | 78.11 | 0.00 | 0.00 | 78.11 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.11 | 0.00 | 0.00 | 78.11 |
| On-Road Crew Vehicle | onroad | | 20 | 30 | | 600 | | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 |
| On-Road Crew Vehicle | onroad | | | 30 | | | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 |
| | | | | | | | | | | | | | | | | | | Total | 17 | 87 | 160 | 0 | 5 | 4 | 36455 | 1 | 0 | 36575 | 5 | 86 | 50 | 0 | 3 | 3 | 36455 | 0 | 0 | 36552 |

Phase 8 — Existing Ocean Outfalls Rehabilitation — Start Date 2020

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Daily Trips | Idle Time (min)[a] | | Tons Soil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | - | 5 | | | | | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0 | | | | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | | | | | On Site Tota | 1.3 | 28.0 | 22.9 | 0.0 | 0.6 | 0.6 | 5131.9 | 0.0 | 0.2 | 5204.8 | 1.3 | 28.0 | 22.9 | 0.0 | 0.6 | 0.6 | 5131.9 | 0.0 | 0.2 | 5204.8 |
| | | | Miles / Trip | Daily Trips | | Miles / Day | Acres Disturbed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| On-Road Truck | onroad | | 60 | 0 | | 0 | | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | | 0 | | | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 20 | 20 | | 400 | | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 |
| On-Road Crew Vehicle | onroad | | | 20 | | | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| | | | | | | | | | | | | | | | | | | Total | 1 | 29 | 23 | 0 | 1 | 1 | 5480 | 0 | 0 | 5563 | 1 | 29 | 23 | 0 | 1 | 1 | 5480 | 0 | 0 | 5563 |

**Project Construction - Alternative 3**

## EMISSIONS BY PHASE

| Phase | Start Date | Duration (Months) | Unmitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP West Shaft Construction | 1/1/2015 | 12 | 12 | 40 | 97 | 0 | 3 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 61 | 11 | 86 | 148 | 0 | 6 | 5 | 184,475 | 8 | 2 | 185,151 | 5 | 86 | 17 | 0 | 2 | 1 | 184,475 | 1 | 2 | 185,012 |
| 5 Angels Gate Shaft Construction | 4/1/2019 | 9 | 10 | 36 | 64 | 0 | 3 | 2 | 15,550 | 1 | - | 15,568 | 2 | 36 | 12 | 0 | 1 | 1 | 15,550 | 0 | - | 15,553 |
| 6 PV Shelf Riser Construction | 4/1/2018 | 24 | 2 | 46 | 38 | 0 | 1 | 1 | 8,419 | 0 | 0 | 8,538 | 2 | 46 | 38 | 0 | 1 | 1 | 8,419 | 0 | 0 | 8,538 |
| 7 PV Shelf Diffuser Construction | 4/1/2020 | 12 | 16 | 81 | 150 | 0 | 4 | 4 | 31,975 | 1 | 0 | 32,076 | 4 | 81 | 42 | 0 | 3 | 2 | 31,975 | 0 | 0 | 32,053 |
| 8 Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 1 | 28 | 23 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 | 1 | 28 | 23 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 |

| Phase | Start Date | Duration (Months) | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP West Shaft Construction | 1/1/2015 | 12 | 25 | 94 | 244 | 0 | 11 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 61 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| 5 Angels Gate Shaft Construction | 4/1/2019 | 9 | 18 | 75 | 158 | 0 | 8 | 6 | 48,053 | 1 | 0 | 48,109 | 7 | 64 | 72 | 0 | 5 | 3 | 48,053 | 0 | 0 | 48,095 |
| 6 PV Shelf Riser Construction | 4/1/2018 | 24 | 3 | 53 | 51 | 0 | 2 | 2 | 12,901 | 0 | 0 | 13,041 | 3 | 51 | 45 | 0 | 1 | 1 | 12,901 | 0 | 0 | 13,041 |
| 7 PV Shelf Diffuser Construction | 4/1/2020 | 12 | 17 | 87 | 160 | 0 | 5 | 4 | 36,455 | 1 | 0 | 36,575 | 5 | 86 | 50 | 0 | 3 | 3 | 36,455 | 0 | 0 | 36,552 |
| 8 Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 |

**Project Construction - Alternative 3**

## EMISSIONS BY DAY

| | | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Timeslice | Phase | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| A | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 11 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **25** | **94** | **244** | **0** | **11** | **10** | **48,047** | **1** | **0** | **48,109** | **8** | **68** | **81** | **0** | **5** | **4** | **48,047** | **0** | **0** | **48,091** |
| B | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| C | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| D | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| | **Total** | **32** | **183** | **371** | **1** | **18** | **15** | **243,611** | **8** | **2** | **244,480** | **16** | **147** | **125** | **1** | **7** | **5** | **243,611** | **2** | **2** | **244,341** |
| E | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 6 | 3 | 53 | 51 | 0 | 2 | 2 | 12,901 | 0 | 0 | 13,041 | 3 | 51 | 45 | 0 | 1 | 1 | 12,901 | 0 | 0 | 13,041 |
| | **Total** | **35** | **236** | **421** | **1** | **20** | **17** | **256,512** | **9** | **3** | **257,520** | **18** | **198** | **170** | **1** | **9** | **6** | **256,512** | **2** | **3** | **257,382** |
| F | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 5 | 18 | 75 | 158 | 0 | 8 | 6 | 48,053 | 1 | 0 | 48,109 | 7 | 64 | 72 | 0 | 5 | 3 | 48,053 | 0 | 0 | 48,095 |
| | 6 | 3 | 53 | 51 | 0 | 2 | 2 | 12,901 | 0 | 0 | 13,041 | 3 | 51 | 45 | 0 | 1 | 1 | 12,901 | 0 | 0 | 13,041 |
| | **Total** | **53** | **310** | **579** | **1** | **28** | **23** | **304,565** | **10** | **3** | **305,630** | **26** | **263** | **242** | **1** | **13** | **9** | **304,565** | **2** | **3** | **305,476** |
| G | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 6 | 3 | 53 | 51 | 0 | 2 | 2 | 12,901 | 0 | 0 | 13,041 | 3 | 51 | 45 | 0 | 1 | 1 | 12,901 | 0 | 0 | 13,041 |
| | **Total** | **35** | **236** | **421** | **1** | **20** | **17** | **256,512** | **9** | **3** | **257,520** | **18** | **198** | **170** | **1** | **9** | **6** | **256,512** | **2** | **3** | **257,382** |
| H | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 7 | 17 | 87 | 160 | 0 | 5 | 4 | 36,455 | 1 | 0 | 36,575 | 5 | 86 | 50 | 0 | 3 | 3 | 36,455 | 0 | 0 | 36,552 |
| | 8 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 |
| | **Total** | **50** | **299** | **554** | **1** | **24** | **20** | **285,546** | **10** | **3** | **286,618** | **22** | **263** | **197** | **1** | **11** | **8** | **285,546** | **2** | **3** | **286,457** |
| I | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 7 | 17 | 87 | 160 | 0 | 5 | 4 | 36,455 | 1 | 0 | 36,575 | 5 | 86 | 50 | 0 | 3 | 3 | 36,455 | 0 | 0 | 36,552 |
| | **Total** | **49** | **270** | **531** | **1** | **23** | **20** | **280,066** | **10** | **3** | **281,055** | **20** | **234** | **174** | **1** | **10** | **8** | **280,066** | **2** | **3** | **280,893** |
| J | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 2 | 2 | 244,341 |
| | **Total** | **32** | **183** | **371** | **1** | **18** | **15** | **243,611** | **8** | **2** | **244,480** | **16** | **147** | **125** | **1** | **7** | **5** | **243,611** | **2** | **2** | **244,341** |
| **Maximum Daily Emissions** | | **53** | **310** | **579** | **1** | **28** | **23** | **304,565** | **10** | **3** | **305,630** | **26** | **263** | **242** | **1** | **13** | **9** | **304,565** | **2** | **3** | **305,476** |

## Project Construction - Alternative 3

# GHG EMISSIONS BY PHASE

| Phase | | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 | TBM Mobilization | | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP West Shaft Construction | | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | | 7/1/2016 | 61 | 147,886 | 5 | 1 | 148,413 | 147,886 | 1 | 1 | 148,329 |
| 5 | Angels Gate Shaft Construction | | 4/1/2019 | 9 | 4,380 | 0 | 0 | 4,385 | 4,380 | 0 | 0 | 4,383 |
| 6 | PV Shelf Riser Construction | | 4/1/2018 | 24 | 3,133 | 0 | 0 | 3,167 | 3,133 | 0 | 0 | 3,167 |
| 7 | PV Shelf Diffuser Construction | | 4/1/2020 | 12 | 4,414 | 0 | 0 | 4,428 | 4,414 | 0 | 0 | 4,426 |
| 8 | Existing Ocean Outfalls Rehabilitation | | 4/1/2020 | 9 | 499 | 0 | 0 | 507 | 499 | 0 | 0 | 507 |
| 9 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 10 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 11 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 12 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| | Total | | | | | | | 166,725 | | | | 166,635 |
| | Amortized Total | | | | | | | 5,558 | | | | 5,554 |

# Project Construction Calculations

# Alternative 4

**Project Construction - Alternative 4**

**PROJECT AND PROGRAM CONSTRUCTION OVERLAP**

**Project Construction - Alternative 4**

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

## Phase 1 TBM Mobilization

Start Date 2015

| Equipment | Type | HP (Equipment Specs) | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG (Emission Factor) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | ROG (Unmitigated Daily Emission Rates (lbs/day)) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG (Mitigated Daily Emission Rates (lbs/day)) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.0002 | 0.00002 | | | |

| Equipment | ROG (Unmitigated) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG (Mitigated) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG (Unmitigated) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG (Mitigated) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Phase 2 JWPCP West Shaft Site Construction

Start Date 2015

| Equipment | Type | HP (Equipment Specs) | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG (Emission Factor) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | ROG (Daily Emission Rates (lbs/day)) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG (Mitigated Daily Emission Rates (lbs/day)) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.0002 | 0.00002 | | | |

| Equipment | ROG (Daily) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG (Mitigated) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 2.4 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG (Daily) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG (Mitigated) | CO | NOx | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

**Project Construction - Alternative 4**

## ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase

3 Assemble TBM

Start Date 2016

| Equipment | Type | HP (Equipment Specs) | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG (Emission Factor) | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG (Daily Emission Rates (lbs/day)) | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG (Mitigated Daily Emission Rates (lbs/day)) | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[2] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase

4 Tunneling

Start Date 2016

| Equipment | Type | HP (Equipment Specs) | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG (Emission Factor) | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 1 | 12 | 59520 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 1 | 12 | 28800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 1 | 24 | 71040 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG (Daily Emission Rates (lbs/day)) | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG (Mitigated Daily Emission Rates (lbs/day)) | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.01 | 0.02 | 2294.94 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 0.25 | 0.37 | 40653.18 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.12 | 0.18 | 19670.89 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 0.30 | 0.44 | 48521.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[2] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.31 | 1.69 | 5.04 | 0.00 | 0.00 | 0.00 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.92 | 0.14 | | | | | | | | | 0.92 | 0.14 | | | | |
| | | | | | | | | | | | | | | On Site Total | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.6 | 85.6 | 16.9 | 0.2 | 2.2 | 1.3 | 184474.9 | 1.2 | 1.7 | 185012.5 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| | | | | | | | | | | | | | | | Total | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 8 | 5 | 243611 | 2 | 2 | 244341 |

Project Construction - Alternative 4

# ON AND OFFROAD EMISSION CALCULATIONS BY PHASE

Phase 5 — Royal Palms Shaft Site Construction — Start Date 2019

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.34 | 12.38 | 24.11 | 0.05 | 0.90 | 0.80 | 4652.56 | 0.30 | 0.00 | 4658.88 | 0.61 | 12.38 | 3.62 | 0.05 | 0.49 | 0.44 | 4652.56 | 0.06 | 0.00 | 4653.71 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.40 | 8.79 | 13.07 | 0.04 | 0.47 | 0.42 | 4439.05 | 0.22 | 0.00 | 4443.59 | 0.44 | 8.79 | 1.96 | 0.04 | 0.26 | 0.23 | 4439.05 | 0.04 | 0.00 | 4439.88 |
| Hydaulic Excavator - Medium | 0.66 | 2.49 | 3.92 | 0.01 | 0.13 | 0.12 | 1199.74 | 0.06 | 0.00 | 1201.00 | 0.12 | 2.49 | 0.59 | 0.01 | 0.07 | 0.06 | 1199.74 | 0.01 | 0.00 | 1199.97 |
| Loader | 1.64 | 6.12 | 10.85 | 0.03 | 0.39 | 0.35 | 2833.38 | 0.15 | 0.00 | 2836.49 | 0.30 | 6.12 | 1.63 | 0.03 | 0.21 | 0.19 | 2833.38 | 0.03 | 0.00 | 2833.95 |
| Motor Grader | 0.73 | 2.57 | 5.24 | 0.01 | 0.18 | 0.16 | 1187.64 | 0.07 | 0.00 | 1189.02 | 0.13 | 2.57 | 0.79 | 0.01 | 0.10 | 0.09 | 1187.64 | 0.01 | 0.00 | 1187.89 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.63 | 2.29 | 3.76 | 0.01 | 0.13 | 0.11 | 1079.77 | 0.06 | 0.00 | 1080.97 | 0.12 | 2.29 | 0.56 | 0.01 | 0.07 | 0.06 | 1079.77 | 0.01 | 0.00 | 1079.99 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[3] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.0002 | 0.00002 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.21 | 1.03 | 2.88 | 0.00 | 0.01 | 0.01 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| On Site Total | 9.6 | 35.7 | 63.8 | 0.2 | 2.8 | 2.1 | 15550.2 | 0.8 | 0.0 | 15568.0 | 1.9 | 35.6 | 12.1 | 0.2 | 1.8 | 1.2 | 15550.2 | 0.2 | 0.0 | 15553.4 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 7.76 | 34.93 | 84.99 | 0.31 | 5.26 | 4.19 | 31683.00 | 0.09 | 0.08 | 31710.43 | 4.91 | 24.55 | 51.18 | 0.32 | 3.05 | 2.15 | 31683.00 | 0.09 | 0.08 | 31710.43 |
| On-Road Truck | 0.84 | 4.11 | 11.52 | 0.00 | 0.06 | 0.05 | 629.47 | 0.00 | 0.00 | 629.47 | 0.73 | 3.96 | 11.80 | 0.00 | 0.00 | 0.00 | 629.47 | 0.00 | 0.00 | 629.47 |
| On-Road Crew Vehicle | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 |
| On-Road Crew Vehicle | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| Total | 18 | 75 | 158 | 0 | 8 | 6 | 48053 | 1 | 0 | 48109 | 7 | 64 | 72 | 0 | 5 | 3 | 48053 | 0 | 0 | 48095 |

Phase 6 — Existing Ocean Outfalls Rehabilitation — Start Date 2020

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[3] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.0002 | 0.00002 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 1.3 | 28.0 | 22.9 | 0.0 | 0.6 | 0.6 | 5131.9 | 0.0 | 0.2 | 5204.8 | 1.3 | 28.0 | 22.9 | 0.0 | 0.6 | 0.6 | 5131.9 | 0.0 | 0.2 | 5204.8 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 |
| On-Road Crew Vehicle | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| Total | 1 | 29 | 23 | 0 | 1 | 1 | 5480 | 0 | 0 | 5563 | 1 | 29 | 23 | 0 | 1 | 1 | 5480 | 0 | 0 | 5563 |

**Project Construction - Alternative 4**

## EMISSIONS BY PHASE

| | Unmitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| 1 TBM Mobilization | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP West Shaft Site Construction | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 3 Assemble TBM | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Tunneling | 11 | 86 | 148 | 0 | 6 | 5 | 184,475 | 8 | 2 | 185,151 | 5 | 86 | 17 | 0 | 2 | 1 | 184,475 | 1 | 2 | 185,012 |
| 5 Royal Palms Shaft Site Construction | 10 | 36 | 64 | 0 | 3 | 2 | 15,550 | 1 | - | 15,568 | 2 | 36 | 12 | 0 | 2 | 1 | 15,550 | 0 | - | 15,553 |
| 6 Existing Ocean Outfalls Rehabilitation | 1 | 28 | 23 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 | 1 | 28 | 23 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,205 |

| | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 TBM Mobilization | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP West Shaft Site Construction | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 3 Assemble TBM | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Tunneling | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| 5 Royal Palms Shaft Site Construction | 18 | 75 | 158 | 0 | 8 | 6 | 48,053 | 1 | 0 | 48,109 | 7 | 64 | 72 | 0 | 5 | 3 | 48,053 | 0 | 0 | 48,095 |
| 6 Existing Ocean Outfalls Rehabilitation | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 |

**Project Construction - Alternative 4**

## EMISSIONS BY DAY

| | | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Timeslice | Phase | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| A | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48,047** | **1** | **0** | **48,109** | **8** | **68** | **81** | **0** | **5** | **4** | **48,047** | **0** | **0** | **48,091** |
| B | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| C | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| D | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| | **Total** | **32** | **183** | **371** | **1** | **18** | **15** | **243,611** | **8** | **2** | **244,480** | **16** | **147** | **125** | **1** | **8** | **5** | **243,611** | **2** | **2** | **244,341** |
| E | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 5 | 18 | 75 | 158 | 0 | 8 | 6 | 48,053 | 1 | 0 | 48,109 | 7 | 64 | 72 | 0 | 5 | 3 | 48,053 | 0 | 0 | 48,095 |
| | 6 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 | 1 | 29 | 23 | 0 | 1 | 1 | 5,480 | 0 | 0 | 5,563 |
| | **Total** | **51** | **287** | **551** | **1** | **27** | **22** | **297,144** | **9** | **3** | **298,152** | **24** | **241** | **220** | **1** | **13** | **9** | **297,144** | **2** | **3** | **297,999** |
| F | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 8 | 5 | 243,611 | 2 | 2 | 244,341 |
| | 5 | 18 | 75 | 158 | 0 | 8 | 6 | 48,053 | 1 | 0 | 48,109 | 7 | 64 | 72 | 0 | 5 | 3 | 48,053 | 0 | 0 | 48,095 |
| | **Total** | **50** | **258** | **528** | **1** | **27** | **22** | **291,664** | **9** | **2** | **292,589** | **23** | **212** | **197** | **1** | **12** | **8** | **291,664** | **2** | **2** | **292,436** |
| G | 5 | 18 | 75 | 158 | 0 | 8 | 6 | 48,053 | 1 | 0 | 48,109 | 7 | 64 | 72 | 0 | 5 | 3 | 48,053 | 0 | 0 | 48,095 |
| | **Total** | **18** | **75** | **158** | **0** | **8** | **6** | **48,053** | **1** | **0** | **48,109** | **7** | **64** | **72** | **0** | **5** | **3** | **48,053** | **0** | **0** | **48,095** |
| **Maximum Daily Emissions** | | **51** | **287** | **551** | **1** | **27** | **22** | **297,144** | **9** | **3** | **298,152** | **24** | **241** | **220** | **1** | **13** | **9** | **297,144** | **2** | **3** | **297,999** |

Project Contruction - Alternative 4

## GHG EMISSIONS BY PHASE

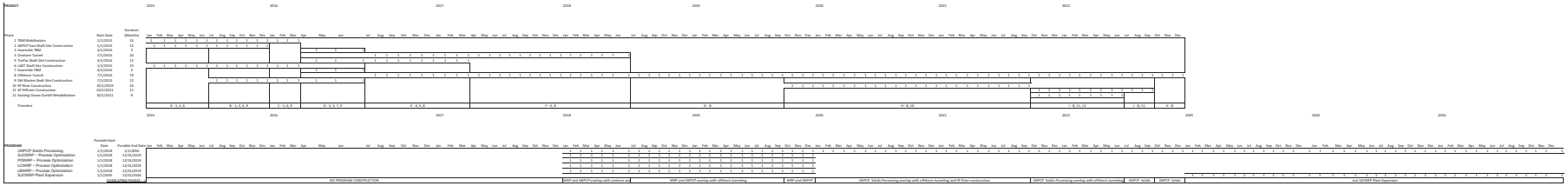
| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP West Shaft Site Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Tunneling | 7/1/2016 | 49 | 118,309 | 4 | 1 | 118,731 | 118,309 | 1 | 1 | 118,663 |
| 5 | Royal Palms Shaft Site Construction | 4/1/2019 | 9 | 4,380 | 0 | 0 | 4,385 | 4,380 | 0 | 0 | 4,383 |
| 6 | Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 499 | 0 | 0 | 507 | 499 | 0 | 0 | 507 |
| 7 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 8 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 9 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 10 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 11 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 12 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| | Total | | | | | | 129,447 | | | | 129,377 |
| | Amortized Total | | | | | | 4,315 | | | | 4,313 |

# Project Construction Calculations

## Alternative 5

**Project Construction - Alternative 5**

**PROJECT AND PROGRAM CONTRUCTION OVERLAP**




| Phase | Start Date | Duration (Months) |
|---|---|---|
| 1. TBM Mobilization | 1/1/2015 | 15 |
| 2. JWPCP East Shaft Site Construction | 1/1/2015 | 12 |
| 3. Assemble TBM | 4/1/2016 | 3 |
| 4. Tunnel Drive | 7/1/2016 | 79 |
| 5. Truxtun Shaft Site Construction | 4/1/2016 | 12 |
| 6. LSRT Shaft Site Construction | 1/1/2015 | 15 |
| 7. Assemble TBM | 4/1/2016 | 3 |
| 8. Offshore Tunnel | 7/1/2016 | 79 |
| 9. Pitt Marine Shaft Site Construction | 7/1/2015 | 12 |
| 10. SP River Construction | 10/1/2019 | 24 |
| 11. Existing Ocean Outfall Rehabilitation | 10/1/2020 | 12 |
| 12. Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 |
| Trenchless | | |

A–1, 4, 9 | B–1, 2, 8, 9 | C–1, 6, 9 | D–1, 5, 7, 9 | E–6, 9, 8 | F–6, 8 | G–8 | H–8, 10 | I–8, 11, 12 | J–8, 11 | K–8




| PROGRAM | Possible Start Date | Possible End Date |
|---|---|---|
| JWPCP Solids Processing | 1/1/2018 | 1/1/2050 |
| SJCWRP – Process Optimization | 1/1/2018 | 12/31/2019 |
| POWRP – Process Optimization | 1/1/2018 | 12/31/2019 |
| LCWRP – Process Optimization | 1/1/2018 | 12/31/2019 |
| LBWRP – Process Optimization | 1/1/2018 | 12/31/2019 |
| SJCWRP Plant Expansion | 1/1/2035 | 12/31/2050 |




NO PROGRAM CONSTRUCTION | WRP and JWPCP overlap with offshore and | WRP and JWPCP overlap with offshore tunneling | SDRP and JWPCP | JWPCP Solids Processing overlap with offshore tunneling and SP River construction | JWPCP Solids Processing overlap with offshore tunneling | JWPCP Solids | JWPCP Solids | Joint SJCWRP Plant Expansion

**Project Construction - Alternative 5**

## ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase

**1 TBM Mobilization** — Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.6 | 3.8 | 4.3 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.5 | 1.8 | 4.0 | 0.0 | 0.2 | 0.1 | 549.6 | 0.0 | 0.0 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.5 | 3.3 | 4.0 | 0.0 | 0.2 | 0.2 | 568.3 | 0.0 | 0.0 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.4 | 1.2 | 2.8 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.2 | 3.2 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.4 | 1.4 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.4 | 1.3 | 3.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.6 | 3.8 | 4.2 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.3 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.6 | 2.2 | 7.5 | 0.0 | 0.4 | 0.3 | 915.9 | 0.0 | 0.0 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.0 | 3.9 | 9.0 | 0.0 | 0.6 | 0.5 | 915.9 | 0.0 | 0.0 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.7 | 2.4 | 10.7 | 0.0 | 0.4 | 0.4 | 915.9 | 0.0 | 0.0 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.3 | 6.9 | 6.7 | 0.0 | 0.6 | 0.5 | 915.9 | 0.0 | 0.0 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.2 | 1.0 | 1.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.5 | 1.4 | 5.3 | 0.0 | 0.2 | 0.1 | 568.3 | 0.0 | 0.0 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.3 | 3.5 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.7 | 2.4 | 10.7 | 0.0 | 0.4 | 0.4 | 915.9 | 0.0 | 0.0 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.3 | 2.6 | 4.7 | 0.0 | 0.1 | 0.1 | 35.0 | 0.0 | 0.0 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.3 | 1.2 | 3.3 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unmitigated Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase

**2 JWPCP East Shaft Site Construction** — Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.4 | 40.1 | 17.0 | 0.2 | 2.2 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

**Project Construction - Alternative 5**

## ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase: 3 — Assemble TBM

Start Date: 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase: 4 — Onshore Tunnel

Start Date: 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 1 | 12 | 59520 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 1 | 12 | 28800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 1 | 24 | 71040 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | | 0.92 | 0.14 | | | | | | | | | 0.46 | 0.07 | | | | |
| On Site Total | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.7 | 85.7 | 16.7 | 0.2 | 1.8 | 1.3 | 184474.9 | 7.5 | 1.7 | 185145.1 |
| On-Road Truck | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| Total | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 7 | 5 | 243611 | 8 | 2 | 244474 |

**Project Construction - Alternative 5**

# ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 5 — TraPac Shaft Site Construction — Start Date 2016

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.92 | 14.12 | 31.41 | 0.05 | 1.20 | 1.07 | 4652.56 | 0.35 | 0.00 | 4659.98 | 0.72 | 14.12 | 4.71 | 0.05 | 0.66 | 0.58 | 4652.56 | 0.06 | 0.00 | 4653.91 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.84 | 9.21 | 19.54 | 0.04 | 0.70 | 0.62 | 4439.05 | 0.26 | 0.00 | 4444.44 | 0.52 | 9.21 | 2.93 | 0.04 | 0.38 | 0.34 | 4439.05 | 0.05 | 0.00 | 4440.04 |
| Hydaulic Excavator - Medium | 0.80 | 2.56 | 5.99 | 0.01 | 0.20 | 0.18 | 1199.74 | 0.07 | 0.00 | 1201.26 | 0.15 | 2.56 | 0.90 | 0.01 | 0.11 | 0.10 | 1199.74 | 0.01 | 0.00 | 1200.02 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.87 | 2.71 | 7.27 | 0.01 | 0.25 | 0.22 | 1187.64 | 0.08 | 0.00 | 1189.28 | 0.16 | 2.71 | 1.09 | 0.01 | 0.14 | 0.12 | 1187.64 | 0.01 | 0.00 | 1187.94 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.77 | 2.37 | 5.67 | 0.01 | 0.19 | 0.17 | 1079.77 | 0.07 | 0.00 | 1081.22 | 0.14 | 2.37 | 0.85 | 0.01 | 0.10 | 0.09 | 1079.77 | 0.01 | 0.00 | 1080.03 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| **On Site Total** | **11.3** | **38.7** | **87.8** | **0.2** | **3.6** | **2.8** | **15550.2** | **1.0** | **0.0** | **15571.2** | **2.3** | **38.7** | **15.6** | **0.2** | **2.0** | **1.6** | **15550.2** | **0.2** | **0.0** | **15554.0** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 10.66 | 44.92 | 121.07 | 0.31 | 7.05 | 5.84 | 31697.93 | 0.09 | 0.08 | 31725.36 | 4.88 | 24.36 | 53.53 | 0.30 | 2.93 | 2.04 | 31697.93 | 0.09 | 0.08 | 31725.36 |
| On-Road Truck | 0.91 | 4.22 | 11.31 | 0.00 | 0.08 | 0.08 | 629.25 | 0.00 | 0.00 | 629.25 | 0.73 | 3.95 | 11.81 | 0.00 | 0.00 | 0.00 | 629.25 | 0.00 | 0.00 | 629.25 |
| On-Road Crew Vehicle | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 |
| On-Road Crew Vehicle | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 |
| **Total** | **23** | **88** | **217** | **0** | **11** | **9** | **48069** | **1** | **0** | **48130** | **8** | **67** | **78** | **0** | **5** | **4** | **48069** | **0** | **0** | **48113** |

Phase 6 — LAXT Shaft Site Construction — Start Date 2015

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.4** | **40.1** | **17.0** | **0.2** | **2.2** | **1.7** | **15550.2** | **0.2** | **0.0** | **15554.2** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | Daily: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

**Project Construction - Alternative 5**

## ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 7 — Assemble TBM — Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | | | | | | | | | | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 8 — Offshore Tunnel — Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 200 | 200 | 1.00 | 1 | 24 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | offroad | - | 8,000 | 8,000 | 1.00 | 1 | 12 | 96000 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 3,760 | 3,760 | 1.00 | 1 | 12 | 45120 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 3,600 | 3,600 | 1.00 | 1 | 24 | 86400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 10.31 | | | | | | | | | | | | | | | | | | | |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 282 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 |
| Fugitive Dust | | | | 7050 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 1.17 | 0.18 | | | | | | | | | 0.59 | 0.09 | | | | |
| On Site Total | | | | | | | | | | | | | | | 21.1 | 86.2 | 149.5 | 0.2 | 6.2 | 5.0 | 231945.3 | 9.8 | 2.1 | 232797.4 | 4.8 | 86.2 | 18.0 | 0.2 | 1.9 | 1.3 | 231945.3 | 9.5 | 2.1 | 232791.4 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 282 | 16920 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 23.12 | 97.45 | 262.63 | 0.68 | 15.30 | 12.66 | 68760.13 | 0.19 | 0.18 | 68819.63 | 10.58 | 52.84 | 116.11 | 0.64 | 6.36 | 4.42 | 68760.13 | 0.19 | 0.18 | 68819.63 |
| On-Road Truck | onroad | | 282 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.97 | 9.15 | 24.53 | 0.00 | 0.18 | 0.17 | 1364.98 | 0.00 | 0.00 | 1364.98 | 1.58 | 8.57 | 25.62 | 0.00 | 0.00 | 0.00 | 1364.98 | 0.00 | 0.00 | 1364.98 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| Total | | | | | | | | | | | | | | | | 47.35 | 206 | 432 | 1 | 22 | 18 | 305929 | 10 | 3 | 306986 | 18 | 161 | 155 | 1 | 9 | 6 | 305929 | 10 | 3 | 306980 |

**Project Construction - Alternative 5**

## ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 9 — SW Marine Shaft Site Construction — Start Date 2015

| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| | | | | | | | | | | | | | | On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.4 | 40.1 | 17.0 | 0.2 | 2.2 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| | | | | | | | | | | | | | | | Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase 10 — SP Riser Cosntruction — Start Date 2019

| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 3 | 2 | 2418 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 | 3.07 | 11.50 | 39.98 | 0.03 | 1.93 | 1.77 | 4882.47 | 0.03 | 0.22 | 4951.77 | 0.90 | 11.50 | 9.60 | 0.03 | 1.05 | 0.97 | 4882.47 | 0.01 | 0.22 | 4951.35 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 3 | 2 | 147.06 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 | 0.32 | 1.28 | 2.92 | 0.00 | 0.19 | 0.18 | 296.95 | 0.00 | 0.01 | 301.16 | 0.08 | 1.28 | 0.76 | 0.00 | 0.12 | 0.11 | 296.95 | 0.00 | 0.01 | 301.13 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 3 | 2 | 1080 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 | 1.61 | 5.66 | 25.58 | 0.01 | 1.06 | 0.98 | 2180.76 | 0.01 | 0.10 | 2211.71 | 0.47 | 5.66 | 6.14 | 0.01 | 0.58 | 0.54 | 2180.76 | 0.00 | 0.10 | 2211.52 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 3 | 2 | 64.5 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 | 0.32 | 0.98 | 0.96 | 0.00 | 0.08 | 0.08 | 130.24 | 0.00 | 0.01 | 132.09 | 0.08 | 0.98 | 0.25 | 0.00 | 0.05 | 0.05 | 130.24 | 0.00 | 0.01 | 132.08 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 | 0.67 | 2.36 | 10.66 | 0.01 | 0.44 | 0.41 | 908.65 | 0.01 | 0.04 | 921.55 | 0.12 | 2.36 | 1.60 | 0.01 | 0.24 | 0.22 | 908.65 | 0.00 | 0.04 | 921.45 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.07 | 0.01 | | | | | | | | | 0.03 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Total | 6.0 | 21.9 | 80.4 | 0.1 | 3.8 | 3.4 | 8418.5 | 0.0 | 0.4 | 8537.7 | 1.7 | 21.9 | 18.7 | 0.1 | 2.1 | 1.9 | 8418.5 | 0.0 | 0.4 | 8537.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 | 0.96 | 4.30 | 10.46 | 0.04 | 0.65 | 0.52 | 3899.45 | 0.01 | 0.01 | 3902.82 | 0.60 | 3.02 | 6.30 | 0.04 | 0.37 | 0.26 | 3899.45 | 0.01 | 0.01 | 3902.82 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 | 0.10 | 0.51 | 1.42 | 0.00 | 0.01 | 0.01 | 77.47 | 0.00 | 0.00 | 77.47 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.47 | 0.00 | 0.00 | 77.47 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 |
| | | | | | | | | | | | | | | | Total | 7 | 28 | 92 | 0 | 4 | 4 | 12898 | 0 | 0 | 13037 | 3 | 27 | 26 | 0 | 2 | 2 | 12898 | 0 | 0 | 13037 |

**Project Construction - Alternative 5**

# ON AND OFFROAD CONSTRUCTION CALCULATIONS BY PHASE

Phase 11 — SP Diffuser Construction — Start Date 2021

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 1 | 8 | 2580 | g/hp-hr |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 1 | 8 | 9440 | g/hp-hr |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr |
| Generator | offroad | 500 | - | 500 | 0.74 | 2 | 8 | 5920 | g/hp-hr |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr |
| Hoist | offroad | 250 | - | 250 | 0.51 | 1 | 4 | 510 | g/hp-hr |
| Pump | offroad | 500 | - | 500 | 0.74 | 1 | 8 | 2960 | g/hp-hr |

| Equipment | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 2.05 | 7.67 | 26.65 | 0.02 | 1.28 | 1.18 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.22 | 0.85 | 1.95 | 0.00 | 0.13 | 0.12 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.54 | 1.89 | 8.53 | 0.00 | 0.35 | 0.33 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.11 | 0.33 | 0.32 | 0.00 | 0.03 | 0.03 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.86 | 5.70 | 3.38 | 0.03 | 0.10 | 0.09 | 3232.39 | 0.08 | 0.00 | 3234.03 |
| Pipe Barge | 7.35 | 24.46 | 76.05 | 0.12 | 1.82 | 1.62 | 11827.05 | 0.66 | 0.00 | 11840.97 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 3.85 | 14.31 | 22.92 | 0.07 | 0.84 | 0.75 | 7416.97 | 0.35 | 0.00 | 7424.26 |
| Service Vessel | 0.67 | 2.36 | 10.66 | 0.01 | 0.44 | 0.41 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.33 | 1.27 | 2.20 | 0.01 | 0.07 | 0.07 | 638.96 | 0.03 | 0.00 | 639.58 |
| Pump | 1.30 | 6.65 | 10.84 | 0.04 | 0.36 | 0.32 | 3708.48 | 0.12 | 0.00 | 3710.94 |

| Equipment | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.60 | 7.67 | 6.40 | 0.02 | 0.70 | 0.65 | 3254.98 | 0.01 | 0.15 | 3300.90 |
| Tugboat - Aux | 0.05 | 0.85 | 0.51 | 0.00 | 0.08 | 0.07 | 197.96 | 0.00 | 0.01 | 200.76 |
| Crew Boats | 0.16 | 1.89 | 2.05 | 0.00 | 0.19 | 0.18 | 726.92 | 0.00 | 0.03 | 737.17 |
| Crew Boats - Aux | 0.03 | 0.33 | 0.08 | 0.00 | 0.02 | 0.02 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.16 | 5.70 | 0.51 | 0.03 | 0.06 | 0.05 | 3232.39 | 0.01 | 0.00 | 3232.69 |
| Pipe Barge | 1.34 | 24.46 | 11.41 | 0.12 | 1.00 | 0.89 | 11827.05 | 0.12 | 0.00 | 11829.60 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.70 | 14.31 | 3.44 | 0.07 | 0.46 | 0.41 | 7416.97 | 0.06 | 0.00 | 7418.30 |
| Service Vessel | 0.12 | 2.36 | 1.60 | 0.01 | 0.24 | 0.22 | 908.65 | 0.00 | 0.04 | 921.45 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.06 | 1.27 | 0.33 | 0.01 | 0.04 | 0.04 | 638.96 | 0.01 | 0.00 | 639.07 |
| Pump | 0.24 | 6.65 | 1.63 | 0.04 | 0.20 | 0.17 | 3708.48 | 0.02 | 0.00 | 3708.93 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | EF ROG | EF CO | EF $NO_x$ | EF $SO_2$ | EF $PM_{10}$ | EF $PM_{2.5}$ | EF $CO_2$ | EF $CH_4$ | EF $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.07 | 0.01 | | | | | | | | | 0.03 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Total | 17.3 | 65.6 | 163.8 | 0.3 | 5.5 | 4.9 | 31975.2 | 1.3 | 0.2 | 32074.0 | 3.5 | 65.6 | 28.3 | 0.3 | 3.0 | 2.7 | 31975.2 | 0.2 | 0.2 | 32052.4 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | EF ROG | EF CO | EF $NO_x$ | EF $SO_2$ | EF $PM_{10}$ | EF $PM_{2.5}$ | EF $CO_2$ | EF $CH_4$ | EF $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 | 0.80 | 3.75 | 8.59 | 0.04 | 0.55 | 0.42 | 3909.79 | 0.01 | 0.01 | 3913.16 | 0.60 | 3.00 | 6.17 | 0.04 | 0.38 | 0.27 | 3909.79 | 0.01 | 0.01 | 3913.16 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 | 0.10 | 0.50 | 1.43 | 0.00 | 0.01 | 0.01 | 78.10 | 0.00 | 0.00 | 78.10 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.10 | 0.00 | 0.00 | 78.10 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 |
| | | | | | | | | | | | | | | | Total | 18 | 71 | 174 | 0 | 6 | 5 | 36467 | 1 | 0 | 36585 | 4 | 70 | 36 | 0 | 3 | 3 | 36467 | 0 | 0 | 36563 |

Phase 12 — Existing Ocean Outfall Rehabilitation — Start Date 2021

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Slurry Circuit Pumps (discharge | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |

| Equipment | Emission Factor: ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 2.05 | 7.67 | 26.65 | 0.02 | 1.28 | 1.18 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.22 | 0.85 | 1.95 | 0.00 | 0.13 | 0.12 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.54 | 1.89 | 8.53 | 0.00 | 0.35 | 0.33 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.11 | 0.33 | 0.32 | 0.00 | 0.03 | 0.03 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.67 | 2.36 | 10.66 | 0.01 | 0.44 | 0.41 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.60 | 7.67 | 6.40 | 0.02 | 0.70 | 0.65 | 3254.98 | 0.01 | 0.15 | 3300.90 |
| Tugboat - Aux | 0.05 | 0.85 | 0.51 | 0.00 | 0.08 | 0.07 | 197.96 | 0.00 | 0.01 | 200.76 |
| Crew Boats | 0.16 | 1.89 | 2.05 | 0.00 | 0.19 | 0.18 | 726.92 | 0.00 | 0.03 | 737.17 |
| Crew Boats - Aux | 0.03 | 0.33 | 0.08 | 0.00 | 0.02 | 0.02 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.12 | 2.36 | 1.60 | 0.01 | 0.24 | 0.22 | 908.65 | 0.00 | 0.04 | 921.45 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | EF ROG | EF CO | EF $NO_x$ | EF $SO_2$ | EF $PM_{10}$ | EF $PM_{2.5}$ | EF $CO_2$ | EF $CH_4$ | EF $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Total | 3.6 | 13.1 | 48.1 | 0.0 | 2.2 | 2.1 | 5131.9 | 0.0 | 0.2 | 5204.8 | 1.0 | 13.1 | 10.6 | 0.0 | 1.2 | 1.1 | 5131.9 | 0.0 | 0.2 | 5204.3 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | EF ROG | EF CO | EF $NO_x$ | EF $SO_2$ | EF $PM_{10}$ | EF $PM_{2.5}$ | EF $CO_2$ | EF $CH_4$ | EF $N_2O$ | Daily ROG | Daily CO | Daily $NO_x$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_x$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 |
| | | | | | | | | | | | | | | | Total | 4 | 14 | 48 | 0 | 2 | 2 | 5481 | 0 | 0 | 5564 | 1 | 14 | 11 | 0 | 1 | 1 | 5481 | 0 | 0 | 5564 |

**Project Construction - Alternative 5**

## EMISSIONS BY PHASE

**PROJECT**

| Phase | Start Date | Duration (Months) | Unmitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Localized Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 24 | 11 | 86 | 148 | 0 | 6 | 5 | 184,475 | 8 | 2 | 185,151 | 5 | 86 | 17 | 0 | 2 | 1 | 184,475 | 8 | 2 | 185,145 |
| 5 TraPac Shaft Site Construction | 4/1/2016 | 12 | 11 | 39 | 88 | 0 | 4 | 3 | 15,550 | 1 | - | 15,571 | 2 | 39 | 16 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 6 LAXT Shaft Site Construction | 1/1/2015 | 15 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 7 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 Offshore Tunnel | 7/1/2016 | 79 | 21 | 86 | 149 | 0 | 6 | 5 | 231,945 | 10 | 2 | 232,797 | 5 | 86 | 18 | 0 | 2 | 1 | 231,945 | 9 | 2 | 232,791 |
| 9 SW Marine Shaft Site Construction | 7/1/2015 | 12 | 12 | 40 | 97 | 0 | 4 | 3 | 15,550 | 1 | - | 15,572 | 2 | 40 | 17 | 0 | 2 | 2 | 15,550 | 0 | - | 15,554 |
| 10 SP Riser Cosntruction | 10/1/2019 | 24 | 6 | 22 | 80 | 0 | 4 | 3 | 8,419 | 0 | 0 | 8,538 | 2 | 22 | 19 | 0 | 2 | 2 | 8,419 | 0 | 0 | 8,537 |
| 11 SP Diffuser Construction | 10/1/2021 | 12 | 17 | 66 | 164 | 0 | 5 | 5 | 31,975 | 1 | 0 | 32,074 | 3 | 66 | 28 | 0 | 3 | 3 | 31,975 | 0 | 0 | 32,052 |
| 12 Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 4 | 13 | 48 | 0 | 2 | 2 | 5,132 | 0 | 0 | 5,205 | 1 | 13 | 11 | 0 | 1 | 1 | 5,132 | 0 | 0 | 5,204 |

| Phase | Start Date | Duration (Months) | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 3 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 Onshore Tunnel | 7/1/2016 | 24 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 8 | 2 | 244,474 |
| 5 TraPac Shaft Site Construction | 4/1/2016 | 12 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| 6 LAXT Shaft Site Construction | 1/1/2015 | 15 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 7 Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 Offshore Tunnel | 7/1/2016 | 79 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| 9 SW Marine Shaft Site Construction | 7/1/2015 | 12 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| 10 SP Riser Cosntruction | 10/1/2019 | 24 | 7 | 28 | 92 | 0 | 4 | 4 | 12,898 | 0 | 0 | 13,037 | 3 | 27 | 26 | 0 | 2 | 2 | 12,898 | 0 | 0 | 13,037 |
| 11 SP Diffuser Construction | 10/1/2021 | 12 | 18 | 71 | 174 | 0 | 6 | 5 | 36,467 | 1 | 0 | 36,585 | 4 | 70 | 36 | 0 | 3 | 3 | 36,467 | 0 | 0 | 36,563 |
| 12 Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 4 | 14 | 48 | 0 | 2 | 2 | 5,481 | 0 | 0 | 5,564 | 1 | 14 | 11 | 0 | 1 | 1 | 5,481 | 0 | 0 | 5,564 |

**Project Construction - Alternative 5**

## EMISSIONS BY DAY

| | | Unmitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Regional Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Timeslice | Phase | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| A | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **49** | **188** | **488** | **1** | **24** | **20** | **96,094** | **2** | **0** | **96,218** | **16** | **137** | **163** | **1** | **10** | **7** | **96,094** | **1** | **0** | **96,181** |
| B | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **74** | **282** | **732** | **1** | **36** | **29** | **144,140** | **4** | **0** | **144,327** | **24** | **205** | **244** | **1** | **15** | **11** | **144,140** | **1** | **0** | **144,272** |
| C | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| D | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9 | 25 | 94 | 244 | 0 | 12 | 10 | 48,047 | 1 | 0 | 48,109 | 8 | 68 | 81 | 0 | 5 | 4 | 48,047 | 0 | 0 | 48,091 |
| | **Total** | **48** | **182** | **461** | **1** | **23** | **19** | **96,116** | **2** | **0** | **96,239** | **16** | **136** | **159** | **1** | **10** | **7** | **96,116** | **1** | **0** | **96,204** |
| E | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 8 | 2 | 244,474 |
| | 5 | 23 | 88 | 217 | 0 | 11 | 9 | 48,069 | 1 | 0 | 48,130 | 8 | 67 | 78 | 0 | 5 | 4 | 48,069 | 0 | 0 | 48,113 |
| | 8 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **102** | **477** | **1,020** | **2** | **51** | **42** | **597,610** | **20** | **5** | **599,596** | **41** | **375** | **358** | **2** | **21** | **14** | **597,610** | **19** | **5** | **599,566** |
| F | 4 | 32 | 183 | 371 | 1 | 18 | 15 | 243,611 | 8 | 2 | 244,480 | 16 | 147 | 125 | 1 | 7 | 5 | 243,611 | 8 | 2 | 244,474 |
| | 8 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **79** | **389** | **802** | **2** | **40** | **33** | **549,540** | **19** | **5** | **551,466** | **34** | **308** | **279** | **2** | **16** | **11** | **549,540** | **18** | **5** | **551,454** |
| G | 8 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **47** | **206** | **432** | **1** | **22** | **18** | **305,929** | **10** | **3** | **306,986** | **18** | **161** | **155** | **1** | **9** | **6** | **305,929** | **10** | **3** | **306,980** |
| H | 8 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | 10 | 7 | 28 | 92 | 0 | 4 | 4 | 12,898 | 0 | 0 | 13,037 | 3 | 27 | 26 | 0 | 2 | 2 | 12,898 | 0 | 0 | 13,037 |
| | **Total** | **55** | **234** | **524** | **1** | **26** | **22** | **318,827** | **11** | **3** | **320,023** | **21** | **187** | **181** | **1** | **11** | **8** | **318,827** | **10** | **3** | **320,017** |
| I | 8 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | 11 | 18 | 71 | 174 | 0 | 6 | 5 | 36,467 | 1 | 0 | 36,585 | 4 | 70 | 36 | 0 | 3 | 3 | 36,467 | 0 | 0 | 36,563 |
| | 12 | 4 | 14 | 48 | 0 | 2 | 2 | 5,481 | 0 | 0 | 5,564 | 1 | 14 | 11 | 0 | 1 | 1 | 5,481 | 0 | 0 | 5,564 |
| | **Total** | **69** | **291** | **653** | **1** | **30** | **25** | **347,877** | **12** | **3** | **349,135** | **23** | **245** | **201** | **1** | **13** | **10** | **347,877** | **10** | **3** | **349,107** |
| J | 8 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | 11 | 18 | 71 | 174 | 0 | 6 | 5 | 36,467 | 1 | 0 | 36,585 | 4 | 70 | 36 | 0 | 3 | 3 | 36,467 | 0 | 0 | 36,563 |
| | **Total** | **66** | **277** | **605** | **1** | **28** | **23** | **342,396** | **12** | **3** | **343,571** | **22** | **231** | **190** | **1** | **12** | **9** | **342,396** | **10** | **3** | **343,543** |
| K | 8 | 47 | 206 | 432 | 1 | 22 | 18 | 305,929 | 10 | 3 | 306,986 | 18 | 161 | 155 | 1 | 9 | 6 | 305,929 | 10 | 3 | 306,980 |
| | **Total** | **47** | **206** | **432** | **1** | **22** | **18** | **305,929** | **10** | **3** | **306,986** | **18** | **161** | **155** | **1** | **9** | **6** | **305,929** | **10** | **3** | **306,980** |
| **Maximum Daily Emissions** | | **102** | **477** | **1,020** | **2** | **51** | **42** | **597,610** | **20** | **5** | **599,596** | **41** | **375** | **358** | **2** | **21** | **14** | **597,610** | **19** | **5** | **599,566** |

## Project Construction - Alternative 5

# GHG EMISSIONS BY PHASE

| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | 7/1/2016 | 24 | 59,073 | 2 | 1 | 59,284 | 59,073 | 2 | 1 | 59,283 |
| 5 | TraPac Shaft Site Construction | 4/1/2016 | 12 | 5,820 | 0 | 0 | 5,828 | 5,820 | 0 | 0 | 5,825 |
| 6 | LAXT Shaft Site Construction | 1/1/2015 | 15 | 7,272 | 0 | 0 | 7,281 | 7,272 | 0 | 0 | 7,278 |
| 7 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 8 | Offshore Tunnel | 7/1/2016 | 79 | 241,584 | 8 | 2 | 242,419 | 241,584 | 8 | 2 | 242,414 |
| 9 | SW Marine Shaft Site Construction | 7/1/2015 | 12 | 5,833 | 0 | 0 | 5,841 | 5,833 | 0 | 0 | 5,839 |
| 10 | SP Riser Cosntruction | 10/1/2019 | 24 | 3,132 | 0 | 0 | 3,166 | 3,132 | 0 | 0 | 3,166 |
| 11 | SP Diffuser Construction | 10/1/2021 | 12 | 4,415 | 0 | 0 | 4,430 | 4,415 | 0 | 0 | 4,427 |
| 12 | Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 496 | 0 | 0 | 503 | 496 | 0 | 0 | 503 |
| | Total | | | | | | 334,576 | | | | 334,558 |
| | Amortized Total | | | | | | 11,153 | | | | 11,152 |

## Appendix 6-A
# LOCAL TREE PROTECTION ORDINANCES

# Appendix 6-A
# LOCAL TREE PROTECTION ORDINANCES

## Introduction

This appendix provides information regarding local tree protection ordinances applicable to the Clearwater Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS). The environmental analysis conducted for terrestrial biological resources (Chapter 6 of the EIR/EIS) required the program and project be evaluated to determine compliance with local ordinances protecting biological resources, including local tree protection ordinances. The following is a summary of tree protection ordinances for the cities where program and/or project elements would be located. As discussed in Chapter 6, if any program elements conflict with these ordinances the Sanitation Districts will address such conflicts through project-level review and permitting. None of the project elements would conflict with these ordinances.

## City

### City of Walnut Oak and Walnut Tree Preservation Policy

The City regulates the preservation and removal of trees. The City's tree policy requires the preservation of all healthy trees unless compelling reasons justify the removal of such trees. This policy shall apply to the removal, pruning, cutting, and/or encroachment into the protected zone of the trees. The community development department shall have the primary and overall responsibility to administer, evaluate, and monitor this policy to assure strict compliance. Trees protected by the City include the genus *Quercus* including, but not limited to blue oak (*Quercus douglasii*), California black oak (*Quercus lobata*), California live oak (*Quercus agrifolia*), canyon oak (*Quercus chrysolepis*), interior live oak (*Quercus wislizeni*), scrub oak (*Quercus dumosa*), and California black walnut (*Juglans californica*).

The City of Walnut defines a heritage oak/walnut tree as any tree measuring forty inches or more in circumference or, in the case of a multiple trunk tree, two or more trunks measuring thirty inches or greater in circumference, measured three feet above the natural grade surrounding such tree. In addition, the planning commission and/or city council may classify a tree, regardless of size, as a heritage oak/walnut if it is determined by a majority vote thereof that such tree has exceptional historic, aesthetics and/or prominence in the community.

### City of Carson Tree Preservation and Protection Ordinance

The purpose of the City of Carson Tree Preservation and Protection Ordinance is to preserve and protect city parkway trees that are of aesthetic importance and to provide for the replacement of trees in order to maintain the community's natural environment. Trees are an important natural resource, and it is essential to the public peace, health, and welfare that such trees be protected from random removal, trimming, or damage. Tree is defined as any woody plant, including a palm, which has the potential of attaining a minimum height of 15 feet and has its canopy of foliage borne normally on a single trunk. Removal of a tree within the city parkway easement requires a permit.

## City of Cerritos Tree Ordinance

The City of Cerritos Tree Ordinance seeks to protect the "urban forest" character and park-like community. It prohibits "topping" of city trees and removal of street trees unless they are diseased, dead, or dying, or pose a threat to public health or safety. The ordinance also allows the City of Cerritos Property Preservation Commission to designate heritage trees with historical significance.

## City of Long Beach Tree Maintenance Policy

The City of Long Beach Tree Maintenance Policy recognizes the importance of trees and urban forestry and seeks to preserve trees for future generations. This policy applies to street trees located in the public rights-of-way. One aspect of the city's Tree Maintenance Policy provides rules for the removal of street trees to accommodate construction. Such removal requires a Permit to Remove Street Trees. The party removing the tree must replace it with one 15-gallon tree in an appropriate area of the parkway and also pay for one 15-gallon tree to be planted elsewhere in the city. The property owner must notify the City Council District Office and any formally recognized neighborhood associations in writing of the request to remove the tree and send a copy to the Department of Public Works. A posting will be placed at the tree by the City and all property owners within 300 feet of the tree will be issued 10-day notices. If the tree is within a designated historical area, the Neighborhood and Historic Preservation Office must also be notified.

## City of Los Angeles Protected Tree Relocation and Replacement Policy

Protected tree species include any of the following southern California native tree species that measure 4 inches or more in cumulative diameter 4.5 feet above the ground level at the base of the tree: southern California black walnut (*Juglans californica* var. *californica*), western sycamore (*Platanus racemosa*), California bay (*Umbellularia californica*), and oaks (*Quercus* sp.) indigenous to California but excluding the scrub oak (*Quercus dumosa*). No protected tree may be relocated or removed except as provided in the relocation and replacement policy or Article 6 of Chapter IV of the policy code. The term "removed" or "removal" includes any act that will cause a protected tree to die, including but not limited to acts that inflict damage upon the root system or other parts of the tree by fire, application of toxic substances, operation of equipment or machinery, or by changing the natural grade of land by excavation or filling the drip line area around the trunk.

## City of Pasadena Tree Protection Ordinance

In recognition of the significant aesthetic, environmental, and economic benefits to the community provided by trees, and to increase the tree canopy in Pasadena, the City Council adopted measures to protect public trees, landmark trees, native trees, and specimen trees in certain areas of the city. Public trees are those trees located on property under ownership or control of the city. A landmark tree is a tree designated under Chapter 2.75 (Cultural Heritage) because it is one of the largest or oldest species located in the city; it has a historic significance due to an association with a historic building, site, street, person, or event; or it is a defining landmark or significant outstanding feature of a neighborhood. A specimen tree is a tree of a species and size established on a list adopted by the city council and is thereby presumed to possess distinctive form, size, or age, and to be an outstanding specimen of a desirable species. There are 63 species listed on the specimen tree list. A native tree is a tree with a trunk size of more than 8 inches in diameter and is one of thirteen listed species.

## City of Pomona Tree Protection and Preservation Program

The City of Pomona has established the tree program to preserve and protect trees in historic districts. A certificate of appropriateness is required for removal or trimming of any character-defining landscaping on any historic site, unless there is an emergency. Character-defining landscaping includes mature significant trees, designated specimen (heritage) trees, and street trees. Heritage trees within the existing historic districts (Lincoln Park and Wilton Heights) are all trees currently designated by the city. In proposed historic districts, applicants are required to identify mature significant trees and specimen (heritage) trees as part of the application process. Specimen (heritage) trees can be located on public or private property and are defined consistent with City Council Resolution No. 73–68 as any rare or endangered species or any tree considered outstanding because of size, age, appearance, or relationship to a historic event. Mature significant trees can be located on public or private property and include oak trees with trunks more than 8 inches in diameter at breast height and other trees with trunks more than 10 inches in diameter at breast height, or multi-trunk trees with a total circumference of 38 inches or more at breast height. Street trees are any trees planted by the city on a city easement, parkway, or dedicated land. This does not include trees or landscaping planted by adjacent property owners. Minor projects requiring review under the Historic Preservation Ordinance include trimming of mature significant trees, trimming of specimen (heritage) trees, trimming of street trees not in compliance with the City of Pomona Street Tree Policy Manual or accepted standards and planting, and relocating trees on public property within a historic district. Major projects requiring review under the Historic Preservation Ordinance include removal of mature significant trees, removal of specimen (heritage) trees, and removal of street trees.

## City of San Gabriel Tree Preservation Program

In February of 1991, the San Gabriel City Council enacted a tree preservation ordinance to protect and preserve trees. The ordinance protects specific types of mature trees in an effort to ensure that the next generation of San Gabriel residents will reap the benefits of a mature urban forest. A permit is required to cut, trim, or remove a class 1 tree, a mature tree, and/or a landmark or historically significant trees or stand of trees.

## City of San Marino Tree Preservation Ordinance

This ordinance protects trees and shrubs in the R-1 and C-1 Zones of the City. This Section does not apply to trees in the Historical and Cultural Zone (H&C) and the Parks and Recreational Zone (P&R) or in the public parkways adjacent to the R-1 and C-1 Zones. The removal of any established tree on private property requires a permit. An established tree is defined as any variety of tree or shrub that is at least fifteen feet (15') in height and is twenty four inches (24") or more in circumference when measured at a point four feet six inches (4'6") above the natural grade, or if the tree or shrub has multiple trunks, the total circumference of each individual trunk at a point four feet six inches (4'6") above the natural grade is thirty six inches (36") or more.

# County

## Los Angeles County Oak Tree Ordinance

Portions of the project within unincorporated areas of Los Angeles County are subject to regulations under the Los Angeles County Oak Tree Ordinance. The Los Angeles County Oak Tree Ordinance has

been established to recognize oak trees as significant historical, aesthetic, and ecological resources. The goal of the ordinance is to create favorable conditions for the preservation and propagation of healthy oak trees.

Under the Los Angeles County Oak Tree Ordinance, a person should not cut, destroy, remove, relocate, inflict damage, or encroach into the protected zone of any tree of the oak tree genus that is 8 inches or more in diameter 4.5 feet above the mean natural grade without first obtaining a permit. In the case of oaks with multiple trunks, a permit is required if the combined diameter of the two largest trucks is 12 inches or more.

## Appendix 7-A

# CULTURAL RESOURCES EVALUATION OF THE SANITATION DISTRICTS OF LOS ANGELES COUNTY WHITE POINT OCEAN OUTFALL SYSTEM

# A CULTURAL RESOURCES EVALUATION OF THE SANITATION DISTRICTS OF LOS ANGELES COUNTY WHITES POINT OCEAN OUTFALL SYSTEM, OFFSHORE OF ROYAL PALMS BEACH, SAN PEDRO, LOS ANGELES COUNTY

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August 12, 2011

## NATIONAL ARCHAEOLOGICAL DATA BASE INFORMATION

| | |
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| ***Report Date:*** | August 12, 2011 |
| ***Report Title:*** | A Cultural Resources Evaluation of the Sanitation Districts of Los Angeles County Whites Point Ocean Outfall System, Offshore of Royal Palms Beach, San Pedro, Los Angeles County. |
| ***Prepared for:*** | Planning Section<br>Los Angeles County Sanitation Districts<br>1955 Workman Mill Road<br>Whittier, CA 90601 |
| **Contact:** | Steven Highter, Supervising Engineer |
| ***USGS Quadrangle:*** | San Pedro 7.5', California |
| ***Study Area:*** | Unsectioned, Township 5 South, Range 14 West, SBBM |
| ***Keywords:*** | Evaluation, Ocean Outfalls, Whites Point, Royal Palms Beach, San Pedro, Los Angeles County |

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## MANAGEMENT SUMMARY

At the request of the Sanitation Districts of Los Angeles County (Sanitation Districts), John Minch and Associates, Inc. (JMA) has undertaken a cultural resources evaluation of the Sanitation Districts' Whites Point Ocean Outfall System. The outfalls comprise four reinforced concrete pipes of varying diameters and lengths that convey treated effluent into the Pacific Ocean. The outfalls are located immediately offshore of Royal Palms Beach, below Whites Point on the Palos Verdes Peninsula in San Pedro. Three of the pipelines are over 50 years of age; the fourth is 45 years old. This evaluation is unique in that all four outfalls are underwater and access to the outfalls is difficult. Consequently, no field surveys were conducted in conjunction with this evaluation.

The purpose of this study was to identify all potentially significant cultural resources situated within the boundaries of the Area of Potential Effects (APE). This information is needed since adoption of the proposed rehabilitation plan could result in adverse effects upon locations of archaeological or historical importance.

The results of the records search conducted at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton indicated that no prehistoric or historic archaeological sites have been recorded within the boundaries of the APE. Research has indicated that portions of the APE have been previously disturbed during construction of the outfalls. A review of a shipwreck data base search conducted independently of this evaluation has indicated that three shipwrecks lie near the APE. However, it is anticipated that none of the three will be impacted by the proposed undertaking.

Application of both National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) criteria resulted in the opinion that none of the outfalls appear significant at the federal, state or local levels. Therefore, no further work in conjunction with cultural resources is recommended or warranted. As a matter of course, the outfalls have been recorded on the appropriate DPR 523 series forms and submitted to the SCCIC at California State University, Fullerton for assignment of a Primary Number.

## I. INTRODUCTION

The following report was prepared for the Sanitation Districts by JMA. It describes the results of a cultural resources evaluation of the Sanitation Districts' Whites Point Ocean Outfall System located offshore of Royal Palms Beach in San Pedro, Los Angeles County (figs. 1 and 2). Presently, the Sanitation Districts plans to rehabilitate the existing outfall pipes that are used to discharge secondary treated wastewater offshore. The technical report is a component to the environmental impact report/environmental impact statement (EIR/EIS) for the Clearwater Program Master Facilities Plan.

In compliance with the National Environmental Policy Act (NEPA) of 1969, 40 CFR 1508.22, and 33 CFR Parts 230 and 325, and in conjunction with the Sanitation Districts, the U.S. Army Corps of Engineers (CoE) will be preparing the associated EIS for the project (Federal Register 2008). The joint EIR/EIS will be used to identify potential impacts associated with the proposed rehabilitation project. Therefore, this document is written in compliance with: (1) Section 106 of the National Historic Preservation Act of 1966 (NHPA) as amended, which includes criteria for eligibility to the NRHP; and (2) the California Environmental Quality Act (CEQA), as amended in 1992, which includes criteria for eligibility to the CRHR. The report format has been prepared according to the *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* contained within the State's Preservation Planning Bulletin Number 4(a) (California Department of Parks and Recreation 1989).

The purpose of this study is to identify all historic resources within the APE and to determine whether the proposed undertaking will have an effect on such properties. "Historic properties" include prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior (36 CFR 800.16(1)). According to 36 CFR 800.2(d), the APE is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."

Our assessment consisted of: (1) a comprehensive records search conducted at the SCCIC at California State University, Fullerton to determine whether any previously recorded historic or prehistoric material is located on or adjacent to the APE (existing offshore ocean outfall alignments), (2) a review of shipwreck database information, (3) extensive literature review, and (4) archival research including historical records, technical engineering data, and period photographs. In

addition, scoping was conducted with the Native American Heritage Commission (NAHC) in Sacramento and local Native Americans. As the whole of the outfall lies underwater, no cultural resource surveys were undertaken in conjunction with the evaluation.

## II. SETTING

### A. Location

The coastal landmark historically known as Whites Point has been labeled on various maps and listed in several texts as Whites Point, White's Point, or White Point. The different spellings will appear throughout the text where applicable. The study area or APE is situated off the Los Angeles County coast near Whites Point. The Palos Verdes Hills lie to northwest as does the Upper Reservation of Fort MacArthur and the urban core of San Pedro to the northeast. Additionally, Point Fermin lies approximately 1/2-mile to the east as does Portuguese Bend 3-miles to the west (fig 1). More specifically, the APE is located immediately offshore from Royal Palms Beach which lies below and just southwest of White Point Bluff Park in San Pedro. Legally, the area containing the outfalls is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian as shown on a portion of the *San Pedro* 7.5' USGS Topographic Quadrangle (fig. 2).

### B. General Prehistory of Southern California

Most scholars believe that sea level was considerably lower at the end of the last ice age (the "Pleistocene") than it is today. Traditional scholars hold that at that time, a "bridge" of land, which corresponded to the modern Aleutian Island chain, connected northeastern Asia with Alaska. It is generally believed that the earliest human inhabitants of southern California were descendants of hunters who had crossed this bridge following big game such as mastadon.

On the other hand, recent archaeological evidence from San Clemente Island suggests that prehistoric man was fishing on the island as early as 10,000 or more years ago (Big Dog Cave; Salls 1990:39). Since San Clemente has always been an island, even at the end of the last ice age, humans would have needed boats to reach that location. If they had boats at such an early date, they would not have needed a "land bridge" to reach Alaska from Asia.

**Figure 1**. Regional location of the project area as indicated on a portion of the *Long Beach* USGS 1:100,000 scale Topographic Map.

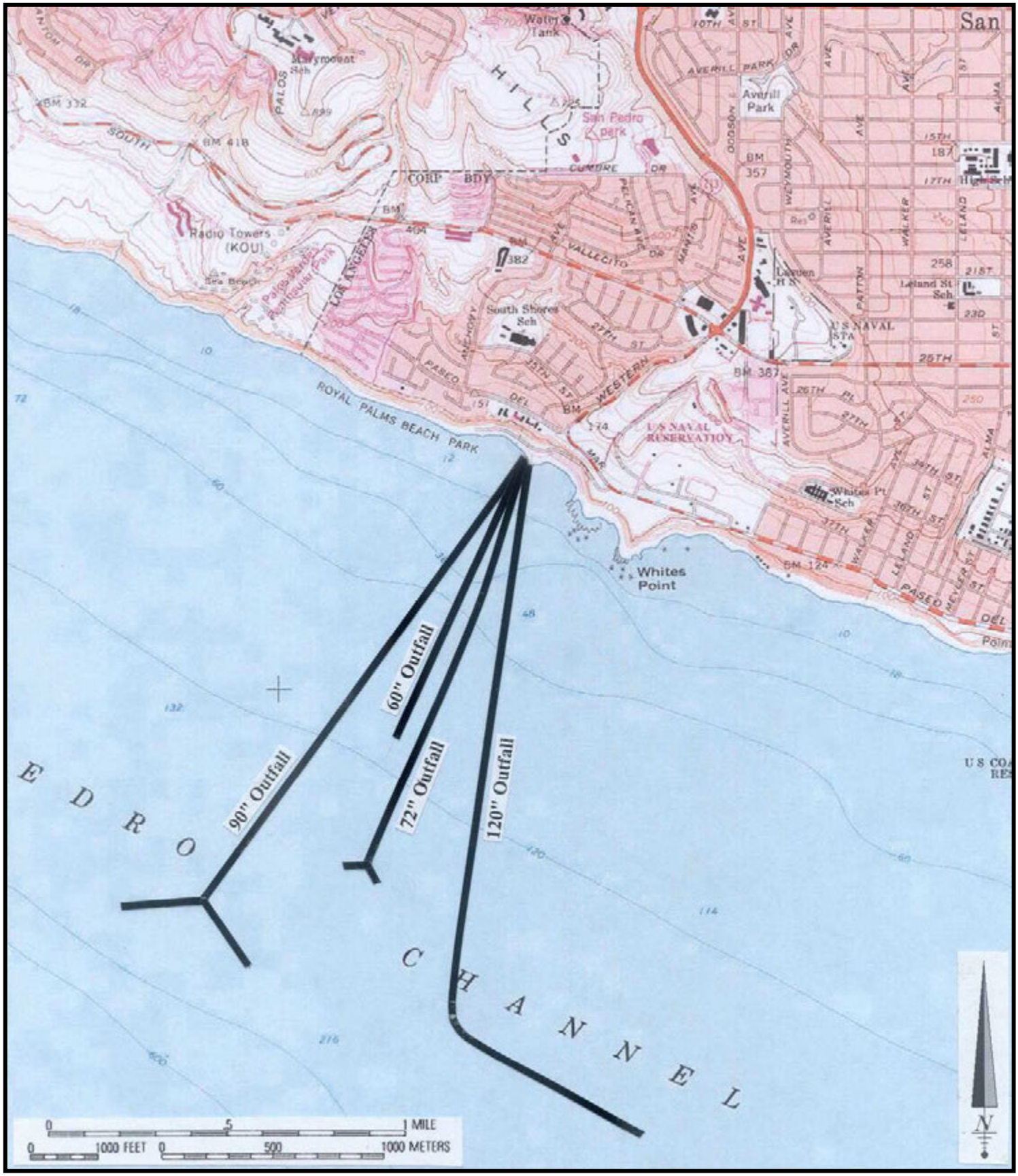


**Figure 2**. Sanitation Districts' Whites Point Ocean Outfall System as shown on a portion of the *San Pedro* 7.5' USGS Topographic Quadrangle.

Southern California in general has had a relatively long chronology of human habitation based on such dates as the 23,000 B.P. (Before Present) age for "Los Angeles Man" and the 9,000 ±80 B.P. date for the La Brea Woman Skeleton (Moratto 1984). Some archaeologists have referred to this time period, especially its later Post-Pleistocene era (i.e. after 11,000 B.P.) as the "Archaic Period" (e.g. Wallace 1978). Most archaeologists in California assume that ancient populations during that time period underwent economic changes from small communities based on hunting to food collecting societies (cf. Chartkoff and Chartkoff 1984; Moratto 1984).

The pioneering research of Wallace (1955), Warren (1968) and others shows that the Early Systems Period (or Early Period) was apparently followed by several stages of cultural development, including what they termed the "Millingstone Period" (7,000 to 1,500 B.C.). There are site data which seem to indicate that there was a shift from hunting economies to those that emphasized seed collecting. The emphasis on food collecting and harvesting of wild seeds, as opposed to hunting, is evidenced by the apparent abundance of millingstones or "metates" and hand stones or mullers called "manos"and a relative absence of projectile points at sites dating to this period. These implements were used to grind seeds into flour. Stickel has characterized the economy during the Millingstone Period as follows:

> The people of the Milling Stone Period were primarily plant food collectors (as evidenced by the manos and metates); hunting and fishing were secondary activities. The ecology of these people was not only oriented to collecting seeds, such as seeds of sages, but also to collecting shellfish. Hunting and fishing seem to have been less important, as evidenced by the few projectile points [i.e. spear or dart points] and fish and mammal bones. (Stickel 1978:7).

Most habitation sites seem to have been small hamlets or villages, but some coastal settlements increased in size over time and by the end of the period some coastal villages may have had populations of several hundred people. The "Intermediate Period" (1,500 B.C. to A.D. 500) saw the development of more broad based economies exploiting both marine resources along the coast (e.g. sea mammal, fish and shellfish) and terrestrial resources, including plant foods such as the acorn crop being emphasized. Corresponding to the exploitation of the acorn crop was the introduction of the mortar and pestle complex as food processors for the acorns and other hard seed

crops. Up until this time, the technology to leach the acrid tannic acid from acorns was unknown. Thus, the nuts had been inedible. It would be difficult to over-emphasize the importance of the introduction of acorn technology since this event opened the door to gathering of a foodstuff which was more versatile, abundant, and reliable than any known before.

Arrowheads first appear in Los Angeles County at the end of the Intermediate Period (circa A.D. 500; Heizer and Hester 1978). This event is believed to have facilitated the ability to hunt. Thus, great inroads into problems of food gathering were made during the Intermediate period, setting the stage for the floruit of California Indian culture which was to occur in the Late Prehistoric period.

Although the point is controversial, there is some reason to believe that Los Angeles County witnessed a large influx of desert peoples at the outset of the Late Prehistoric era about 1500 years ago (Kroeber 1925). These people, who spoke a Shoshonean dialect, rapidly assimilated the native population. It was the Shoshoneans who were the ancestors of the "Gabrieliño" people whom the mission padres found occupying Los Angeles County at the end of the 18th century.

The “Late Prehistoric Period” is thought to have dated between A.D. 500-1769. This period was one of expanding population accompanied by the growth of relatively complex social and political institutions. Archaeological sites of the Late Prehistoric Horizon are characterized by a great wealth of finds in comparison to sites representing earlier cultures. Finds include many finely flaked arrowheads of various styles, ground stone bowls, gamestones, smoking pipes, beads and pendants, and, rarely, model canoes and carved figurines in addition to most of the types of materials known from the earlier peoples. All indications are that the Late Prehistoric peoples were capable of exploiting natural resources more comfortably and efficiently than any of southern California's earlier occupants.

C. Culture History of the Gabrieliño

When Juan Cabrillo sailed the coast of California in 1542, Los Angeles and most of Orange County were inhabited by prehistoric people who occupied scattered villages. Although these people had no political institutions beyond the village level, they spoke a common dialect, and when the Mission San Gabriel was established, came to be known to the Spanish as “Gabrieliño.”

Linguistic and archaeological evidence strongly suggest that the Gabrieliño represented a branch of desert dwellers, or Shoshoneans, who moved to coastal southern California during the first

millennium A.D. At that time, they supplanted or absorbed an earlier group about which relatively little is known.

The Gabrieliño were a stone-age people whose subsistence was based upon hunting and gathering. They did not know metallurgy nor did they practice agriculture. Yet, the population was relatively small, few villages comprising more than 100 souls, and agriculture was unnecessary. The staple food was acorns which normally grew in such abundance that there were more than enough to go around. The acorn meats were leached, dried, and ground into flour which could be used to make a great variety of dishes. Small animals, principally rodents and rabbits, furnished much of the protein. However, deer were also hunted. Marine fishes and shellfish were very important in the diets of coastal inhabitants.

Technology comprised principally manufacture of tools and containers from stone, bone, leather, and plant fiber. Most implements requiring a hard, sharp edge were manufactured from chipped stone. These included such items as arrow points, knives, scrapers, and so forth. Implements for milling, such as manos, metates, mortars and pestles were made from ground stone. Traditional containers consisted of finely woven baskets which were lined with tar when water-proofing was required. Pottery was also known during the final centuries of Gabrieliño prehistory although it seems that baskets never lost their prominent role in daily lives.

The Gabrieliño lived in villages ranging in size from only an extended family or two up to several hundred people. Houses consisted of thatch huts built over sunken earthen floors. Aside from dwellings, villages also had sweathouses which were used daily by the men and seem to have represented important male social centers. Political and social organization was based on groupings called moieties, one practical function of which was to prevent family intra-marriage. Leadership at the larger villages seems to have consisted of a chief, whose position was hereditary, and one or more shamans who tended to religious and medical affairs.

Relatively little is know about traditional Gabrieliño religion which may have been fundamentally pantheistic. However, very late in time, perhaps after contact with the Spanish, a deity called *Chinigchinich* appeared. Most of what we know about the *Chinigchinich* cult was recorded by Padre Boscana of the Mission San Juan Capistrano. Evidence indicates that *Chinigchinich* was an omnipotent, omnipresent deity who superseded all others. Thus, the latest Gabrieliño religion was fundamentally monotheistic.

It was the intent of the Spanish government to convert the Gabrieliño to Christianity and the padres met with a great deal of success in their early efforts. Many Gabrieliño voluntarily moved to the mission where they were taught farming and received rudimentary education in European technology. Unfortunately, the Spanish efforts soon led to some devastating side effects, the most well-known of which was the spread of European diseases to which the Gabrieliño had no hereditary immunity.

The missionaries lost control when California was secularized under Mexican rule and the surviving Gabrieliño found themselves immersed in a competitive economy in which they were ill-equipped to compete. Many became virtual slaves while others worked on ranches where they lost touch with their traditional culture.

When the Bureau of Indian Affairs compiled its role of Mission Indians in 1929, only four individuals claimed to be full-blooded Gabrieliño and only about thirty listed themselves as at least one-half Gabrieliño. The reader is referred to the works of Kroeber (1925), Johnston (1962), Heizer (1968), Bean and Smith (1978), and LaLone (1980) for more in-depth information on the Gabrieliño.

D. History of the Palos Verdes Peninsula

The first European to set eyes on the shores of the Palos Verdes Peninsula was Juan Rodríguez Cabrillo in 1542. At the request of the viceroy of Mexico, Cabrillo was sent to explore the coast of New Spain and to find the elusive Strait of Anian. In conjunction with his historic voyage, Cabrillo sailed into San Pedro Bay (Los Angeles Harbor) and skirted the peninsula as he headed north along the coast. Sixty years later, a similar expedition of the California coast was conducted by Sebastian Viscaino while exploring Alta California for safe harbors (Hoover *et al.* 1966).

The Palos Verdes Peninsula was once a part of the 75,000 acre Rancho San Pedro. It was one of the oldest of the eight hundred land grants made by the Spanish in the early days of California. Grazing rights to the rancho were granted to Juan José Domínguez by Pedro Fages (Spanish governor of Alta California) in 1784 (Gillingham 1961). It included the present day cities of Redondo, Torrance, Compton, Gardena, Lomita, Harbor City, San Pedro, Wilmington, the western portion of Long Beach, and Palos Verdes (Fink 1966).

In 1827, the Rancho de los Palos Verdes (Rancho of the Green Trees) was carved out of the Rancho San Pedro and placed under the control of José Dolores Sepúlveda (Robinson 1939:20f.).

It included land extending from south of Redondo Beach to San Pedro. However, title to the peninsula portion of the grant was clouded from the very beginning by bitter disputes between the Domínguez and Sepúlveda families (for more details see Thacker 1923).

In 1841, Governor Alvardo upheld the Sepúlvedas claims to the land and issued a new decree. This action resulted in the Domínguez family transferring ownership of 31,626 acres comprising the Rancho de los Palos Verdes to the Sepúlvedas (Gillingham 1961:166). Governor Pio Pico finalized the matter in 1846 and issued José and Juan Sepúlveda a grant to the Rancho de los Palos Verdes (Robinson 1939:22f.). The land continued to be used primarily for cattle grazing.

Although a land patent for the Rancho de los Palos Verdes had been issued to the Sepúvedas in 1882 by the U.S. government, various individuals had absorbed the vast majority of the original lands. One of these individuals was Jotham Bixby who began buying into the rancho as early as 1872. By 1882, at the time of the patent and the partition, Bixby owned 17,031.91 acres of which the subject property was once a part. In 1913, the Bixby family sold all but 1,000 acres of what is today Harbor City to Walter Fundenburg. However, Fundenburg was unable to raise sufficient funds for the purchase which forced the Bixby family to foreclose on the mortgage. After considerable litigation, it was ruled that the acting real estate firm of Schader and Adams had 90 days to find a buyer for the property (Fink 1966:107f.).

E. Whites Point Area

Today, the bluff and beach area known as Whites Point is occupied by both White Point Bluff Park and Royal Palms Beach. North of Paseo del Mar, the general location also includes the 102-acre White Point Nature Preserve. This is the former site of the 1950s Whites Point Nike Missile site. Remnants of the military installation (headquartered at Fort MacArthur) can still be seen today.

Originally part of José Sepúlveda's Rancho de los Palos Verdes, the name "White Point" occurred in lease agreements signed around the turn of the 20th century by then owner, Ramón D. Sepúlveda (son of José Diego Sepúlveda). In addition to Japanese immigrants farming his White Point land, Ramón leased beachfront property to several Japanese-American fishermen for the purpose of establishing abalone fisheries. They lived on the shore at White Point in structures built by Sepúlveda. As the fisheries began to thrive, a cannery was opened. However, the business was short lived. In less than a decade, abalone beds had been over-fished and new restrictive laws

resulted in a decline of the industry. Therefore, the abalone operation closed (Gnerre 2010; Palisades Residents Association 2011).

It was the discovery of sulfur hot springs at the base of the bluffs that brought Ramón Sepúlveda and Tamiji Tagami together as partners in the development of a spa (bathhouse) at White Point about 1917. After exposing the hot springs and constructing roads, a resort (complete with hotel, restaurant, cabins, saltwater swimming pools and enclosed boating area) was built. The resort was especially popular with Japanese-American. Several years later in 1933, the Long Beach earthquake sealed off the sulphur springs and the resort suffered heavy damage. Unable to recover from the disaster, the resort was forced to close. Today, remains of concrete walls from the resort can still be seen (Gnerre 2010; Megowan 2010; Waugh 1988).

## III. DEVELOPMENT OF THE APE

The APE for the ocean outfall evaluation was defined by Laura S. White, M.A., an RPA certified archaeologist (see Appendix A). The APE boundary is configured to include only those portions of the 72-inch, 90-inch, and 120-inch outfalls subject to rehabilitation (fig. 3). The APE comprises the following:

1. 72-inch outfall - 8.5 feet on either side of the outfall for a total area of approximately 49,980 sq. ft.

2. 90-inch outfall - 9.6 feet on either side of the outfall for a total area of approximately 69,590 sq. ft.

3. 120-inch outfall - 11.5 feet on either side of the outfall for a total area of approximately 31,120 sq. ft. (Haug 2011:pers. comm).

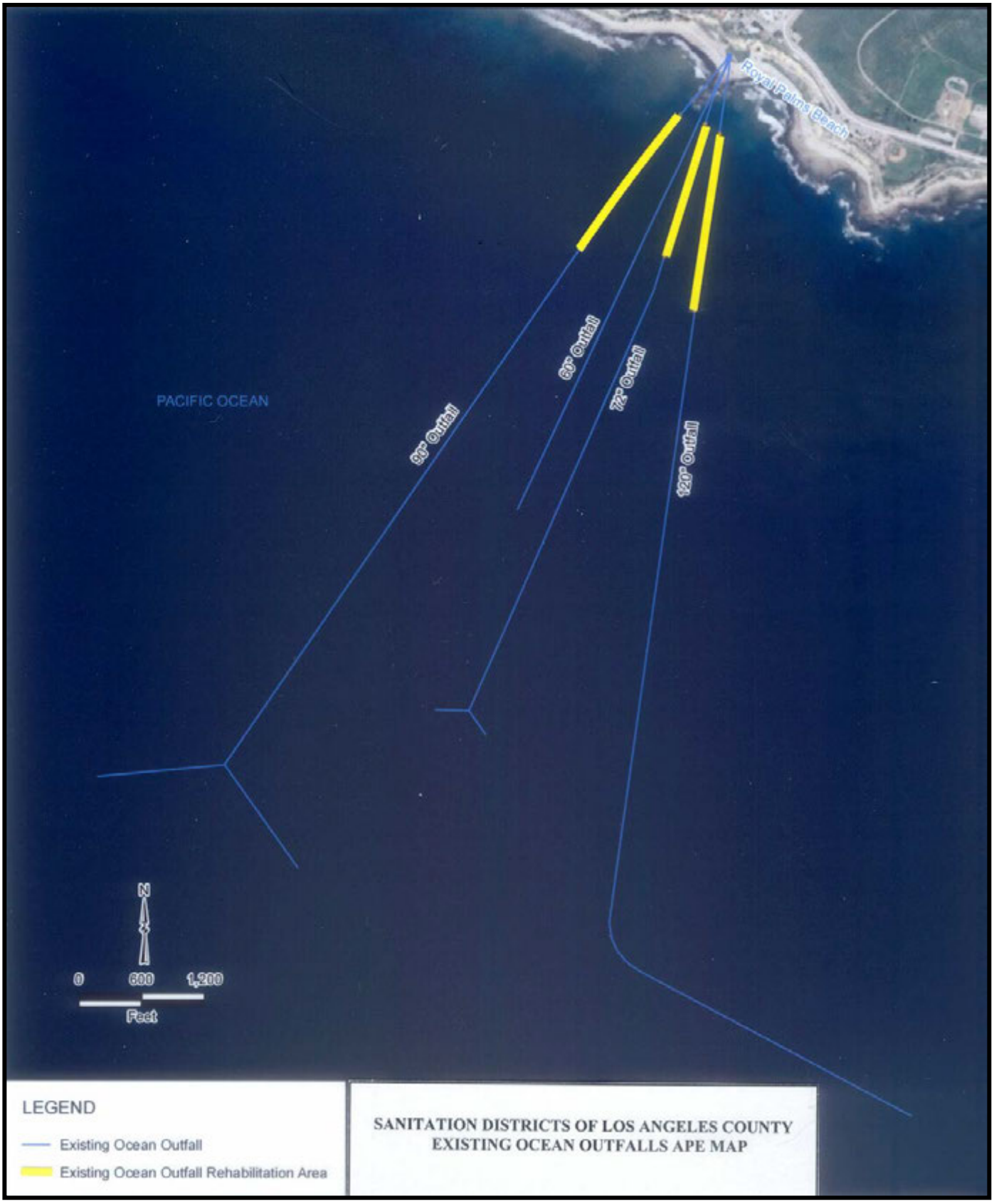


**Figure 3**. APE boundary map.

## IV. JOINT OUTFALL SYSTEM OVERVIEW

### A. Introduction

The Sanitation Districts consist of 23 independent special districts which together serve the wastewater and solid waste management needs of the approximately 5.5 million people residing in Los Angeles County. The 23 separate districts work collectively under a Joint Administration Agreement. Seventeen of the districts located in the metropolitan area of Los Angeles participate in the Joint Outfall Agreement, which provides for combined investment in wastewater conveyance and treatment facilities. Collectively, these districts (known as the Joint Outfall Districts), provide for operation and maintenance of a regional, interconnect system of facilities called the Joint Outfall System (JOS). The JOS service area includes 73 cities located within the Sanitation Districts service area. In addition, it encompasses some unincorporated areas as well as parts of the City of Los Angeles (LACSD 2008).

The JOS operates seven wastewater treatment plants. The Joint Water Pollution Control Plant (JWPCP) in Carson, which has a permitted capacity of 400 million gallons per day (MGD), is the largest of the JOS wastewater treatment plants and treats approximately 300 MGD (Dubnewych *et al.* 2007). The JWPCP facility provides secondary treatment and disinfection to all influent wastewater. The effluent, or treated wastewater, is then conveyed from the plant through two, 6-mile tunnels to Royal Palms Beach. Here a subterranean manifold structure (reinforced concrete vault) directs the effluent to the ocean outfalls for disposal into the Pacific Ocean.

### B. The Ocean Outfalls

The Sanitation Districts operate and maintains four ocean outfalls off the Whites Point shoreline in San Pedro (pl. I:top & pl. II:bottom). They comprise: (1) a 60-inch diameter pipe constructed in 1937, (2) a 72-inch diameter pipe constructed in 1947, extended in 1953, (3) a 90-inch diameter pipe constructed in 1957, and (4) a 120-inch diameter pipe constructed in 1966 (LACSD 1995; Parkhurst, Haug, and Whitt 1967). The two continuous outfalls are the 90- and 120-inch diameter outfalls. The other two outfalls (60- and 72-inch) are used to provide additional hydraulic capacity during periods of heavy flows. In January of 1995, a severe storm in the southern portion Los Angeles County resulted in the outfall system reaching its maximum hydraulic capacity (Dubnewych *et al.* 2007).

Each of the ocean outfalls extend seaward from a subterranean manifold located at Royal Palms Beach (Pl. I:bottom & Pl. III: top). According to the Sanitation Districts Clearwater Program Overview:

> Approximately 1,400 feet seaward, the ocean outfalls change from underground pipelines to seafloor pipelines...The effluent is discharged through diffusers (i.e., the section of the outfall pipelines containing open portholes) up to one and a half miles offshore at a depth of about 200 feet below sea level.
>
> The 72-inch outfall was modified/extended in 1953, including removal of the original diffusers and adding new diffusers/ports at the end of the extension in a "Y" configuration. The 60-inch outfall was modified/extended in 1954, including removal of the original diffusers and coring new ports in the original outfall pipe. The 90-inch outfall was re-ballasted in 1997, and the 72-inch, 90-inch, and 120-inch outfalls were re-ballasted in 1999 (Sanitation Districts 2011).

A more detailed description of each outfall is presented in the section below.

**1. 60-inch Diameter Ocean Outfall (1937)**

This outfall is used for standby capacity to provide additional hydraulic relief during high flow conditions. When used, it discharges off the Whites Point shoreline between the 90-inch and 72-inch diameter ocean outfalls at about 110 feet below the ocean surface. The outfall is approximately 5,000 feet long, which includes the approximate 400 foot long diffuser (Haug 2011:pers. comm.).

**2. 72-inch Diameter Ocean Outfall (1947)**

This outfall is used for standby capacity to provide additional hydraulic relief during high flow conditions. When used, it discharges off the Whites Point shoreline between the 60-inch and the 120-inch diameter ocean outfalls. The outfall is approximately 6,480 feet long with a Y-shaped diffuser section. The diffuser section contains two 225-foot long legs. The outfall discharges at a depth of approximately 160 feet (ibid.)

**3. 90-inch Diameter Ocean Outfall (1957)**

During normal flow conditions, this outfall routinely discharges approximately 35% of the effluent from the JWPCP. It discharges southwest of the shoreline off Whites Point, San Pedro. The outfall is 7,982 feet long to the beginning of a Y-shaped diffuser with two legs. Each leg is 1,208 feet long. The depth at the beginning of the diffusers is 196 feet and 210 feet at the end of the diffuser (from Table 5- California Regional Water Quality Control Board 2011).

**4. 120-inch Diameter Ocean Outfall (1966)**

During normal flow conditions, the outfall routinely discharges approximately 65% of the effluent from the JWPCP. It discharges south of the shoreline off Whites Point, San Pedro. The outfall is 7,440 feet long to the beginning of a single L-shaped diffuser leg which is 4,440 feet long. The depth at the beginning of the diffuser is 167 feet and 190 feet at the end of the diffuser (ibid).

C. Proposed Outfall Rehabilitation Program

Rehabilitation of the outfalls would entail joint repair and re-ballasting with rock to ensure that each of the outfalls remain connected and in place. Per the Sanitation Districts Clearwater Program Overview:

> The re-ballasting work would occur on the existing 72-, 90-, and 120-inch outfalls in water depths ranging from approximately 20-50 feet. A small derrick barge would be used to place the ballast rock around the outfalls and support the joint repair work. Joint repairs would involve temporarily removing some of the existing ballast rock from around the outfall to fully expose the joint being repaired. A coupling, which is a giant clamp that wraps around the joint, would be installed and the annular space filled with concrete. The existing ballast rock would be replaced around the pipe (Sanitation Districts 2011).

Scarification of the sea bed beneath the pipelines due to ocean currents and other currents induced by effluent rising to the ocean surface can contribute to settling of the pipe sections leading to breeches in the joints (Rawn and Bowerman 1950:190). One unanticipated action that resulted in damaging the 60 and 72-inch outfalls entailed U.S. Army personnel "...exploding obsolete ammunition over and near the outfall as a means of securing fish" (Rawn 1965:96, Haug 2011:pers.

comm).

D. Design and Construction

The design and construction of all four outfalls is similar in nature. The sections consist of reinforced concrete pipes, 8 and 24 feet in length. They are all prefabricated from concrete placed over iron forms (Pl. III). The pipes were placed on the sea floor using a floating crane (Pl. IV). The pipe sections have gasketed bell and spigot joints. The 60-inch and 72-inch outfalls have a lead packing gasket in each joint. The 90-inch outfall has both a lead packing and rubber gasket. The 120-inch outfall joints have neoprene gaskets (ibid.).

Pipe sections within the breaker line are placed in shallow trenches that were excavated using explosive charges. This portion of each outfall is thoroughly ballasted with rock. Outside the breaker line, the pipe sections lie upon the sea floor.

## V. RESEARCH DESIGN

A. Introduction

As the whole of the APE lies underwater, and no field studies were conducted in conjunction with the evaluation, little if any potential exists within the APE for the discovery of prehistoric resources. The history of the Palos Verdes Peninsula was drawn from Gillingham's *The Rancho San Pedro* (1961) and Fink's *Time and the Terraced Land* (1966).

B. Research Goals

The goals of our research were to identify known locations of potential significance resources situated within the APE. Our hypotheses were as follows:

(1) Although not unknown along the coast of southern California, prehistoric sites have a low potential for occurring underwater. None have been previously documented within the APE or surrounding underwater area. Both the beach and the sea floor have been previously disturbed during construction of the outfalls.

(2) Terrestrial sites in the region are connected with early (Mexican Period) ranching as well as late 19$^{th}$ and early 20$^{th}$ century Japanese farming. Offshore there are shipwrecks within the APE and the sewer outfalls.

## VI. METHODS

A. Archaeological Records Search

An in-person records search of the APE was conducted by Ms. Laura S. White at the SCCIC at California State University, Fullerton. The search entailed a review of all previously recorded prehistoric and historic archaeological sites situated on or within a one-mile radius of the project area. Additionally, the NRHP, California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the California Directory of Properties (DOP, aka the Historic Resources Inventory [HRI]) were reviewed for the purpose of identifying historic properties (see Appendix B).

### 1. Previously Recorded Archaeological Sites Within the APE

The results of the records search indicated that no prehistoric or historic archaeological sites have been previously recorded within the boundaries of the APE.

### 2. Previously Recorded Archaeological Sites Within a One-Mile Radius

Outside the APE, 14 archaeological sites (12 prehistoric, 2 historic) have been recorded within a one-mile radius of the outfalls. The vast majority of these prehistoric sites comprise lithic and shell scatters. Each site is listed and characterized in Table 1 by their official state recording # (Primary # 19-xxxxxx) followed by the corresponding County site trinomial (CA-LAN-xxxx).

Of the 14 sites, Primary #19-002211/LAN-2211 is the closest to the APE. It lies approximately 350 feet atop the vertical cliff in White Point Bluff Park. The site comprises the former location of a restaurant associated with the White Point resort which operated from the 1920s until WWII.

Phase II testing of LAN-2211 was conducted by James Brock of Archaeological Advisory Group in 1994. The test program included surface collection as well as the excavation of postholes and three (3) test units. Artifacts recovered included thousands of glass fragments representing primarily bottles but also some glassware and ceramics (terra-cotta flower pot, vitreous creamery, porcelain sherds, as well as earthenware sherds). Other finds included miscellaneous metal fragments and construction material. A concrete pad with a fountain also lies within the boundaries of the site.

**Table 1. Cultural Resources Located Within a One-Mile Radius of the APE**.

| Primary # 19-/ LAN- | Site Description |
|---|---|
| 19-000105/LAN-105 | Artifact area including a large mortar and pestle. Site recorded by F.H. Racer in 1939. Information presented in 1939 manuscript by F.H. Racer entitled "Indian Camp Sites in the Harbor District". Site revisited in 1980 by M. Boxt and S. Dahan and described as a scatter of lithic artifacts and shell remains comprising a mano, chert core, ten banded and non-banded chert waste flakes, fire-cracked rock, abalone, clam, mussel and oyster shells. Mayor portion of site covered by baseball field, paved road, and 2 parking lots. Site tested by Westec Services (Cooley et al. 1986a). |
| 19-000109/LAN-109 | Unknown site recorded by H. Eberhart in 1952 based on information from D.L. True. |
| 19-000142/LAN-142 | A deposit (refuse heap)on side of a creek. Material observed included stone artifacts, shell and animal bone. Site recorded by N.C. Nelson (1912a) and later tested by Westec Services (Cooley et al. 1986b). |
| 19-000143/LAN-143 | Site described as "traces of a campsite" composed of fragments of obsidian and quartz amongst marine shell. Site recorded by N.C. Nelson (1912b). |
| 19-000145/LAN-152 | A deposit (refuse heap) located on opposite side of creek from LAN-142. Site recorded by N.C. Nelson (1912c) and tested by Westec Services (Cooley et al. 1986b). |
| 19-000291/LAN-291 | Village or campsite area with midden and some shell. Cultural material observed included blades, scrapers, worked fragments of steatite, etc. Steatite whale effigies reportedly found here. Site recorded by D.L. True (1960) and subsequently tested by Westec Service (Cooley et al. 1986a). |
| 19-000849/LAN-849 | Lithic scatter (approx. 50 x 100 m.) comprising flakes and cores of local chert. Some chalcedony flakes, one chalcedony scraper. Possible sandstone pigment grinding bowl. No marine shell. Site recorded by Whitley/Ivie in 1976 and later tested by Singer et al. in 1994. |
| 19-000850/LAN-850 | Large shell midden measuring approximately 250 m. in diameter. Site recorded by Whitley/Ivie in 1976. Site test excavated by Singer et al. in 1994. |
| 19-001144/LAN-1144 | Lithic and shell scatter (200 x 110 m) consisting of chert debitage, chalcedony and fused shale. Marine shell includes chione, haliotis, and mytilus. Site recorded by E. Weil et al. 1984 and later tested by Westec (Cooley et al. 1986b). |

| | |
|---|---|
| 19-001269/LAN-1269 | One or more temporary camps measuring 190 x 170 m. Surface material consists of marine shell. Subsurface material includes flaked lithic tools, tool production debris, animal bone and marine shell. Site recorded by H. Eberhart and W. Wasson in 1974. Test excavated by Westec Services in 1986 (Cooley et al. 1986a). |
| 19-001522/LAN-1522 | Lithic scatter (120 x 100 m.) comprising 25+ chert and chalcedony flakes, a core, and angular wastes. Site recorded by P. Jertberg in 1988. Site revisited by R. Bissell in 1989. |
| 19-002211/LAN-2211/H | Former location of a restaurant associated with the White Point Resort. It operated from the 1920s until WWII when the property was taken over by the U.S. military for defensive purposes at which point the restaurant was demolished. Site recorded by J. Brock in 1994. |
| 19-120002 | Three (ship to shore) radio towers estimated to date to the late 1950s. Site recorded by B. MacDougall 1985. |
| 19-120003 | Temporary camp(s) comprising sparse scatter of marine shell. No artifacts observed. Site recorded by H. Eberhart and W. Wasson in 1974. Site was subsequently tested by Westec Services in 1986 and found to be significantly disturbed by both cut and fill. A few pieces of lithic material were evident but minimal and thought to be from a secondary deposit (Cooley et al. 1986). |

**3. Heritage Properties**

No NRHP, CRHR, CHL, or CPHI listed properties have been recorded within the boundaries of the APE. However, one CRHR listed district has been identified within a one-mile radius. It comprises the Whites Point Nike Launcher Area Missile Site 43L Historic District identified as Primary # 19-186694D. The District, covering approximately 142 acres at Whites Point in San Pedro, was formerly an extensive military installation with headquarters at Fort MacArthur. On August 11, 2000, the District was listed as a CRHR by the State Historical Resources Commission (Schechter 2000). It was determined significant under criterion 1 for its association with events that made a significant contribution to local, state, and national military and cultural history between 1956 and 1975. The District is made up of several buildings and structures. Each of these resources is identified in Table 2.

The DOP lists one building within a one-mile radius of the APE that has been evaluated for historical significance. The building includes the Good Shepherd Lutheran Church constructed between 1954 and1955 at 1350 West 25$^{th}$ Street in San Pedro. Two other buildings located on the property include the Pastorage (built in 1957) and the Sunday school annex (constructed in 1968).

The property was evaluated for historical/architectural significance by Galvin & Associates in 2005 (Taniguchi 2005). The church was assigned a NR status code of 6Y (Determined ineligible for NR by consensus through Section 106 process).

**4. Previous Surveys**

The results of the search indicated that the APE has not been previously surveyed for cultural resources. However, outside the project area, a minimum of 34 archaeological investigations (including survey and excavation reports) have been conducted within a one-mile radius of the APE. These studies include cellular phone sites and both small (less than 40) and large (40 or more) acreage surveys.

The largest investigation conducted within a one-mile radius of the APE was performed by RMW Paleo Associates, Inc. in 1989. The study included a 455-acre survey of a portion of the Palos Verdes Hills situated approximately 3/4-miles to the northwest of the APE. The investigation resulted in the discovery of two archaeological sites (Bissell 1989).

**Table 2. Individual District Resources Included Within the Whites Point Nike Launcher Area Missile Site 43L Historic District**.

| Primary Number (19-) | Site Description |
|---|---|
| 19-186695 | 1950 Tank Repair Building (destroyed, only floor remains; Military Bldg. # 1008). |
| 19-186696 | 1954 Nike-Ajax Liquid Propellant Storage Shed (Military Bldg. # 1018). |
| 19-186697 | 1954 Underground Missile Storage Magazines (Military Bldgs. # 1019 and 1020). |
| 19-186698 | 1954 Generator Building (removed; Military Bldg. # 1021). |
| 19-186699 | 1961 Sentry Station (Exclusion Area; Military Bldg. # 1024). |
| 19-186700 | 1961 Sentry Station (Access Area; Military Bldg. # 1025). |
| 19-186701 | 1961 Nike-Hercules Missile Warheading (Military Bldg. # 1026). |
| 19-186702 | 1962 Nike-Hercules Assembly & Service B1dg. (Military Bldg. # 1027). |
| 19-186703 | 1961 Sentry Dog Kennel (removed; Military Bldg. # 1029). |
| ---------- | 1961 Sentry Dog Training Area (removed; Military bldg. # 1034). |

| | |
|---|---|
| 19-186704 | 1965 Sentry Dog Equipment Storage Bldg. (removed, only floor remains; Military Bldg. # 1028). |
| 19-186705 | 1957 Ready Room with Latrine, Office Room (Military bldg. # 1030). |
| 19-186706 | 1942 Underground Gun Fortification (Battery Paul Bunker; Military bldg. # 1031). |
| 19-186707 | 1955 Nike-Ajax Liquid Fuel Station (Military bldg. # 1032). |
| ---------- | 1959 Flammable Storage Shed (removed; Military bldg. # 1033). |
| 19-186708 | 1964 General Purpose Administrative Bldg. (removed, floor remains; Military bldg. # 1050). |
| 19-186709 | 1956 Nike-Ajax Launcher Control Trailer Pad (Military bldg. # unassigned). |
| 19-186710 | 1961 Nike-Hercules Launcher Control Group Pad (Military bldg. # unassigned). |

B. Historic Map Research

In addition to the records search, historic USGS maps of the Palos Verdes Peninsula were reviewed for the project. Topographic maps examined included the 1896 *San Pedro* 15' USGS Sheet (surveyed 1894), the 1928 *San Pedro Hill* 7.5' USGS Quadrangle, and the 1944 *San Pedro* 15' U.S. Army Corps of Engineer (War Department) Quadrangle. Information gleaned from each of these maps is presented in the following paragraphs.

**1. 1896 San Pedro 15' USGS Sheet (surveyed 1894)**

A review of the 1896 map indicates the presence of Paseo del Mar, Pacific Avenue, Point Fermin Lighthouse, and the Ramón Sepúlveda residence at White Point. The well-established street grid of lower San Pedro and the San Pedro Branch Railroad are also shown. With the exception of the Ramón Sepúlveda on the Whites Point Nike Missle property, the surrounding area is devoid of other residences.

**2. 1928 San Pedro Hills 7.5' USGS Quadrangle**

An inspection of the 1928 map shows the ever-expanding urban grid of San Pedro and Fort McArthur Upper Military Reservation. White Point Hot Springs resort is also indicated at Royal Palms and numerous scattered residences are now depicted in the White Point area.

**3. 1944 San Pedro 15' U.S. Army Corps of Engineers (War Department) Quadrangle**

This map illustrates the well-established San Pedro Street grid. The developed Los Angeles Harbor, Point Fermin Lighthouse, and arterial roads through the Palos Verde Peninsula. Main circulation roads through San Pedro such as Western Avenue, Paseo del Mar, Gaffey Street and Pacific Avenue are also depicted. Several scattered residences are shown in the vicinity of Whites Point. The map also includes the location of the Outlet Pier for the first outfall and notation of the White Point Hot Springs (fig. 4).

C. Shipwreck Database Review Summary

Shipwreck information provided by the Sanitation Districts Clearwater Program indicated that four shipwreck databases were searched. These included: (1) the National Oceanic and Atmospheric Administration's (NOAA) Automated Wreck and Obstruction Information System (AWOIS), (2) the California State Lands Commission (CSLC) database of shipwrecks, (3) the Minerals Management Service (MMS), and (4) the Global Maritime Wrecks Database (GMWD). Database results revealed that there are three shipwrecks near the APE. These comprise the *San Ubaldo* (construction date unknown, sunk 1926), the *Saint Joseph* (construction date unknown, sunk 1975), and the *Melrose* (constructed in 1902, sunk 1938). The *San Ubaldo* lies at a depth of approximately 30 feet and the *Saint Joseph* at 20 feet. The *Melrose* appears to have run aground and broken up.

An analysis of the shipwreck data by the Sanitation Districts resulted in the conclusion that it is unlikely that the rehabilitation of the existing outfalls will have an impact on existing submerged resources. However, it is acknowledged that no underwater cultural resource surveys have been conducted within or near the APE. Consequently, it is noted that the potential exists to encounter significant historic resources in the general area. For a more thorough discussion of the shipwreck database review, the reader is referred to Chapter 7 of the Clearwater Program EIR/EIS. The coordinates of the three shipwrecks are as follows:

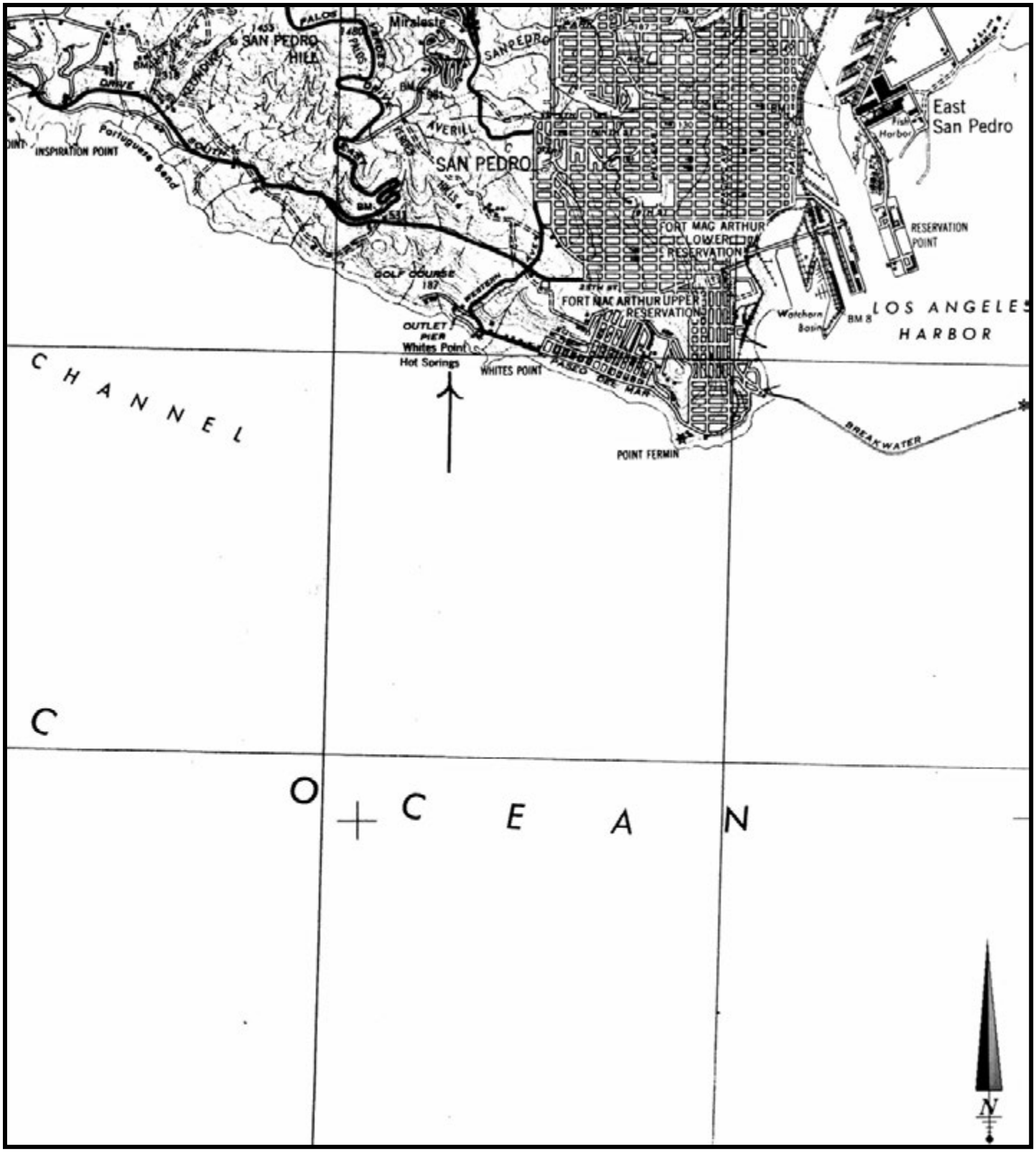


**Figure 4**. Location of Outfall Outlet Pier as shown on a portion of the 1944 *San Pedro* 15' U.S. Army Corps of Engineers (War Department) Quadrangle.

1. *San Ubaldo* (33deg 42'00'N, 118deg 20'00'W)
2. *Saint Joseph* (33deg 42'00'N 118deg 19'00'W)
3. *Melrose* (33deg 42'00'N 118deg 17'00'W)

D. Sacred Lands File Check

On May 19, 2011, a Sacred Lands File Check for the project area was requested by Ms. Laura S. White, M.A. The search was conducted on May 24, 2011 by Mr. Dave Singleton, Program Analyst for the NAHC in Sacramento. The results of the search indicated that no sacred Native American sites have been recorded within the APE. A list of both individual and Native American groups was also provided for further consultation (see Appendix C).

E. Native American Scoping

In order to learn more about the potential archaeological sensitivity of the project area, letters of inquiry were sent to all nine Native American contacts (individuals and tribes) provided by the NAHC. To date, only one written response has been received. Follow-up phone calls were placed on July 28, 2011. The reader is referred to Appendix D for all correspondence.

F. Field Survey

The evaluation of the ocean outfall was based solely on historical records, technical engineering data, and period photographs. As the whole of the outfall lies underwater, no cultural resource surveys were undertaken in conjunction with the evaluation.

## VII. REPORT OF FINDINGS

A. Prehistoric Resources

The results of the records search conducted at the SCCIC at California State University, Fullerton failed to identify any prehistoric resources within the APE boundary. No prehistoric resources of any kind were identified during the course of the research phase of the investigation. However, no underwater surveys of the APE were undertaken in conjunction with prehistoric resources.

B. Historic Resources

The records search also failed to identify any historic resources within the APE boundaries.

Archival research has indicated that three of the four ocean outfalls (60-, 72-, and 90-inch diameter outfalls) within the APE are over 50 years. The fourth outfall (120-inch diameter outfall) is 45 years of age and therefore is considered modern pursuant to both NRHP and CEQA criteria. Of the three shipwrecks near the APE, two of the vessels were constructed over 50 years ago and therefore considered historic. The third is unknown. No underwater surveys were undertaken in conjunction with historical resources.

## VIII. RESOURCE EVALUATION

The ocean outfall structures were evaluated for significance under criteria based on two separate but overlapping legislative sources: (1) NHPA of 1966, which includes criteria for eligibility to the NRHP; and (2) CEQA, as amended in 1992, which includes criteria for eligibility to the CRHR.

### A. NRHP Evaluation

In order for an historic resource to be significant pursuant to Federal law, it must be eligible for listing in the NRHP. Requirements for listing a property in the National Register are explained in detail in *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*. Generally, listing in the NRHP requires that a building or structure be at least 50 years old and that it possess "The quality of significance in American history, architecture, archaeology, engineering, and culture ... present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association..." and ...

(A) That are associated with events that have made a significant contribution to the broad patterns of our history or

(B) That are associated with the lives of persons significant in our past; or

(C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(D) That have yielded, or may be likely to yield, information important in prehistory or history."

*Criterion A*

The outfalls are not associated with any event important in the history of United States. Sewage outfalls into oceans are a common method of disposing of treated effluent for metropolitan areas located near the coast. That is, these outfalls are not unique in their role of conveying effluent into the sea.

*Criterion* B

The outfalls are not associated with the lives of any individual important to national history.

*Criterion C*

All of the outfalls comprise prefabricated sections of pipe that is constructed of concrete over a metal form. They are of robust construction but of standard design. None of the outfalls exhibit any significant architectural features. None are considered the work of a master and there is no evidence that unique methods or materials were utilized in their construction.

*Criterion D*

Given the utilitarian uses of these structures, it is highly unlikely that any has the potential to yield additional information pertinent to national history. Consequently, none of the outfalls, including the 120-inch that is less than 50 years of age, appear significant pursuant to NHRP criteria.

B. CRHR Evaluation

All four outfalls were also evaluated for significance under the CEQA. CEQA, as amended in 1992, includes criteria for CRHR eligibility. Resources eligible for listing include buildings, sites, structures, objects, or historic districts that retain historic integrity and are historically significant at the local, state or national level under one or more of the following four criteria:

(1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

(2) It is associated with the lives of persons important to local, California, or national history;

(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or

(4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

*Criterion 1*

These outfalls are not associated with any event important in the local/regional history of California. They are not the only treated effluent outfalls in the region. The City of Los Angeles maintains an outfall in San Pedro Harbor and a second in Santa Monica Bay. Additionally, the Orange County Sanitation District maintains two outfalls located off the Newport Beach coast. No unique uses other than conveying effluent into the sea has been identified with these outfalls.

*Criterion* 2

None of the outfalls is associated with the lives of any individual important to local or California history.

*Criterion 3*

The concrete over iron frame sections of pipeline are well-designed and built to withstand the ravages of time. However, they were prefabricated at a factory off-site and are of standard design. None of the outfalls exhibit any unique architectural or design features. That is, they were designed and constructed to be purely utilitarian in design and function. None of the four outfalls is considered the work of a master and there is no evidence that unique methods or materials were utilized in their construction.

*Criterion 4*

Given the utilitarian uses of these structures, it is highly unlikely that they have the potential to yield any additional information pertinent to the history of the local area or the State of California or the nation. Consequently, none of the outfalls, including the 120-inch that is less than 50 years of age, appear significant pursuant to CRHR criteria.

## IX. CONCLUSIONS AND RECOMMENDATIONS

The results of the evaluation indicate that none of the outfalls appear to meet the threshold criteria for significance at the national or state levels. Project plans call for rehabilitation of three of the four outfalls which would entail re-ballasting and repair of section joints on an as needed basis. The proposed program will have minimal impact if any on the alignments or the pipelines themselves. The shipwreck database search which was prepared independently of this evaluation concluded that it is unlikely that the undertaking will have an impact on existing (submerged) resources. Therefore, no further work in conjunction with cultural resources is recommended or warranted. As a matter of course, the outfalls have been recorded on the appropriate DPR 523 series forms and submitted to the SCCIC at California State, University at Fullerton for assignment of a Primary Number.

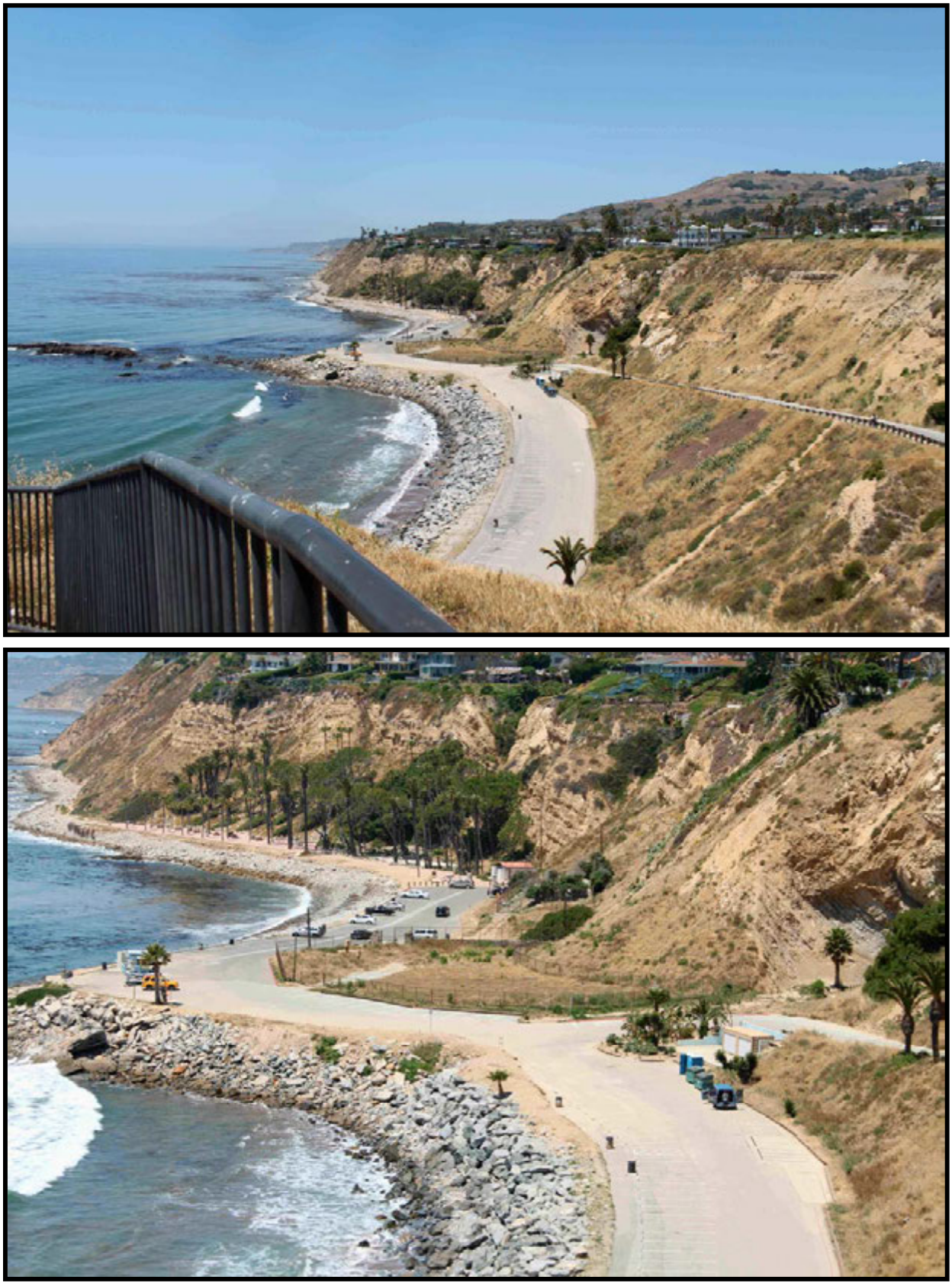

**Plate I. Top:** Looking west from White Point Bluff Park above Royal Palms County Beach toward beginning of outfall. **Bottom:** Looking west at location of outfall manifold (fenced grassy area). **Photo courtesy of LACSD.**

**Plate II. Top:** Looking down upon outfall manifold location from bluff above. Photo courtesy of LACSD. **Bottom:** Looking south/southwest out to sea from shoreline adjacent to manifold area. **Top photo courtesy of LACSD.**

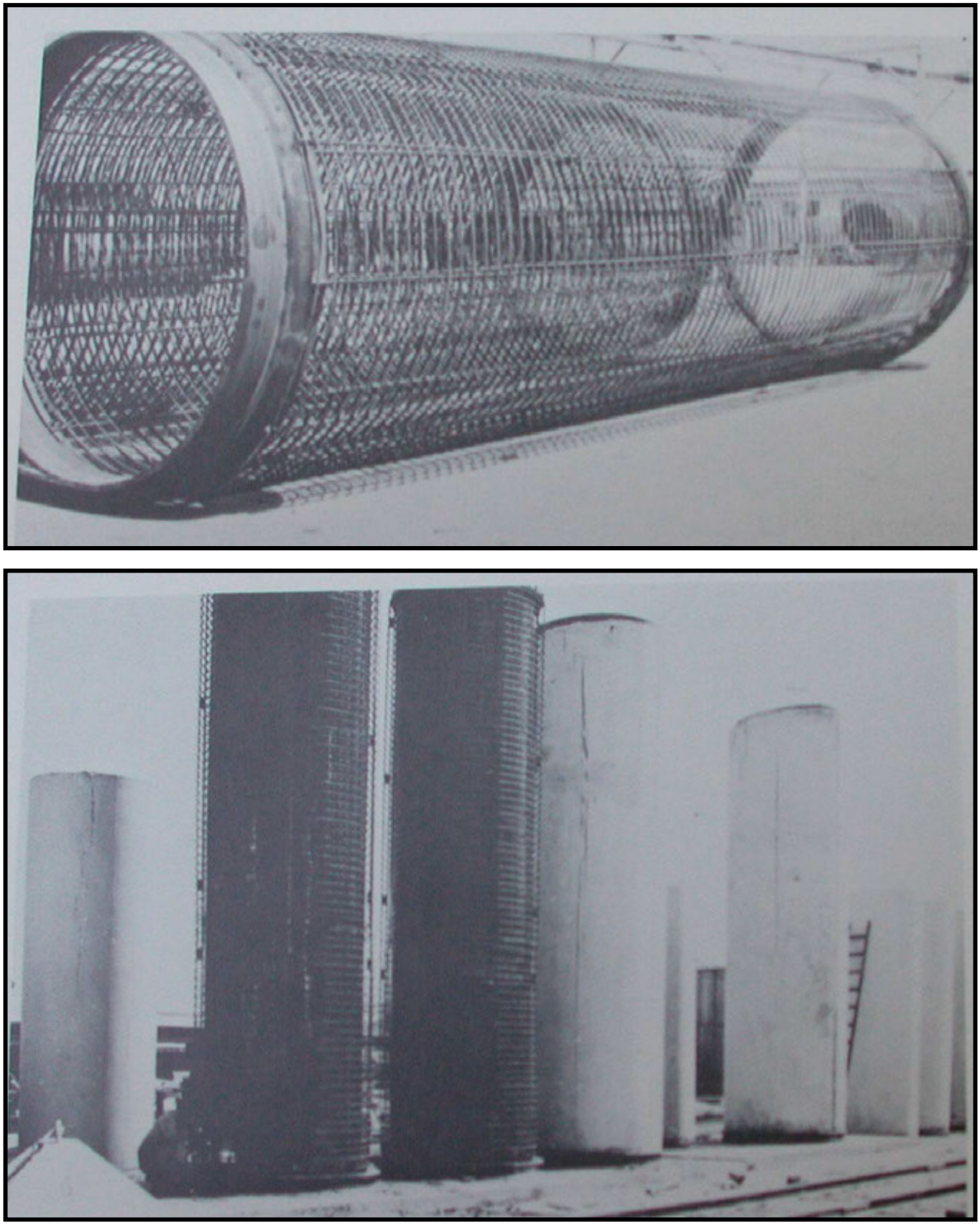

**Plate III. Top:** Close-up of metal reinforcing cage with cast iron end rings as used in the 24 foot sections of the 72-inch outfall. **Bottom:** Various sections of metal reinforced concrete pipe under construction (**photos from Rawn 1965**).

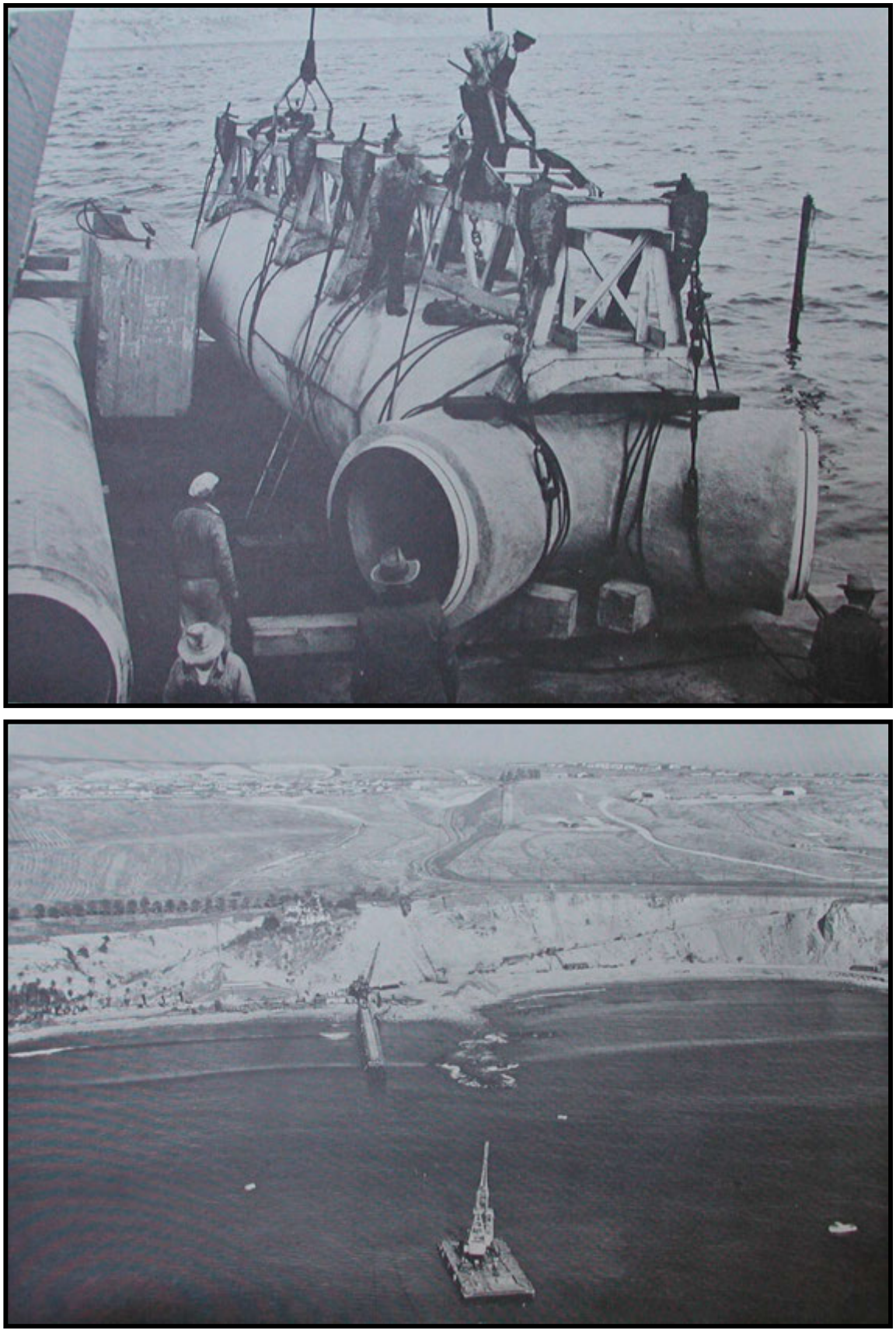

**Plate IV. Top:** Close-up of prefabricated section of outfall with "Y" attached on barge ready for launching. **Bottom:** Aerial view looking north towards Royal Palms Beach showing temporary pier and floating barge used for launching pipe sections (**photos from Rawn 1965**).

## REFERENCES CITED


BEAN, JOHN LOWELL, and CHARLES R. SMITH

1978 Gabrieliño. In: *Handbook of North American Indians,* Vol. 8: California. Smithsonian Institution. Washington, D.C.

BISSELL, RONALD M.

1989 Cultural Resources Reconnaissance of Approximately 455 acres in the Palos Verdes Peninsula, Los Angeles County. RMW Paleo Associates, Inc. Unpublished report (LA-1840) on file with the South Central Coastal Information Center, California State University, Fullerton.

BROCK, JAMES

1994 Site record form of LAN-2211 on file with the South Central Coastal Information Center, California State University, Fullerton.

CALIFORNIA DEPARTMENT OF PARKS AND RECREATION

1989 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format*. California Office of Historic Preservation. Sacramento.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD (LOS ANGELES REGION)

2011 Waste Discharge Requirements for the Joint Outfall System, Joint Water Pollution Control Plant Discharge to the Pacific Ocean (Tentative Version).

CHARTKOFF, J. L. and KERRY KONA CHARTKOFF

1984 *The Archaeology of California*. Stanford University Press. Stanford.

DUBNEWYCH, STEVE, JON KANESHIRO, and CALVIN JIN

2007 Joint Water Pollution Control Plant Tunnel and Ocean Outfall Project.

FEDERAL REGISTER

2008 Intent to Prepare a Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) for a Permit Application for the Sanitation Districts of Los Angeles County's (Sanitation Districts) Clearwater Program in Los Angeles County, CA. Volume 73, Number 194, Notices, Page 58213-58214.

FINK, AUGUSTA

1966 *Time and the Terraced Land*. Howell North Books. Berkeley.

GILLINGHAM, ROBERT C.

1961 *The Rancho San Pedro*. Cole-Holmquist Press.

GNERRE, SAM

2010 White Point Hot Spring Hotel. South Bay History. Daily Breeze. San Pedro.

HAUG, DAVID, P.E. BCEE
2011 Personal communication. Senior Engineer. Sanitation Districts of Los Angeles County.

HEIZER, ROBERT F. (editor)
1968 *The Indians of Los Angeles County: Hugo Reid's Letters of 1852.* Southwest Museum. Los Angeles.

HEIZER, ROBERT F. and THOMAS R. HESTER
1978 Great Basin Projectile Points: Forms and Chronology. Ballena Press. Socorro.

HOOVER, MILDRED B., HERO E. RENSCH, and ETHEL G. RENSCH
1932 *Historic Spots in California*. Stanford University Press. Stanford.

JOHNSTON, BERNICE E.
1962 *The Gabrieliño Indians*. Southwest Museum. Los Angeles.

KROEBER, ALFRED E.
1925 *Handbook of The Indians of California*. Bureau of American Ethnology, Bulletin No. 78. Smithsonian Institution. Washington, D.C.

LALONE, MARY
1980 *Gabrieliño Indians of Southern California: An Annotated Ethnohistoric Bibliography*. Occasional Paper 6. Institute of Archaeology, University of California. Los Angeles.

MEGOWAN, MAUREEN
2010 History of San Pedro. Private.

MORATTO, MICHAEL J.
1984 *California Archaeology*. Academic Press. San Diego.

PALISADES RESIDENTS ASSOCIATION
2011 History. White Point.

PARKHURST, JOHN D., LESTER A. HAUG, and MALCOLM L. WHITT
1967 Ocean Outfall Design for Economy of Construction. Water Pollution Control Federation. Vol 39, No. 6, pp. 987-993.

RAWN, A.M.
1965 Narrative-C.S.D.: The Formative and Growth Years for the County Sanitation Districts of Los Angeles County, 1923-1961.

RAWN, A.M. and F.R. BOWERMAN
1950 Chapter 21: Factors Influencing and Limiting the Location of Sewer Ocean Outfalls. Proceedings of First Conference on Coastal Engineering. Long Beach.

ROBINSON, W.W.
1939 *Ranchos become Cities.* San Pasqual Press. Pasadena.

SALLS, ROY A.
1990 Return to Big Dog Cave: The Last Evidence of a Prehistoric Fishery on the Southern California Bight. *Pacific Coast Archaeological Society Quarterly*, Vol. 26, Nos. 2 & 3, pp. 38-60. Costa Mesa.

SANITATION DISTRICTS OF LOS ANGELES COUNTY
2011 Clearwater Program Overview.

2010 Board of Directors Regular Meeting, County Sanitation District No. 2 of Los Angeles County. Consent Agenda dated June 23, 2010.

2008 Clearwater Program Notice of Preparation of an Environmental Impact Report.

1995 Final Joint Outfall System 2010 Masters Facilities Plan.

SCHECHTER, SUE
2000 State Historical Resources Commission Findings. California Register of Historical Resources. White's Point Nike Launcher Area Missile Site 43L Historic District, San Pedro Los Angeles County.

STICKEL, E. G.
1978 Los Angeles-Long Beach Harbor Areas Cultural Resources Survey, Los Angeles County, California. L. J. Weinman and E.G. Stickel eds., U.S. Army Corps of Engineers, Los Angeles.

TANIGUCHI, CHRISTEEN
2005 Primary record 19-188185 on file with the South Central Coastal Information Center, California State University, Fullerton.

THACKER, MARY EVA
1923 *History of Los Palos Verdes Rancho, 1542-1923.* M.A. thesis, Department of History, University of Southern California, Los Angeles.

WALLACE, WILLIAM J.
1978 Post-Pleistocene Archaeology, 9000 to 2000 B.C. In: *Handbook of North American Indians, California Vol. 8*, pp. 535-537, R.F. Heizer, ed. Smithsonian Institution. Washington, D.C.

1955 A Suggested Chronology for Southern California Coastal Archaeology. *Journal of Southwestern Anthropology* 11(3):214-230.

WARREN, CLAUDE N.
1968 Cultural Traditions and Ecological Adaptations on the Southern California Coast. In: Archaic Prehistory in the Western United States, C. Irwin-Williams ed. Eastern New Mexico University Contributions in Anthropology, Vol. 1 (3): 1-14. Portales.

WAUGH, ISAMI ARIFUKU, Ph.D.
1988 Japanese Americans in California. In: Five Views: An Ethnic Historic Site Survey for California. National Park Service.

# APPENDIX A: Personnel Qualifications

**LAURA S. WHITE, PRINCIPAL INVESTIGATOR**

* 1989 M.A. in Anthropology with emphasis in Archaeology, San Diego State University, San Diego.

* 1981 B.A. in Anthropology, University of San Diego, San Diego.

* 1999-Present Member of the Register of Professional Archaeologists (RPA) Certification: Archaeologist (I.D. # 10452)

* 1990-1998 Member of the Society of Professional Archaeologists (SOPA) Certification: Field Research

* Riverside County Certified Archaeologist

* Orange County Certified Archaeologist

* San Diego County Certified Archaeologist

* Holds a "blanket" Cultural Resource Use Permit on the supervisory level with the Bureau of Land Management (BLM) for the Ridgecrest, Barstow, Palm Springs, El Centro, and Needles desert resources areas.

* 25 years of full-time experience conducting cultural resource management projects in southern California.

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**ROBERT S. WHITE, PROJECT DIRECTOR**

* 1987 B.A. in Liberal Studies with emphasis in Anthropology, California State University, Long Beach.

* 1977 A.A. Degree in Liberal Arts, Los Angeles Harbor College.

* Riverside County Certified Archaeologist

* Orange County Certified Archaeologist

* Holds a "blanket" Cultural Resource Use Permit on the supervisory level with the Bureau of Land Management (BLM) for the Ridgecrest, Barstow, Palm Springs, El Centro, and Needles desert resources areas.

* 26 years of full-time experience conducting cultural resource management projects in southern California.

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# APPENDIX B: Records Search Results

## ARCHAEOLOGICAL RECORDS SEARCH

An in-person archaeological records search was conducted by Laura S. White, M.A. at the South Central Coastal Information Center (SCCIC) at California State University Fullerton on May 16, 2011. Consequently, there is no official letter from the Information Center to attach here. The in-person search included a review of all previously recorded prehistoric and historic archaeological sites situated within a one-mile radius of the study area. Additionally, the National Register of Historic Places (NRHP), California Historic Landmarks (CHL), and California Points of Historical Interest (CPHI) were reviewed for the purpose of identifying any historic properties. Copies of site record forms were obtained for those resources situated within a one-mile radius of the APE. Additional survey/excavation reports were re reviewed and all relevant information was incorporated into the study.

# APPENDIX C. Sacred Lands File Check

# ARCHAEOLOGICAL ASSOCIATES

May 19, 2011

Mr. Dave Singleton
Associate Governmental Program Analyst
Native American Heritage Commission
915 Capital Mall, Room 364
Sacramento, CA 95814

**RE: Sacred Lands File Check for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Singleton:

I am writing to you to request a Sacred Lands File Check for the above-referenced project. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle).

We look forward to hearing from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:file;nahc.com
***by fax***

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

**NATIVE AMERICAN HERITAGE COMMISSION**
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

May 24, 2011

Ms. Laura S. White, M.A., Direld Director
**ARCHAEOLOGICAL ASSOCIATES**
P.O. Box 180
Sun City, CA 92586

Sent by FAX to: 951-244-0084
No. of Pages: 4

Re: Sacred Lands File Search and Native American Contacts list for the **"Los Angeles County Sanitation District Clearwater Joint Outfall System Project;"** located in the San Pedro Area; Los Angeles County, California,

Dear Ms. White:

The Native American Heritage Commission (NAHC) conducted a Sacred Lands File search of the 'areas of potential effect,' (APEs) based on the USGS coordinates provided and found **Native American cultural resources were not identified** in the locations you specified. However, the NAHC Sacred Lands Inventory is not exhaustive; Native American cultural resources may be inadvertently discovered during ground-breaking activity.

The California Environmental Quality Act (CEQA – CA Public Resources Code §§ 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. CA Government Code §65040.12(e) defines "environmental justice" provisions and is applicable to the environmental review processes.

Early consultation, even during Initial Study or First Phase surveys with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Local Native Americans may have knowledge of the religious and cultural significance of the historic properties of the proposed project for the area (e.g. APE). Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). We urge consultation with those tribes and interested Native Americans on the list of Native American Contacts we attach to this letter in order to see if your proposed project might impact Native American cultural resources. Lead agencies should consider avoidance as defined in §15370 of the CEQA Guidelines when significant cultural resources as defined by the CEQA Guidelines §15064.5 (b)(c)(f) may be affected by a proposed project. If so, Section 15382 of the CEQA Guidelines defines a

significant impact on the environment as "substantial," and Section 2183.2 which requires documentation, data recovery of cultural resources.

Partnering with local tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq*. and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation.

Also, California Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery', another important reason to have Native American Monitors on board with the project.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. An excellent way to reinforce the relationship between a project and local tribes is to employ Native American Monitors in all phases of proposed projects including the planning phases.

Confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibility threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List

**Native American Contact List**
Los Angeles County
May 24, 2011

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th St, Rm. 403
Los Angeles , CA 90020
randrade@css.lacounty.gov
(213) 351-5324
(213) 386-3995 FAX

Gabrielino Tongva Nation
Sam Dunlap, Chairperson
P.O. Box 86908 Gabrielino Tongva
Los Angeles , CA 90086
**samdunlap@earthlink.net**
(909) 262-9351 - cell

Ti'At Society/Inter-Tribal Council of Pimu
Cindi M. Alvitre, Chairwoman-Manisar
6515 E. Seaside Walk, #C Gabrielino
Long Beach , CA 90803
calvitre@yahoo.com
(714) 504-2468 Cell

Gabrielino Tongva Indians of California Tribal Council
Robert F. Dorrnae, Tribal Chair/Cultural Resources
P.O. Box 490 Gabrielino Tongva
Bellflower , CA 90707
**gtongva@verizon.net**
562-761-6417 - voice
562-761-6417- fax

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas, Tribal Admin.
Private Address Gabrielino Tongva
,
**tattnlaw@gmail.com**
310-570-6567

Gabrielino-Tongva Tribe
Bernie Acuna
1875 Century Pk East #1500 Gabrielino
Los Angeles , CA 90067
(760) 721-0371-work
(310) 428-7720 - cell
(310) 587-0170 - FAX
bacuna1@gabrieinotribe.org

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
GTTribalcouncil@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 -FAX

Shoshoneon Gabrieleno Band of Mission Indians
Andy Salas, Chairperson
PO Box 393 Gabrieleno
Covina , CA 91723
(626) 926-4131
gabrielenoindians@yahoo.com
(213) 688-0181 - FAX

**This list is current only as of the date of this document.**

**Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.**

**This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Los Angeles County Sanitation District Clearwater Joint Outfall System; located in the San Pedro Area; Los Angeles County, California for which a Sacred Lands File search and Native American Contacts list were requested.**

**Native American Contact List**
Los Angeles County
May 24, 2011

Gabrielino-Tongva Tribe
Linda Candelaria, Chairwoman
1875 Century Park East, Suite 1500
Los Angeles , CA 90067 Gabrielino
lcandelaria1@gabrielinoTribe.org
626-676-1184- cell
(310) 587-0170 - FAX
760-904-6533-home

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Los Angeles County Sanitation District Clearwater Joint Outfall System; located in the San Pedro Area; Los Angeles County, California for which a Sacred Lands File search and Native American Contacts list were requested.

# APPENDIX D. Native American Scoping

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Ron Andrade, Director
LA City/County Native American Indian Commission
3175 West 6th Street, Room 403
Los Angeles, CA 90020

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Andrade:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

We are seeking input from the tribe with regards to places of importance that may or may not have been previously identified. In particular, if the tribe is aware of the presence of prehistoric or historic resources within or adjacent to the project area, we would very much like to hear from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Cindi Alvitre
Ti'At Society
6515 E. Seaside Walk, #C
Long Beach, CA 90803

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Ms. Alvitre:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

We are seeking input from the tribe with regards to places of importance that may or may not have been previously identified. In particular, if the tribe is aware of the presence of prehistoric or historic resources within or adjacent to the project area, we would very much like to hear from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDcleawater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

John Tommy Rosas
Tribal Administrator
Tongva Ancestral Territorial Tribal Nation

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Rosas:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

We are seeking input from the tribe with regards to places of importance that may or may not have been previously identified. In particular, if the tribe is aware of the presence of prehistoric or historic resources within or adjacent to the project area, we would very much like to hear from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084 Email aa@inland.net**

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Anthony Morales, Chairperson
Gabrielino/Tongva San Gabriel Band of Mission Indians
P.O. Box 693
San Gabriel, CA 91778

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Morales:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

We are seeking input from the tribe with regards to places of importance that may or may not have been previously identified. In particular, if the tribe is aware of the presence of prehistoric or historic resources within or adjacent to the project area, we would very much like to hear from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Sam Dunlap, Tribal Secretary
Gabrielino Tongva Nation
P.O. Box 86908
Los Angeles, CA 90086

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Dunlap:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

We are seeking input from the tribe with regards to places of importance that may or may not have been previously identified. In particular, if the tribe is aware of the presence of prehistoric or historic resources within or adjacent to the project area, we would very much like to hear from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Robert Dorame, Tribal Chair/Cultural Resources
Gabrielino Tongva Indians of California Tribal Council
P.O. Box 490
Bellflower, CA 90707

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Dorame:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely unferwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

We are seeking input from the tribe with regards to places of importance that may or may not have been previously identified. In particular, if the tribe is aware of the presence of prehistoric or historic resources within or adjacent to the project area, we would very much like to hear from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Bernie Acuna
Gabrielino-Tongva Tribe
1875 Century Park East, Suite 1500
Los Angeles, CA 90067

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Acuna:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

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Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Andy Salas, Chairperson
Shoshoneon Gabrielino Band of Mission Indians
P.O. Box 393
Covina, CA 91723

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Mr. Salas:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

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Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084**

Andrew Salas
Chairman

Nadine Salas
Vice-Chairman

Christina Swindall-Martinez
Secretary

Albert Perez
Treasurer I

Martha Gonzalez-Lemos
Treasurer II

Albert Acuna, Jr
Chairman of the
Council of Elders

Ernest P. Salas Tautimez
Chief and Spiritual Leader

GABRIELEÑO BAND OF MISSION INDIANS

Historically known as The San Gabriel Band of Mission Indians
recognized by the State of California as the aboriginal tribe of the Los Angeles basin

Laura White, Field Director
Archaeology Associates
PO Box 180
Sun City, CA 92586

Dear Mrs. White,

June 15, 2011

This letter is in response to your letter dated May 25, 2011 in regards to the Clearwater Joint Outfall System – *San Pedro*. The proposed project is within a culturally sensitive area. San Pedro was a central area to our tribe's trade with the Channel Islands. Also in the Spanish era, it was a focal area of commerce between the San Gabriel Mission and other countries. In order to protect our resources we're requesting one of our experienced & certified Native American monitors to be on site during all ground disturbance.

For your information, when the NAHC states there are "no records of sacred sites" in the subject area, they will always refer the contractors back to the Native American Tribes whose tribal territory the project area is in. This is due to the fact that the NAHC is only aware of general information on each California Native American Tribe. They are not the experts on our Tribe, our historic and prehistoric village sites or our culturally sensitive areas. Our Elder Committee & Tribal historians are the experts and is the reason why the NAHC will always refer contractors to the local tribes.

You may contact me anytime at the email, phone or address below. Thank you.

Sincerely,

Andrew Salas, Chairman

# ARCHAEOLOGICAL ASSOCIATES

May 25, 2011

Linda Candelaria, Chairwoman
Gabrielino-Tongva Tribe
1875 Century Park East, Suite 1500
Los Angeles, CA 90067

**RE: Native American Consultation for the Los Angeles County Sanitation District Clearwater Joint Outfall System, located offshore of Royal Palms in the White Point area of San Pedro, Los Angeles County.**

Dear Ms. Candelaria:

Archaeological Associates has been requested to provide information with regard to prehistoric resources in the vicinity of the project. Thus, the reason for contacting your organization. Presently, the Los Angeles County Sanitation District plans to repair/rehabilitate several existing sewer outfalls that lie completely underwater offshore from Royal Palms Park in San Pedro. Each of the outfalls is approximately 1400 feet in length, constructed of concrete pipe and covered with rock ballast. The project involves underwater inspection of the outfalls, repair of any breeches in the pipes or joints, and the replacement of the rock ballast as needed. It is to emphasized that this project is completely under the water. No land based improvements are anticipated at this time. Legally, the project is situated within an unsectioned portion of Township 5 South, Range 14 West, San Bernardino Base Meridian (*San Pedro* 7.5' USGS Topographic Quadrangle- see attached map).

We are seeking input from the tribe with regards to places of importance that may or may not have been previously identified. In particular, if the tribe is aware of the presence of prehistoric or historic resources within or adjacent to the project area, we would very much like to hear from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

Very truly yours,

Laura S. White

Laura S. White, M.A.
Field Director

LSW:LACSDclearwater
attachment

**P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084 Email aa@inland.net**

| Native American Phone Log Summary | | | | |
|---|---|---|---|---|
| **CALLER** | **PERSON** | **DATE** | **TIME** | **RESULT** |
| Laura White | Ron Andrade | 07/28/11 | 3:45 p.m. | Out of office. Left message with secretary to return call. |
| Laura White | Cindi Alvitre | 07/28/11 | 3:50 p.m. | No answer. Left message to return call. |
| Laura White | Anthony Morales | 07/28/11 | 3:55 p.m. | No concerns as long as standard discovery clause is incorporated into report. |
| Laura White | Sam Dunlap | 07/28/11 | 4:00 p.m. | No answer. Left message to return call. |
| Laura White | Robert Dorame | 07/28/11 | 4:05 p.m. | No answer. Left message to return call. |
| Laura White | Bernie Acuna | 07/28/11 | 4:10 p.m. | No answer on cell phone. Unable to leave a message. Tribal office mailbox full, unable to leave a message. |
| Laura White | Linda Candelaria | 07/28/11 | 4:25 p.m. | No answer on cell phone. Unable to leave a message. Tribal office mailbox full, unable to leave a message. |
| Robert White | John Tommy Rosas | 07/28/11 | N/A | No response. |

# APPENDIX E. Primary Record for Outfall-1

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

# PRIMARY RECORD

Primary # 19-
HRI #
Trinomial
**NRHP Status Code:** 6Z
Other Listings
Review Code Reviewer Date

***Resource Name or #:** Outfall-1 **Caltrans Map Reference No.:** N/A
**P1. Other Identifier:** Whites Point Outfall
***P2. Location: *a. County** Los Angeles **County/Route/Postmile:** N/A
**b. Address**
**City** **Zip**
***c. UTM: USGS Quad:** San Pedro 7.5' **d. UTM:** 60" Outfall **Beach Point**-377598mE/3731437mN,
***e. Other Locational Data (APN #)** Offshore of Royal Palms Beach (1799 W. Paseo del Mar, San Pedro)

***P3a. Description:** (Briefly describe resource below)
The Sanitation Districts of Los Angeles County operates and maintains four ocean outfalls off the Whites Point shoreline in San Pedro. They comprise: (1) a 60-inch diameter pipe constructed in 1937, (2) a 72-inch diameter pipe constructed in 1947, (3) a 90-inch diameter pipe constructed in 1954, and (4) a 120-inch diameter pipe constructed in 1966. From the Joint Water Pollution Control Plant (JWPCP) in Carson, effluent, or treated wastewater, is conveyed through two, 6-mile tunnels to Royal Palms Beach. Here a subterranean manifold structure (reinforced concrete vault) directs the effluent into the four ocean outfalls for disposal into the Pacific Ocean. (see continuation sheet for further description)

***P3b. Resource Attibutes:** HP20- Canal/Aqueduct
****P4. Resources Present:** ___ Building __X__ Structure ___ Object ___ Site ___ District ___ Elements of District ___ Other

**P5b. Description of Photo:** S/SW view out to sea from shoreline manifold.
***P6. Date Constructed/Age:** 1937-1966 (factual)
__X__ Historic ___ Prehistoric ___ Both
***P7. Owner and Address:**
Sanitation Districts of
Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601
***P8. Recorded by:**
Laura S. White
Archaeological Associates
P.O. Box 180
Sun City, CA 92586
***P9. Date Recorded:** August 1, 2011
***P10. Type of Survey:** ___ Intensive ___ Reconnaissance __X__ Other
**Describe:** Evaluation only--Site is offshore under water

***P11. Report Citation:** A Cultural Resources Evaluation of the Sanitation Districts of Los Angeles County Whites Point Ocean Outfall System, Offshore of Royal Palms Beach, San Pedro, Los Angeles County by Laura and Robert White (August 2011).

***Attachments:** ___ NONE __X__ Map Sheet __X__ Continuation Sheet __X__ Building, Structure and Object Record ___ Linear Resource Record ___ Archaeological Record ___ District Record ___ Milling Station Record ___ Rock Art Record ___ Artifact Record ___ Photograph Record ___ Other (List):

# BUILDING, STRUCTURE, AND OBJECT RECORD

See Office of Historic Preservation Recording Historical Resources for instructions.

**Map Reference No.:** N/A

***Resource Identifier:** Outfall-1 ***NRHP Status Code:** 6Z

**B1. Historic Name:** Whites Point Outfall

**B2. Common Name:** Sanitation Districts Ocean Outfall **County/Route/Postmile:** N/A

**B3. Original Use:** Sewer Outfall **B4. Present Use:** Sewer Outfall

***B5. Architectural Style:**

***B6. Construction History:** 72-inch oufall modified /extended in 1953, including removal of the (see continuation sheet)

***B7. Moved?** X No ___ Yes ___ Unknown **Date:** **Original Location:**

***B8. Related Features** (describe below)**:**

None.

**B9a. Architect:** **B9b. Builder:** Los Angeles County Sanitation District

***B10. Significance: Theme:** Sanitary Sewer **Area:** Los Angeles County

**Period of Significance:** 1937-present **Property Type:** Sewer outfall **Applicable Criteria:** N/A

The ocean outfall structures were evaluated for significance using both NRHP and CEQA criteria. As for Criterion A of the NRHP, the outfalls are not associated with any event important in the history of United States. Sewage outfalls into oceans are a common method of disposing of treated effluent for metropolitan areas located near coastline. That is, these outfalls are not unique in their role of conveying effluent into the sea. As for Criterion B, the outfalls are not associated with the lives of any individual important to national history. As for Criterion C, all of the outfalls comprise prefabricated sections of pipe that is constructed of concrete over a metal form. They are of robust construction but of standard design. None of the outfalls exhibit any significant architectural features. None are considered the work of a master and there is no evidence that unique methods or materials were utilized in their construction. As per Criterion D, given the utilitarian uses of these structures, it is highly unlikely that any has the potential to yield additional information pertinent to national history. Consequently, none of the outfalls, including the 120-inch that is less than 50 years of age, appear significant pursuant to NHRPcriteria.

**B11. Additional Resource Attributes:**

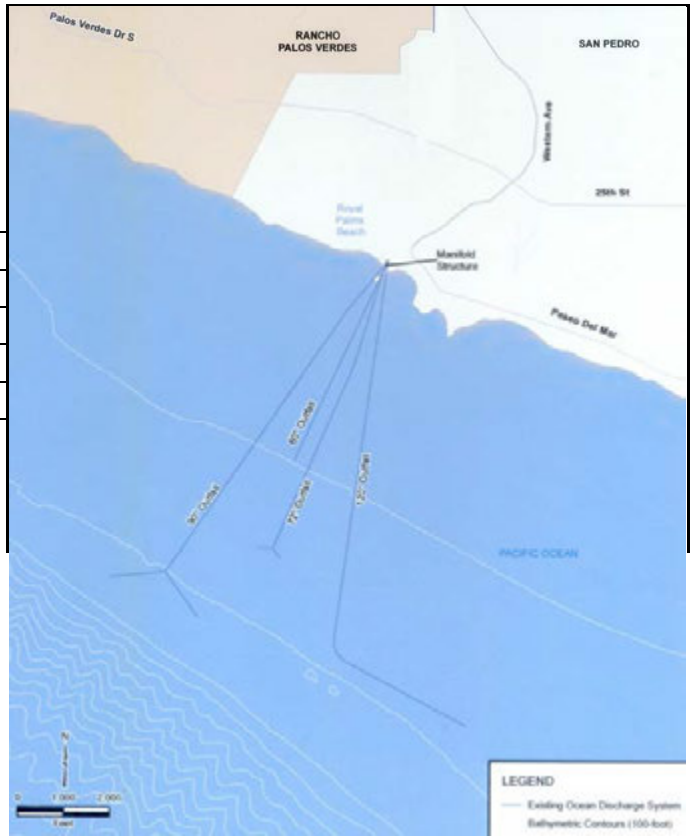
**B12. References:**

Sanitation Districts of Los Angeles County

**B13. Remarks:**

**B14. Evaluator:** Laura S. White
Archaeological Associates
P.O. Box 180
Sun City, CA 92586

**Date of Evaluation:** August 1, 2011



Primary Record-P2. Location: d. UTM
60" Outfall **End Point**- 376970mE/ 3730217mN.

72" Outfall **Beach Point**-377598mE/ 3731437mN, 72" Outfall **End Point**- 376833mE/ 3729655mN, 72" Outfall **West "Y" Point**-376746mE/ 3729618mN, 72" Outfall **East "Y" Point**- 376881mE/ 3728578mN.

90" Outfall **Beach Point**-377598mE/ 3731437mN, 90" Outfall **End Point**- 376078mE/ 3729486mN, 90" Outfall **West "Y" Point**-375748mE/ 3729447mN, 90" Outfall **East "Y" Point**-376286mE/ 3729196mN.

120" Outfall **Beach Point**- 377598mE/ 3731437mN, 120" Outfall **Beginning Curve Point**- 377216mN/ 3729103mN, 120" Outfall **Ending Curve Point**- 377219mE/ 3728913mN, 120" Outfall **End Point**- 378036mE/ 3728414 mN.

P3a. Description:
The design and construction of all four outfalls is similar in nature. The sections consist of reinforced concrete pipes, 8 and 24 feet in length. They are all prefabricated from concrete placed over iron forms. The pipes were placed on the sea floor using a floating crane. The pipe sections have gasketed bell and spigot joints. The 60-inch and 72-inch outfalls have a lead packing gasket in each joint. The 90-inch outfall has both a lead packing and rubber gasket. The 120-inch outfall joints have neoprene gaskets. Pipe sections within the breaker line are placed in shallow trenches that were excavated using explosive charges. This portion of each outfall is thoroughly ballasted with rock. Outside the breaker line, the pipe sections lie upon the sea floor. Each outfall terminates in one or more diffusers fitted with multiple small openings to facilitate the dispersion of the treated effluent. The maximum depth of the discharge points ranges from 110 to 210 feet below sea level. Outfall lengths as measured from the onshore manifold vary from 5,000 to 11,880 feet.

Building , Structure and Object Record-B.6: Construction History
original diffusers and adding new diffusers/ports at the end of the extension in a "Y" configuration. The 60-inch outfall was modified/extended in 1954, including removal of the original diffusers and coring new ports in the original outfall pipe. The 90-inch outfall was re-ballasted in 1997. The 72-inch, 90-inch, and 120-inch outfalls were re-ballasted in 1999.

B.12: Significance
In applying Criterion 1 of the CRHR, these outfalls are not associated with any event important in the local/regional history of California. They are not the only treated effluent outfalls in the region. The City of Los Angeles maintains an outfall in San Pedro Harbor and a second in Santa Monica Bay. Additionally, the Orange County Sanitation District maintains two outfalls located off the Newport Beach coast. No unique uses other than conveying effluent into the sea has been identified with these outfalls. Per Criterion 2, none of the outfalls is associated with the lives of any individual important to local or California history. In the application of Criterion 3, it is to be noted that the concrete over iron frame sections of pipeline is well designed and built to withstand the ravages of time. However, they are prefabricated at a factory off-site and are of standard design. None of the outfalls exhibit any unique architectural or design features. That is, they were designed and constructed to be purely utilitarian in design and function. None of the four outfalls is considered the work of a master and there is no evidence that unique methods or materials were utilized in their construction. Per Criterion 4, given the utilitarian uses of these structures, it is highly unlikely that they have the potential to yield any additional information pertinent to the history of the local area or the State of California. Consequently, none of the outfalls, including the 120-inch that is less than 50 years of age, appear significant pursuant to CRHR criteria.

| State of California — The Resources Agency<br>DEPARTMENT OF PARKS AND RECREATION<br>**LOCATION MAP** | Primary # | 19- |
|---|---|---|
| | HRI# | |
| | Trinomial | |

See Office of Historic Preservation Recording Historical Resources for instructions.

**Resource Identifier:** Outfall-1 **Caltrans Map Reference No.:** N/A

**County/Route/Postmile:** N/A

Map Name: San Pedro 7.5' USGS Topographic Map *Scale: 1-inch = 2000 ft *Date of Map: 1979, PR 1981

## Appendix 8-A

# LETTER REGARDING POTENTIAL FOR ALTERNATIVE 4 TUNNEL ALIGNMENT TO AFFECT SLOPE STABILITY, ROYAL PALMS STATE BEACH AREA

**FUGRO CONSULTANTS, INC.**

4820 McGrath Street, Suite 100
Ventura, California 93003-7778
**Tel: (805) 650-7000**
Fax: (805) 650-7010

November 9, 2011
Project No. 04.B3387004

Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, California 90601

Attention: Mr. Calvin Jin, P.E.

Subject: Potential for the Proposed Alternative 4 Tunnel Alignment to Affect Slope Stability, Royal Palms State Beach Area, Los Angeles County

Dear Mr. Jin:

Recent landslide activity on Paseo del Mar near White Point State Beach has raised concern regarding the potential for proposed tunneling activities to affect the stability of the existing slopes (Figure 1). The Sanitation Districts of Los Angeles County (Districts) have requested Fugro to evaluate local geologic conditions and provide an opinion on the potential for the proposed tunnel construction to impact the existing slope stability. This letter summarizes our opinions of the potential for proposed tunnel construction of Alignment 4 along Western Avenue and at the manifold structure at Royal Palms Beach to affect the stability of the adjacent slopes and if the integrity of a tunnel (newly constructed or existing) would be compromised should a landslide occur.

## SITE CONDITIONS

The shoreline and bluffs in the project vicinity trend northwest-southeast and are composed of the Altamira Shale member of the Miocene Monterey Formation. The geologic structure of the Monterey Formation can be intensely folded and highly variable over short distances (Figure 2) and contains weak bentonitic layers that have resulted in the large-scale landslides (South Shores, Abalone Cove, Portuguese Bend, etc.) near the project area shown on Plate 1 - Dibblee Geologic Map. The Alternative 4 alignment option is located about 2,000 to 3,000 feet west of the recent landslide activity on Paseo del Mar near White Point State Beach (Figure 1 and Plate 1). The large-scale landslides and the recent landslide near White Point State Beach likely have occurred along weak bedding planes in areas where the bedrock dips unfavorably (out of slope). Published geologic mapping by Dibblee (1999[1]) indicates that the bedding near White Point dips about 36 to 50 degrees to the southwest as shown on Plate 1.

In contrast, Dibblee indicates that the bedding in the vicinity of the proposed tunnel alignment dips favorably into the slope at inclinations of about 50 to 75 degrees to the northeast. Plate 2 - Cross Section G-H' depicts the interpreted geologic structure in the project area and shows the favorably oriented bedding mapped by Dibblee. This cross section parallels the existing 8-foot-diameter tunnel and is consistent with interpretations made by Schultz (1937[2]) during excavation of the existing tunnel (see Plates 3 and 4). The slope instabilities that have occurred near White Point State Beach and to the northwest of the project site are less likely to occur along favorably oriented geologic bedding such as what has been mapped by Dibblee in the project area.

---

[1] Dibblee, T.W., (1999), Geologic map of the Palos Verdes Peninsula and vicinity, Redondo Beach, Torrance and San Pedro quadrangles, Los Angeles County, California: Dibblee Geological Foundation Map DF-70.

[2] Schultz, J.R. (1937), Geology of the Whites Point Outfall Sewer Tunnel: Ph.D. Dissertation, California Institute of Technology, Pasadena, California, 43 p.

DOC #

REC'D LACSD
NOV 14 '11 AM 10:51

Jin C

Preliminary tunnel design for the Alternative 4 alignment is proposed to extend to a minimum depth of about 30 to 50 feet below the toe of the bluff. The proposed tunnel construction process is unlikely to result in significant amounts of settlement, disturbance, or weakness of the overlying materials.

Slope failures in bluff areas underlain by favorably-oriented bedding are anticipated to be related to natural processes such as wave-cut erosion resulting in undercutting of the slope or possibly scouring of the slope face from surface water runoff (e.g. culverts depositing water on the slope as seen in Figure 2). Resulting instabilities or deformations likely will be limited to areas above the toe of the slope and not extend to depths of the existing or proposed tunnels. The reinforced concrete tunnel may improve local slope stability; however, additional geotechnical analyses using site specific geologic and geotechnical data would need to be performed as part of final design to confirm this assumption.

**OPINIONS**

On the basis of the favorably-oriented geologic bedding indicated by Dibblee (1999) and Schultz (1937) and on the depth of the tunnel profile, in our opinion it appears unlikely that tunnel construction will impact the stability of the existing slopes in the vicinity of the proposed alignment. Further, based on the depth of the proposed tunnel profile, surficial slope instability occurring above the toe of the bluff is not anticipated to affect a tunnel installed about 30 to 50 feet below the toe of the bluff.

We recommend that a more detailed slope stability evaluation be made as part of the final design of Alternative 4 should it be selected as the preferred alternative. In addition, the slopes should be instrumented and monitored in advance and during construction activities as a precautionary measure.

**CLOSURE**

Thank you for the opportunity to continue to provide geotechnical input on the LACSD Outfall Project. Please contact us if you have any questions on the information provided herein.

Sincerely,

FUGRO CONSULTANTS, INC.

REGISTERED PROFESSIONAL ENGINEER PATRICK McINTOSH SMITH No. 2660 Exp. 6/30/13 GEOTECHNICAL STATE OF CALIFORNIA

REGISTERED GEOLOGIST LORI E. PRENTICE EG NO. 2312 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

Patrick M. Smith, Ph.D., G.E.
Associate Engineer

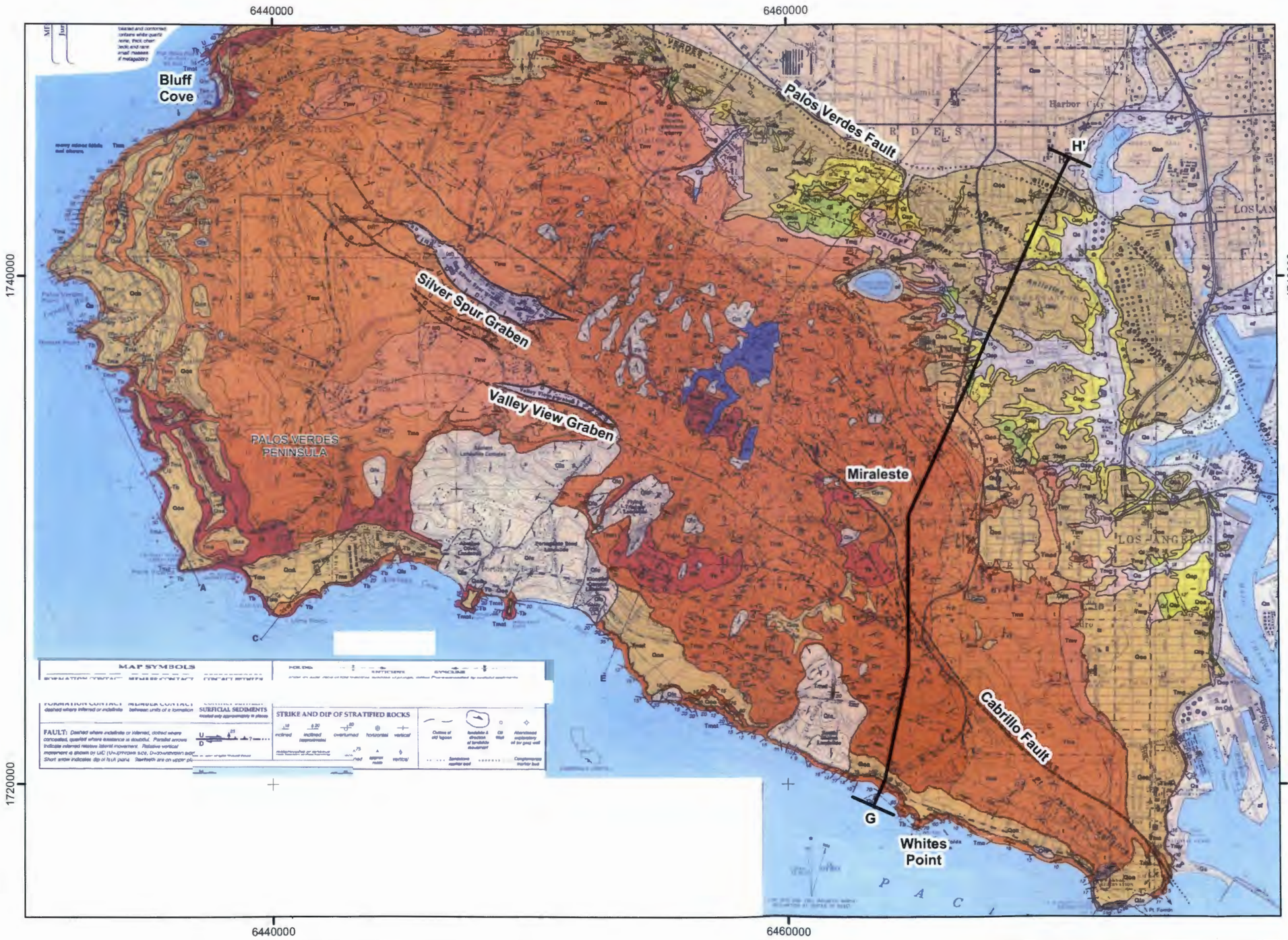
Lori E. Prentice, C.E.G.
Principal Engineering Geologist

Copies Submitted: (2) Addressee
(1) Mr. David Haug, P.E., Districts

Attachments: Figures
Plates

**Figure 1. Area of recent landslide activity near White Point State Beach.**

**Figure 2. Recumbent fold above Royal Palms Beach.**




**Legend**

G — H' Dibblee Cross Section G-H' (See Plate 2)

**Geologic Units Along Section**

| | |
|---|---|
| Qa | Quaternary Alluvium |
| Qae | Quaternary Alluvium, Slightly Elevated |
| Qoa | Quaternary Older Alluvium |
| Qsp | Quaternary San Pedro Sand |
| Ql | Quaternary Lomita Marl |
| Tfp | Pliocene Fernando Formation, Pico Member |
| Tfr | Pliocene Fernando Formation, Siltstone-Claystone |
| Tmg | Miocene Malaga Mudstone |
| Tmv | Miocene Monterey Formation, Valmonte Diatomite |
| Tmad | Miocene Monterey Formation, Diatomite |
| Tma | Miocene Monterey Formation, Altamira Shale, Upper |
| Tmal | Miocene Monterey Formation, Altamira Shale, Lower |
| | Miocene Basalt, Mafic Extrusive and Intrusive |
| sc | Jurassic Catalina Schist |

Source: Dibblee, 1999

Coordinate Grid: CA State Plane, Zone 5, NAD83, Feet

N

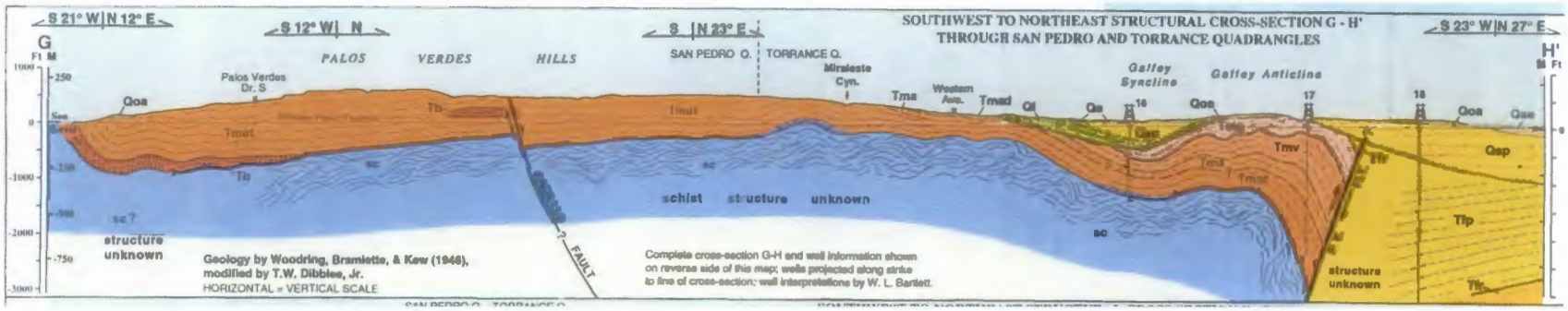
HORIZONTAL SCALE = 1:48,000

0 2,000 4,000 8,000 Feet

**DIBBLEE GEOLOGIC MAP**
JWPCP Tunnel and Ocean Outfall Project
Los Angeles, California

PLATE 1

N:\Projects\3387_LACSD\3387-004_LACSDTunnelOutputs\Reports\2011_06_Phase1C_Final_Report\MXD\Figures\Section_02\Plate3_Dibblee_RegGeoMap_SSLetter.mxd, 10/26/11, jgreenwald




SOURCE: Modified from Dibblee, 1999

NOTES:

1) Cross Section Parallels Whites Point Tunnel Outfall and was generated based on data from that project.

2) See Plate 1 for cross section location.

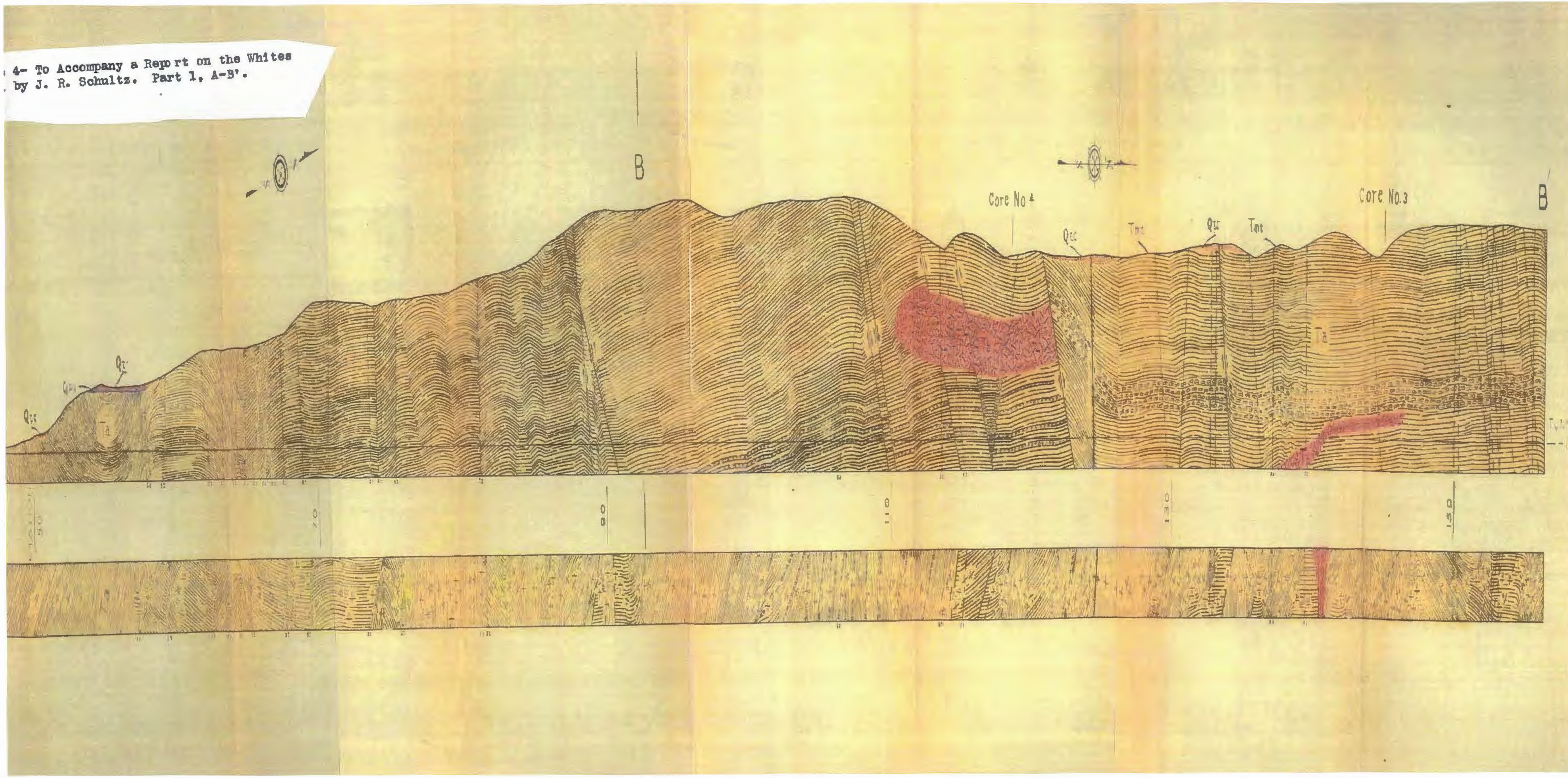
PLATE 2

**GEOLOGIC STRUCTURAL CROSS SECTION G-H'**
JWPCP Tunnel and Ocean Outfall Project
Los Angeles, California

Sanitation Districts of Los Angeles County
Project No. 04.B3387004

**SCHULTZ GEOLOGIC MAP AND CROSS SECTION LOCATION**
JWPCP Tunnel and Ocean Outfall Project
Los Angeles, California

PLATE 3




**SCHULTZ GEOLOGIC CROSS SECTION A-B'**
JWPCP Tunnel and Ocean Outfall Project
Los Angeles, California

PLATE 4

# APPENDIX 9-A
# GREENHOUSE GAS EMISSIONS CALCULATIONS

# Program Greenhouse Gas Calculations

## GHG CONSTRUCTION CH4 AND N20

**$CO_2$ emissions are summed from the URBEMIS outputs for the individual construction components (see "URBEMIS Summary" tab)*

**UNMITIGATED**

| | Input Emissions | | | | | | |
|---|---|---|---|---|---|---|---|
| | Off Road Emissions | | | On road Emissions | | | |
| Construction Element | **CO2 (metric tons/yr)** | **CH4 (metric tons/yr)** | **N2O (metric tons/yr)** | **CO2 (metric tons/yr)** | **Other (metric tons/yr)** | **CO2e (metric tons/yr)** | |
| Process Optimization - POWRP | 1,000.7 | 0.057 | 0.025 | 152.2 | 8.013 | 1,161.0 | |
| Process Optimization - LBWRP | 1,317.6 | 0.075 | 0.034 | 150.3 | 7.910 | 1,475.9 | |
| Process Optimization - SJCWRP | 1,976.3 | 0.112 | 0.050 | 264.6 | 13.929 | 2,255.1 | |
| Process Optimization - LCWRP | 1,317.6 | 0.075 | 0.034 | 160.7 | 8.460 | 1,486.9 | |
| SJCWRP Plant Expansion | 237.2 | 0.013 | 0.006 | 170.7 | 8.982 | 416.9 | |
| JWPCP Solids Processing | 938.7 | 0.053 | 0.024 | 457.7 | 24.090 | 1,420.6 | |
| *Total Construction Emissions* | ***6,788.1*** | ***0.4*** | ***0.2*** | ***1,356.3*** | ***71.4*** | **8,216.3** | **total GHG emissions** |
| Sources: URBEMIS 2007; CCAR 2009. | | | | | | 273.9 | annual GHGs, amortized over 30 year project life |

Methodology:
Calculated ratio of CO2 emissions per gallon diesel fuel to CH4 and N2O to determine CH4 and N2O emissions from construction equipment

| Diesel Fuel | **CO2** | **CH4** | **N2O** |
|---|---|---|---|
| kg CO2/gal diesel | 10.21 | 0.00058 | 0.00026 |
| g/gal diesel construction equip | | 0.58 | 0.26 |
| ratio | 1 | 5.68071E-05 | 2.54652E-05 |

| Percent other GHGs | (on road)(http://www.epa.gov/climatechange/emissions/downloads06/03ES.pdf) |
|---|---|
| 5.00% | (assumes 50/50 N20/CH4 as "other") |

| N2O | CH4 | percent other with CH4 reductions |
|---|---|---|
| 2.50% | 0.37% | 2.87% |

**Sources:**
GRP, May 2011 update: http://www.theclimateregistry.org/downloads/2009/05/2011-Emission-Factors.pdf
CO2 emission factor - Table 13.1
N20 and CH4 - Table 13.6

| GAS | GWP |
|---|---|
| N2O | 21 |
| CH4 | 310 |

**MITIGATED**

| | Input Emissions | | | | | | |
|---|---|---|---|---|---|---|---|
| | Off Road Emissions | | | On road Emissions | | | |
| Construction Element | **CO2 (metric tons/yr)** | **CH4 (metric tons/yr)** | **N2O (metric tons/yr)** | **CO2 (metric tons/yr)** | **Other (metric tons/yr)** | **CO2e (metric tons/yr)** | **average ROG reductions** |
| Process Optimization - POWRP | 1,000.7 | 0.00831 | 0.025 | 152.2 | 8.013 | 1,160.9 | 85% |
| Process Optimization - LBWRP | 1,317.6 | 0.01096 | 0.034 | 150.3 | 7.910 | 1,475.8 | 85% |
| Process Optimization - LCWRP | 1,976.3 | 0.01645 | 0.050 | 264.6 | 13.929 | 2,254.9 | 85% |
| Process Optimization - SJCWRP | 1,317.6 | 0.01096 | 0.034 | 160.7 | 8.460 | 1,486.8 | 85% |
| SJCWRP Plant Expansion | 237.2 | 0.00194 | 0.006 | 170.7 | 8.982 | 416.8 | 86% |
| JWPCP Solids Processing | 938.7 | 0.00775 | 0.024 | 457.7 | 24.090 | 1,420.5 | 85% |
| *Total Construction Emissions* | ***6,788.1*** | ***0.1*** | ***0.2*** | ***1,356.3*** | ***71.4*** | **8,215.7** | **total GHG emissions** |
| Sources: URBEMIS 2007; CCAR 2009. | | | | | | 273.9 | annual GHGs, amortized over 30 year project life |

## GHG - daily to annual calculations

| | | | CO2 Pounds per day (from URBEMIS) | | Time to Complete: assumption | Time to Complete: Days | Total Pounds of CO2 to Complete (daily CO2 x total days) | | MT CO2 Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| Process Optimization | | | Off-Road | On-Road | | | Off-Road | On-Road | Off-Road | On-Road |
| | PWRP | excavation | 3,308.97 | 3,546.07 | 3.4 months | 74.8 | 247,510.96 | 265,246.04 | 112.27 | 120.31 |
| | | install | 4,321.74 | 155.35 | 20.6 months | 453.2 | 1,958,612.57 | 70,404.62 | 888.41 | 31.93 |
| | LBWRP | excavation | 5,101.66 | 3,299.94 | 3.4 months | 74.8 | 381,604.17 | 246,835.51 | 173.09 | 111.96 |
| | | install | 5,567.33 | 186.41 | 20.6 months | 453.2 | 2,523,113.96 | 84,481.01 | 1,144.47 | 38.32 |
| | SJCWRP | excavation | 5,101.66 | 4,070.57 | 5.1 months | 112.2 | 572,406.25 | 456,717.95 | 259.64 | 207.16 |
| | | install | 5,567.33 | 186.41 | 30.9 months | 679.8 | 3,784,670.93 | 126,721.52 | 1,716.70 | 57.48 |
| | LCWRP | excavation | 5,101.66 | 3,608.20 | 3.4 months | 74.8 | 381,604.17 | 269,893.36 | 173.09 | 122.42 |
| | | install | 5,567.33 | 186.41 | 20.6 months | 453.2 | 2,523,113.96 | 84,481.01 | 1,144.47 | 38.32 |
| SJWRP Plant Expansion | | | | | | | | | | |
| | | site demo | 4,715.67 | 5,272.48 | 3 months | 66 | 311,234.22 | 347,983.68 | 141.17 | 157.84 |
| | | Install | 458.26 | 61.13 | 21 months | 462 | 211,716.12 | 28,242.06 | 96.03 | 12.81 |
| JWPCP Solids Processing | | | | | | | | | | |
| | | Excavation | 5,101.66 | 4,182.74 | 10 months | 220 | 1,122,365.20 | 920,202.80 | 509.10 | 417.40 |
| | | Install | 1,655.97 | 155.35 | 26 months | 572 | 947,214.84 | 88,860.20 | 429.65 | 40.31 |
| | | | | | | | 14,965,167.34 | 2,990,069.76 | 6,788.09 | 1,356.27 |

based on similar projects (see "program assumptions" workbook)

conversions

*22 working days/month*

*0.000453592 pounds to MT*

## GHG SUMMARY FROM OPERATIONS

| *CEQA Baseline* | **CO2** | **CH4** | **N2O** | **CO2e** | **% of total** |
|---|---|---|---|---|---|
| N2O from Nitrification | -- | -- | 7.657 | 2374 | 19.82% |
| Purchased Electricity | 609 | 0.025 | 0.006 | 612 | 5.11% |
| CH4 from Combustion of Digester Gas | -- | 1.559 | 0.201 | 95 | 0.79% |
| Biosolids Hauling | 8,890 | 0.023 | 0.025 | 8897 | 74.28% |
| **sum** | **9,499** | **1.6** | **7.9** | **11,978** | 75.08% |

| *With Program* | **CO2** | **CH4** | **N2O** | **CO2e** | **% of total** |
|---|---|---|---|---|---|
| N2O from Nitrification | -- | -- | 9.597 | 2975 | 13.91% |
| Purchased Electricity | 1,439 | 0.060 | 0.013 | 1444 | 6.75% |
| CH4 from Combustion of Digester Gas | -- | 1.918 | 0.247 | 117 | 0.55% |
| Biosolids Hauling | 16,790 | 0.044 | 0.046 | 16805 | 78.60% |
| Generator at SJCWRP | 39 | 0.002 | 0.001 | 40 | 0.19% |
| **sum** | **18,268** | **2** | **10** | **21,380** | 100.00% |

| *Net change* | **CO2** | **CH4** | **N2O** | **CO2e** | **% of total** |
|---|---|---|---|---|---|
| N2O from Nitrification | -- | -- | 1.940 | 601 | 6.40% |
| Purchased Electricity | 829 | 0.034 | 0.008 | 833 | 8.85% |
| CH4 from Combustion of Digester Gas | -- | 0.359 | 0.046 | 22 | 0.23% |
| Biolsolids Hauling | 7,900 | 0.020 | 0.022 | 7907 | 84.10% |
| Generator at SJCWRP | 39 | 0.002 | 0.001 | 40 | 0.42% |
| **sum** | **8,769** | **0** | **2** | **9,402** | 100.00% |

## Operations - GHG Emissions from Wastewater Processes

**Methods:**

*Obtained emission factors from LACSD.*
*CH4 was based on source test information*
*N2O was based on default factor from CARB Mandatory Reporting Rule Table 6*
*Net increase in Digester Gas based on 23% increase over existing digester gas production, which is 3178.87 mmscf*

**Emission Factors**

| Device | Emission Factor | Factor (MT-$N_2O$/mmcf[2,] |
|---|---|---|
| boiler | 0.0000686 | 0.0000631 |
| flare | 0.0004905 | 0.0000631 |
| worst case | 0.0004905 | 0.0000631 |

MT = metric tons
mmcf = million cubic feet of fuel
GWP of CH4 *21*
GWP of N2O *310*

*1 - Based on site-specific source test information*
*2 - Default emission factor from CARB Mandatory Reporting Rule, Table 6*
*3 - BTU content of digester gas needed for the conversion, 631 BTU/f* [3]

*Scaling 23%*

**Emissions**

**JWPCP Emissions - CH4 and N2O from incomplete combustion of digester gas**

| | | Emission Factors (Metric Tons per MMCF) | | Metric Tons per Year | | |
|---|---|---|---|---|---|---|
| | Digest Gas Increase (mmcf) | CH4 | N2O | CH4 | N2O | **CO2e** |
| Baseline | 3178.87 | 0.0004905 | 0.0000631 | 1.559 | 0.201 | **94.93** |
| Project | 3910.01 | 0.0004905 | 0.0000631 | 1.918 | 0.247 | **116.76** |
| *increment* | *731.14* | *0.0004905* | *0.0000631* | *0.359* | *0.046* | ***21.83*** |

net change in CO2e over project life 21.83
project life (years, from 2012-2050) 42
annual average change 0.52

| | ***Baseline (2008)*** | ***2020*** | ***2030*** | ***2040*** | ***2050*** |
|---|---|---|---|---|---|
| *years since baseline* | - | *12* | *22* | *32* | *42* |
| net over baseline | | 6.237982885 | 11.436302 | 16.63462103 | 21.8329401 |
| *TOTAL* | *94.93* | *101.16* | *106.36* | *111.56* | *116.76* |

**SJCWRP Emissions - N2O from Nitrification/Denitrification**

| | | | | Metric Tons per Year | |
|---|---|---|---|---|---|
| | Service Population | Emission Facotor (MT $N_2O$) /person./yr | Conversion Factor (MT/g) | N2O Emissions from NDN (MT) | **CO2e** |
| Baseline | 1,093,849 | 7 | 0.000001 | 7.656943 | **2373.65** |
| Project | 1,370,949 | 7 | 0.000001 | 9.596643 | **2974.96** |
| increment | *277,100* | *7* | *0.000001* | *1.9397* | ***601.31*** |

net change in N2O over project life 601
project life (years, from 2012-2050) 42
annual average change 14.32

| | ***Baseline (2008)*** | ***2020*** | ***2030*** | ***2040*** | ***2050*** |
|---|---|---|---|---|---|
| *years since baseline* | - | *12* | *22* | *32* | *42* |
| net over baseline | | 171.802 | 314.97033 | 458.1386667 | 601.307 |
| *TOTAL* | *2373.65* | *2545.45* | *2688.62* | *2831.79* | *2974.96* |

## Operations - GHGs from Electricity Purchases

| SUMMARY | Baseline | With Project | Increment |
|---|---|---|---|
| SJCWRP Plant Expansion | 612 | 963 | 351 |
| SJCWRP Process Optimization | 0 | 42 | 42 |
| POWRP Process Optimization | 0 | 296 | 296 |
| LCWRP Process Optimization | 0 | 84 | 84 |
| LBWRP Process Optimization | 0 | 59 | 59 |
| **total GHGs from additional Electricity** | **612** | **1,444** | **833** |

**Sources:**

CO2, CH4, N2O emission factors are from the updated eGRID2010 emission factors, Table 14.1 of:
www.theclimateregistry.org/downloads/2009/05/2011-Emission-Factors.pdf
Electricity consumption information from the Client (email from Glenn Acosta to Nicole Williams, 05/25/2010 at 9:59am)

**Emission factors:**

| | | | |
|---|---|---|---|
| CO2 | 681.01 | lbs/MWh | Table 14.1 |
| CH4 | 0.02829 | lbs/MWh | Table 14.1 |
| N2O | 0.00623 | lbs/MWh | Table 14.1 |

| Electricty Consumption Calcs | units | Existing | With Project |
|---|---|---|---|
| SJCWRP Plant Expansion | daily MWh | 5.4 | 8.5 |
| | annual MWh | 1,972 | 3,105 |
| Pomona Flow Equalization | daily kwh | 0 | 373 |
| | annual MWh | 0 | 136 |
| SJC Flow Equalization | kwh | 0 | 2,611 |
| | annual MWh | 0 | 954 |
| Los Coyotes Flow Equalization | kwh | 0 | 746 |
| | annual MWh | 0 | 272 |
| Long Beach Flow Equalization | kwh | 0 | 522 |
| | annual MWh | 0 | 191 |

MWh/yr = MWh * 365.25 days per year
MWh/yr = Kwh * 365.25 days per year / 1000 KW per MW

**GHG Calcs**

CEQA BASELINE

| | electricity (MWH) | lbs/yr CO2 | lbs/yr CH4 | lbs/yr N2O | MT/yr CO2 | MT/yr CH4 | MT/yr N2O | MT/yr CO2e |
|---|---|---|---|---|---|---|---|---|
| SJCWRP Plant Expansion | 1,972 | 1,343,190 | 56 | 12 | 609 | 0.03 | 0.01 | 612 |
| Pomona Flow Equalization | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0 |
| SJC Flow Equalization | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0 |
| Los Coyotes Flow Equalization | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0 |
| Long Beach Flow Equalization | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0 |
| | *1,972* | *1,343,190* | *56* | *12* | *609* | *0.03* | *0.01* | *612* MT CO2e/yr |

With Project

| | electricity (MWH) | k CO2 | k CH4 | k N2O | MT/yr CO2 | MT/yr CH4 | MT/yr N2O | MT/yr CO2e |
|---|---|---|---|---|---|---|---|---|
| SJCWRP Plant Expansion | 3,105 | 2,114,281 | 88 | 19 | 959 | 0.04 | 0.01 | 963 |
| Pomona Flow Equalization | 136 | 92,780 | 4 | 1 | 42 | 0.00 | 0.00 | 42 |
| SJC Flow Equalization | 954 | 649,457 | 27 | 6 | 295 | 0.01 | 0.00 | 296 |
| Los Coyotes Flow Equalization | 272 | 185,559 | 8 | 2 | 84 | 0.00 | 0.00 | 84 |
| Long Beach Flow Equalization | 191 | 129,842 | 5 | 1 | 59 | 0.00 | 0.00 | 59 |
| | *4,658* | *3,171,918* | *132* | *29* | *1,439* | *0.06* | *0.01* | *1,444* MT CO2e/yr |

Increment

| | electricity (MWH) | CO2 | CH4 | N2O | CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|
| SJCWRP Plant Expansion | 1,132 | 771,091 | 32 | 7 | 350 | 0 | 0 | 351 |
| Pomona Flow Equalization | 136 | 92,780 | 4 | 1 | 42 | 0 | 0 | 42 |
| SJC Flow Equalization | 954 | 649,457 | 27 | 6 | 295 | 0 | 0 | 296 |
| Los Coyotes Flow Equalization | 272 | 185,559 | 8 | 2 | 84 | 0 | 0 | 84 |
| Long Beach Flow Equalization | 191 | 129,842 | 5 | 1 | 59 | 0 | 0 | 59 |
| | *2,685* | *1,828,728* | *76* | *17* | *829* | *0.03* | *0.01* | *833* MT CO2e/yr |

Conversions

| | |
|---|---|
| CO2 | 1 |
| CH4 | 21 |
| N2O | 310 |
| | |
| days per year | 365.25 |
| kwh to mwh | 0.001 |
| lbs to MT | 0.000453592 |

| | |
|---|---|
| net change in CO2e from electricity purchases over project life | 833 |
| project life (years, from 2012-2050) | 42 |
| annual average change in CO2e from rom electricity purchases | 19.82 |

| | *Baseline (2008)* | *2020* | *2030* | *2040* | *2050* |
|---|---|---|---|---|---|
| *years since baseline* | - | *12* | *22* | *32* | *42* |
| net over baseline | | 237.8780801 | 436.1098135 | 634.3415468 | 832.57328 |
| *TOTAL* | *611.52* | *849.40* | *1047.63* | *1245.86* | *1444.09* |

## SJCWRP Emergency Generator Emission Calculations

Assumes a Tier 4 2000 HP generator

Emsision standards from EPA420-P-03-002: http://www.epa.gov/oms/models/nonrdmdl/nonrdmdl2010/420r10018.pdf
ROG converted from HC using a 1.053 multiplier
CO2 and SO2 emission factors calculated using equations 6 and 7 on page 24 of EPA420-P-03-002

**Emission Standards**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | *1.053* | | | |
| | | | grams per hp-hr | | | | | | | | |
| | | | CO | NOX | PM10 | PM2.5 | ROG | SO2 | CO2 | HC | BSCF |
| Tier 4 Final | >1200 HP gen set | | 0.7642 | 0.46 | 0.069 | - | 0.2964195 | 0.048733651 | 530.1334357 | 0.2815 | 0.367 |

**Emission Calculations**

| ***Equipment*** | Number | Equipment Model Year | Annual Hours Use | Load Factor | Engine (hp) | Daily HP-HR | | **ROG** | **CO** | **NOX** | **SO2** | **PM10** | **PM2.5** | **N2O** | **CH4** | **CO2** | **CO2e** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Emission Factor (lb/hp-hr) | 6.53E-04 | 1.68E-03 | 1.01E-03 | 1.07E-04 | 1.52E-04 | 1.40E-04 | 2.97623E-05 | 6.63929E-05 | 1.17E+00 | -- |
| Generator | 1 | 2035 (Tier 4) | 50 | 0.74 | 2000 | 1480 | lbs/day (if run for 1 hr) | 1.0 | 2.5 | 1.5 | 0.2 | 0.2 | 0.2 | 0.0 | 0.1 | 1729.7 | -- |
| | | | | | | | MTs/yr (assuming 50 hours of testing per year) | | | | | | | 0.001 | 0.002 | 39 | 40 |

| Conversions | |
|---|---|
| grams per pound | 453.59237 |
| PM2.5 fraction of PM | 0.92 |
| lbs to MT | 0.000453592 |
| tons to MT | 0.90718474 |
| | |
| GWP | |
| CO2 | 1 |
| CH4 | 21 |
| N2O | 310 |

Emission Factors from Tier 4 Emission Standards
Emission Factor for N20 and CH4 based on ratio of N2O and CH4 to CO2 per gallon of diesel fuel in the GRP (CR 2011)

| | kg/gallon | g/gallon | ratio |
|---|---|---|---|
| CO2 | 10.21 | 10210 | |
| N2O | | 0.26 | 2.54652E-05 |
| Ch4 | | 0.58 | 5.68071E-05 |

SO2 Calculation for EF's — based on: http://www.epa.gov/oms/models/nonrdmdl/nonrdmdl2010/420r10018.pdf

g hp/hr or SO2 = (BSFC * 453.6 * (1-soxcnv)) - HC) * 0.01 * soxdsl * 2 *(equation 7, pg 24)*

Where:

| | | |
|---|---|---|
| BSFC = Brake Specif | 0.408 | *Table A4 for all HPs* |
| of fuel sulfur | 0.02247 | *Page C5* |
| HC = in-use adjuste | from above | |
| soxdsl = episodic | | |
| weight percent of | 0.015 | |
| | 453.59 | |
| | 0.01 | |
| | 2 | |

CO2 Calculation for EF's — based on: http://www.epa.gov/oms/models/nonrdmdl/nonrdmdl2010/420r10018.pdf

CO2 = (BSFC * 453.6 - HC) * 0.87 * (44/12) *(equation 6, pg 24)*

Where:

| | | |
|---|---|---|
| BSFC = Brake Specific Fuel | 0.408 | *Table A4 for all HPs* |
| HC = in-use adjusted hc en | from above | |
| carbon mass fraction of | | |
| diesel | 0.87 | |
| ratio of CO2 to carbon ma | 3.666666667 | |
| | 453.59 | |

## Biosolids Hauling Emissions

**Methodology**

Biosolids hauling assumes an additional 20 hauling trips by 2050
Increase in truck hauling trips is scaled linearly assuming 20 additional trucks over the next 42 year period
Exhaust emission factors from EMFAC2007 - BURDEN mode was used for regional hauling emissions and on-site idling calculations (lbs per mile and lbs per trip). EMFAC mode was used assuming 5mph travel for onsite emissions.

Road Dust from EPA AP-42 Section 13.2.1 (2006)

**Truck trips**

20 more daily truck trips over 42 years
0.48 more trucks per year

**Distances**

5 mph ONSITE - Heavy-duty trucks travel on site
0.59 ONSITE - Miles traveled on-site per truck
119.2 REGIONAL - one-way miles to landfills (existing)
164.8 REGIONAL - one-way miles to landfills (project)

**VMT**

| Years to analyze | Truck Trips | REGIONAL Daily VMT (roundtrip) | ONSITE Daily VMT |
|---|---|---|---|
| 2008 | 55 | 13110 | 32 |
| 2020 | 61 | 20007 | 36 |
| 2030 | 65 | 21577 | 39 |
| 2040 | 70 | 23146 | 41 |
| 2050 | 75 | 24715 | 44 |

**Regional Emissions**

| | Criteria Pollutants | | | | | | Greenhouse Gases | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds Per Day | | | | | | Pounds per Day | | | | Metric Tons Per Year | | | |
| | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | CO2 | N20 | CH4 | CO2e | CO2 | N20 | CH4 | CO2e |
| **2008 (baseline)** | | | | | | | | | | | | | | |
| Idling Emissions | 0.6 | 2.0 | 4.3 | 0.1 | 0.1 | 0.1 | 268.5 | 0.0 | 0.0 | 269 | 44 | 0.0001 | 0.0001 | 45 |
| VMT Emissions | 41.0 | 154.2 | 520.3 | 0.5 | 27.0 | 23.9 | 53,118.2 | 0.1 | 0.1 | 53,164 | 8,800 | 0.0230 | 0.0244 | 8,808 |
| Road Dust | -- | -- | -- | -- | 284.8 | 42.7 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **41.6** | **156.3** | **524.6** | **0.6** | **311.8** | **66.7** | **53,386.6** | **0.1** | **0.1** | **53,433.0** | **8,844.8** | **0.0231** | **0.0245** | **8,852.5** |
| **2020** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 1.9 | 5.4 | 0.1 | 0.0 | 0.0 | 296.4 | 0.0 | 0.0 | 297 | 49 | 0.0001 | 0.0001 | 49 |
| VMT Emissions | 18.1 | 83.5 | 196.7 | 0.8 | 12.4 | 9.8 | 81,274.1 | 0.2 | 0.2 | 81,344 | 13,465 | 0.0351 | 0.0373 | 13,477 |
| Road Dust | -- | -- | -- | -- | 434.6 | 65.2 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **18.5** | **85.4** | **202.1** | **0.9** | **447.1** | **75.0** | **81,570.5** | **0.2** | **0.2** | **81,641.1** | **13,514.2** | **0.0352** | **0.0374** | **13,525.9** |
| **2030** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 2.3 | 6.8 | 0.1 | 0.0 | 0.0 | 365.9 | 0.0 | 0.0 | 366 | 61 | 0.0002 | 0.0002 | 61 |
| VMT Emissions | 11.7 | 61.7 | 121.2 | 0.9 | 8.9 | 6.4 | 87,526.7 | 0.2 | 0.2 | 87,603 | 14,501 | 0.0378 | 0.0402 | 14,514 |
| Road Dust | -- | -- | -- | -- | 468.7 | 70.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **12.1** | **64.0** | **128.0** | **1.0** | **477.6** | **76.7** | **87,892.6** | **0.2** | **0.2** | **87,968.8** | **14,561.6** | **0.0380** | **0.0404** | **14,574.2** |
| **2040** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 2.1 | 6.4 | 0.1 | 0.0 | 0.0 | 342.7 | 0.0 | 0.0 | 343 | 57 | 0.0001 | 0.0002 | 57 |
| VMT Emissions | 11.9 | 62.0 | 120.5 | 0.9 | 8.9 | 6.2 | 94,216.7 | 0.2 | 0.3 | 94,298 | 15,609 | 0.0406 | 0.0431 | 15,623 |
| Road Dust | -- | -- | -- | -- | 502.8 | 75.4 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **12.3** | **64.1** | **126.9** | **1.0** | **511.7** | **81.6** | **94,559.4** | **0.2** | **0.3** | **94,641.1** | **15,666.1** | **0.0407** | **0.0433** | **15,679.6** |
| **2050** | | | | | | | | | | | | | | |
| Idling Emissions | 0.4 | 2.3 | 6.8 | 0.1 | 0.0 | 0.0 | 365.9 | 0.0 | 0.0 | 366 | 61 | 0.0002 | 0.0002 | 61 |
| VMT Emissions | 12.7 | 66.2 | 128.7 | 1.0 | 9.5 | 6.6 | 100,604.3 | 0.3 | 0.3 | 100,691 | 16,668 | 0.0433 | 0.0460 | 16,682 |
| Road Dust | -- | -- | -- | -- | 536.9 | 80.5 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **13.1** | **68.5** | **135.5** | **1.1** | **546.3** | **87.2** | **100,970.2** | **0.3** | **0.3** | **101,057.4** | **16,728.2** | **0.0435** | **0.0462** | **16,742.7** |
| **Max Daily with Program** | **18.5** | **85.4** | **202.1** | **1.1** | **546.3** | **87.2** | **100,970.2** | **0.3** | **0.3** | **101,057.4** | **16,728.2** | **0.0** | **0.0** | **16,742.7** |

**On-site Emissions**

| | Pounds Per Day | | | | | | Pounds per Day | | | | Metric Tons Per Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | CO2 | N20 | CH4 | CO2e | CO2 | N20 | CH4 | CO2e |
| **2008 (baseline)** | | | | | | | | | | | | | | |
| VMT Emissions | 0.97 | 2.12 | 3.20 | 0.00 | 0.23 | 0.21 | 271.10 | 0.00 | 0.00 | 271 | 45 | 0.0001 | 0.0001 | 45 |
| Road Dust | -- | -- | -- | -- | 0.70 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.97** | **2.12** | **3.20** | **0.00** | **0.93** | **0.31** | **271.10** | **0.00** | **0.00** | **271.22** | **44.91** | **0.00** | **0.00** | **44.93** |
| **2020** | | | | | | | | | | | | | | |
| VMT Emissions | 0.33 | 0.76 | 0.99 | 0.00 | 0.04 | 0.03 | 302.15 | 0.00 | 0.00 | 302 | 50 | 0.0001 | 0.0001 | 50 |
| Road Dust | -- | -- | -- | -- | 0.78 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.33** | **0.76** | **0.99** | **0.00** | **0.82** | **0.15** | **302.15** | **0.00** | **0.00** | **302.28** | **50.06** | **0.00** | **0.00** | **50.08** |
| **2030** | | | | | | | | | | | | | | |
| VMT Emissions | 0.22 | 0.53 | 0.64 | 0.00 | 0.01 | 0.01 | 326.28 | 0.00 | 0.00 | 326 | 54 | 0.0001 | 0.0001 | 54 |
| Road Dust | -- | -- | -- | -- | 0.84 | 0.13 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.22** | **0.53** | **0.64** | **0.00** | **0.85** | **0.14** | **326.28** | **0.00** | **0.00** | **326.42** | **54.06** | **0.00** | **0.00** | **54.08** |
| **2040** | | | | | | | | | | | | | | |
| VMT Emissions | 0.22 | 0.54 | 0.63 | 0.00 | 0.01 | 0.01 | 350.07 | 0.00 | 0.00 | 350 | 58 | 0.0001 | 0.0001 | 58 |
| Road Dust | -- | -- | -- | -- | 0.90 | 0.14 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.22** | **0.54** | **0.63** | **0.00** | **0.91** | **0.14** | **350.07** | **0.00** | **0.00** | **350.21** | **58.00** | **0.00** | **0.00** | **58.02** |
| **2050** | | | | | | | | | | | | | | |
| VMT Emissions | 0.23 | 0.57 | 0.68 | 0.00 | 0.02 | 0.01 | 373.80 | 0.00 | 0.00 | 374 | 62 | 0.0001 | 0.0001 | 62 |
| Road Dust | -- | -- | -- | -- | 0.96 | 0.14 | -- | -- | -- | -- | -- | -- | -- | -- |
| **Total** | **0.23** | **0.57** | **0.68** | **0.00** | **0.98** | **0.15** | **373.80** | **0.00** | **0.00** | **373.96** | **61.93** | **0.00** | **0.00** | **61.96** |

## Biosolid Hauling Distance to Management Locations

**Methodology**

Calculated a weighted mean to the biosolid management locations using the following equation

**Assumptions**

25 ton haul truck capacity
365.25 days per year

| Future Biosolids Management Locations (Chapter 3) | | | | | Quantity (wtpy) | | Quantity (wtpd) | | | truck trips per day | | | using low | | using high | | using avg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Facility** | **Management Practice** | **Status** | **Location** | **Distance From JWPCP (miles)** | **low** | **high** | **Low** | **High** | **avg** | **low** | **high** | **avg** | **% of trips** | | **% of trips** | | **% of trips** | | |
| Westlake Farms | Composting | Expected in 2012 | Kings County, CA | 200 | 300,000 | 500,000 | 821.36 | 1,368.93 | 1,095.14 | 33 | 55 | 44 | 67% | 133 | 33% | 67 | 41% | 82 | |
| EnerTech | Renewable Fuel | Operating | Rialto, CA | 75 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 11% | 8 | 10% | 8 | 10% | 8 | |
| South Kern Industrial Center | Composting | Operating | Kern County, CA | 131 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 11% | 15 | 10% | 13 | 10% | 13 | |
| Inland Empire Regional Composting Facility | Composting | Operating | Rancho Cucamonga, CA | 59 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 11% | 7 | 10% | 6 | 10% | 6 | |
| San Joaquin Composting Facility | Composting | Operating | Kern County, CA | 170 | 0 | 150,000 | 0.00 | 410.68 | 205.34 | 0 | 16 | 8 | 0% | 0 | 10% | 17 | 8% | 13 | |
| Desert Ridge Farms | Land Application | Operating | Yuma County, AZ | 300 | 0 | 150,000 | 0.00 | 410.68 | 205.34 | 0 | 16 | 8 | 0% | 0 | 10% | 30 | 8% | 23 | |
| Honey Bucket Farms | Land Application w/ Lime Stabilization | Operating | Kern County, CA | 160 | 0 | 150,000 | 0.00 | 410.68 | 205.34 | 0 | 16 | 8 | 0% | 0 | 10% | 16 | 8% | 12 | |
| Mitsubishi Cement Corp | Injection for $NO_x$ Control | Operating | San Bernardino County, CA | 129 | 0 | 100,000 | 0.00 | 273.79 | 136.89 | 0 | 11 | 5 | 0% | 0 | 7% | 9 | 5% | 7 | |
| | | | total | | 450,000 | 1,500,000 | 1,232 | 4,107 | 2,669 | 49 | 164 | 107 | | **163** | | **165** | | **164** | **Miles (Weighted Mean)** |

| Existing Biosolids Management Practices (Chapter 2) | | | | | Quantity (wtpy) | | Quantity (wtpd) | | | truck trips per day | | | using low | | using high | | using avg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Facility** | **Management Practice** | **Status** | **Location** | **Distance From JWPCP (miles)** | **low** | **high** | **low** | **high** | **avg** | **low** | **high** | **avg** | **% of trips** | | **% of trips** | | **% of trips** | | |
| San Joaquin Composting Facility | Composting | Operating | Kern County, CA | 170 | 50,000 | 150,000 | 136.89 | 410.68 | 273.79 | 5 | 16 | 11 | 18% | 30 | 20% | 34 | 20% | 33 | |
| South Kern Industrial Center | Composting | Operating | Kern County, CA | 131 | 50,000 | 75,000 | 136.89 | 205.34 | 171.12 | 5 | 8 | 7 | 18% | 23 | 10% | 13 | 12% | 16 | |
| Inland Empire Regional Composting Facility | Composting | Operating | Rancho Cucamonga, CA | 59 | 50,000 | 75,000 | 136.89 | 205.34 | 171.12 | 5 | 8 | 7 | 18% | 11 | 10% | 6 | 12% | 7 | |
| Honey Bucket Farms | Land Application w/ Lime Stabilization | Operating | Kern County, CA | 160 | 25,000 | 75,000 | 68.45 | 205.34 | 136.89 | 3 | 8 | 5 | 9% | 14 | 10% | 16 | 10% | 16 | |
| Desert Ridge Farms | Land Application | Operating | Yuma County, AZ | 300 | 25,000 | 75,000 | 68.45 | 205.34 | 136.89 | 3 | 8 | 5 | 9% | 27 | 10% | 30 | 10% | 29 | |
| EnerTech | Renewable Fuel | Operating | Rialto, CA | 75 | 25,000 | 75,000 | 68.45 | 205.34 | 136.89 | 3 | 8 | 5 | 9% | 7 | 10% | 8 | 10% | 7 | |
| Mitsubishi Cement Corp | Injection for $NO_x$ Control | Operating | San Bernardino County, CA | 129 | 5,000 | 15,000 | 13.69 | 41.07 | 27.38 | 1 | 2 | 1 | 2% | 2 | 2% | 3 | 2% | 3 | |
| Puente Hills Landfill | Landfill Co-disposal | Operating | Los Angeles County, CA | 27 | 50,000 | 200,000 | 136.89 | 547.57 | 342.23 | 5 | 22 | 14 | 18% | 5 | 27% | 7 | 25% | 7 | |
| | | | total | | 280,000 | 740,000 | 767 | 2,026 | 1,396 | 31 | 81 | 56 | | **119** | | **118** | | **118** | **Miles (Weighted Mean)** |

## Biosolid Hauling - VMT in each basin

**Methodology**

used Google Earth to map the distance traveled from JWPCP to the various landfills within each basin

output GIS shapefiles into kml file for use

**Assumed Distances**

| | | |
|---|---|---|
| scab north | 86.5 | miles |
| scab south | 56.1 | miles |
| sdab to ssab | 123 | miles |
| ssab to AZ | 94.5 | miles |

| | | | Miles Per Basin per trip | | | | |
|---|---|---|---|---|---|---|---|
| | | | Future | | | | |
| **Future Facility** | **Basin of Facility** | **Distance From JWPCP (miles)** | **SCAB** | **SJV** | **SDAB** | **SSAB** | |
| Westlake Farms | SJV | 200 | 86.5 | 113.5 | -- | -- | |
| EnerTech | SCAB | 75 | 75 | -- | -- | -- | |
| South Kern Industrial Center | SJV | 131 | 86.5 | 44.5 | -- | -- | |
| Inland Empire Regional Composting Facility | SCAB | 59 | 59 | -- | -- | -- | |
| San Joaquin Composting Facility | SJV | 170 | 86.5 | 83.5 | -- | -- | |
| Desert Ridge Farms | AZ | 300 | 56.1 | -- | 123 | 94.5 | 273.6 |
| Honey Bucket Farms | SJV | 160 | 86.5 | 73.5 | -- | -- | |
| Mitsubishi Cement Corp | SCAB | 129 | 129 | -- | -- | -- | |
| | | 1208 | 665.1 | 315 | 123 | 94.5 | |
| | | > weighted distances in each basin | 55.06% | 26.08% | 10.18% | 7.82% | |

| | | | Existing | | | |
|---|---|---|---|---|---|---|
| **Existing Facility** | **Basin of Facility** | **Distance From JWPCP (miles)** | **SCAB** | **SJV** | **SDAB** | **SSAB** |
| San Joaquin Composting Facility | SJV | 170 | 86.5 | 83.5 | -- | -- |
| South Kern Industrial Center | SJV | 131 | 86.5 | 44.5 | -- | -- |
| Inland Empire Regional Composting Facility | SCAB | 59 | 59 | -- | -- | -- |
| Honey Bucket Farms | SJV | 160 | 86.5 | 73.5 | -- | -- |
| Desert Ridge Farms | AZ | 300 | 56.1 | | 123 | 94.5 |
| EnerTech | SCAB | 75 | 75 | -- | -- | -- |
| Mitsubishi Cement Corp | SCAB | 129 | 129 | -- | -- | -- |
| Puente Hills Landfill | SCAB | 27 | 27 | -- | -- | -- |
| | | 1035 | 605.6 | 201.5 | 123 | 94.5 |
| | | > weighted distances in each basin | 58.51% | 19.47% | 11.88% | 9.13% |

## Emission Factors for Biosolid Hauling Trucks

from EMFAC BURDEN mode, for regional hauling and idling

| | Criteria Pollutants | | | | | | GHGs | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 | N20 | CH4 |
| **Pounds per mile** | | | | | | | | | |
| 2008 | 0.0031 | 0.0118 | 0.0397 | 0.0000 | 0.0021 | 0.0018 | 4.0518 | 0.000011 | 0.000011 |
| 2020 | 0.0009 | 0.0042 | 0.0098 | 0.0000 | 0.0006 | 0.0005 | 4.0622 | 0.000011 | 0.000011 |
| 2030 | 0.0005 | 0.0029 | 0.0056 | 0.0000 | 0.0004 | 0.0003 | 4.0566 | 0.000011 | 0.000011 |
| 2040 | 0.0005 | 0.0027 | 0.0052 | 0.0000 | 0.0004 | 0.0003 | 4.0706 | 0.000011 | 0.000011 |
| 2050 | 0.0005 | 0.0027 | 0.0052 | 0.0000 | 0.0004 | 0.0003 | 4.0706 | 0.000011 | 0.000011 |
| **Pounds per idle trip** | | | | | | | | | |
| 2008 | 0.0102 | 0.0368 | 0.0783 | 0.0014 | 0.0016 | 0.0015 | 4.8811 | 0.000013 | 0.000014 |
| 2020 | 0.0063 | 0.0314 | 0.0890 | 0.0016 | 0.0004 | 0.0003 | 4.8822 | 0.000013 | 0.000014 |
| 2030 | 0.0057 | 0.0306 | 0.0905 | 0.0016 | 0.0001 | 0.0001 | 4.8464 | 0.000013 | 0.000013 |
| 2040 | 0.0056 | 0.0304 | 0.0908 | 0.0016 | 0.0001 | 0.0001 | 4.8791 | 0.000013 | 0.000014 |
| 2050 | 0.0056 | 0.0304 | 0.0908 | 0.0016 | 0.0001 | 0.0001 | 4.8791 | 0.000013 | 0.000014 |

from EMFAC, 5mph, for onsite travel

| | Criteria Pollutants | | | | | | GHGs | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 | N20 | CH4 |
| **Pounds per mile** | | | | | | | | | |
| 2008 | 0.0299 | 0.0655 | 0.0988 | 0.0001 | 0.0070 | 0.0064 | 8.3544 | 0.000011 | 0.000011 |
| 2020 | 0.0093 | 0.0213 | 0.0276 | 0.0001 | 0.0011 | 0.0009 | 8.4350 | 0.000011 | 0.000011 |
| 2030 | 0.0056 | 0.0138 | 0.0165 | 0.0001 | 0.0004 | 0.0003 | 8.4461 | 0.000011 | 0.000011 |
| 2040 | 0.0052 | 0.0129 | 0.0153 | 0.0001 | 0.0003 | 0.0002 | 8.4475 | 0.000011 | 0.000011 |
| 2050 | 0.0052 | 0.0129 | 0.0153 | 0.0001 | 0.0003 | 0.0002 | 8.4475 | 0.000011 | 0.000011 |

N2O and CH4 emission factors from General Reporting Protocol, Version 3.1. (Jan 2009)

| | grams/mi | lbs/mile | GHG ratio to CO2 for idling calcs |
|---|---|---|---|
| CH4 | 0.0051 | 1.12436E-05 | 2.77495E-06 |
| N2O | 0.0048 | 1.05822E-05 | 2.61171E-06 |

(Table C.4)

*grams per pound* *453.59*

Road Dust (EPA AP-42, Section 13.2.1 Paved Roads, November 2006)

| | PM10 | PM2.5 |
|---|---|---|
| pounds per mile | 0.021722332 | 0.00325835 |

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS REGIONAL TRAVEL

## EMFAC 2007 regional hauling emission factors - 2008

Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

**********

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 49391 | | | | |
| VMT/1000 | 9028 | 9028000 | | | |
| Trips | 249946 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 14.12 | | 28240 | 0.003128046 | |
| Idle Exh | 1.27 | | 2540 | | 0.010162195 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 15.39 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 15.39 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 53.11 | | 106220 | 0.011765618 | |
| Idle Exh | 4.6 | | 9200 | | 0.036807951 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 57.71 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 179.14 | | 358280 | 0.039685423 | |
| Idle Exh | 9.79 | | 19580 | | 0.078336921 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 188.93 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 18.29 | | 36580000 | 4.051838724 | |
| Idle Exh | 0.61 | | 1220000 | | 4.881054308 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 18.9 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 8.73 | | 17460 | 0.001933983 | |
| Idle Exh | 0.2 | | 400 | | 0.001600346 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 8.93 | | | | |
| | | | | | |
| TireWear | 0.36 | | 720 | 7.97519E-05 | |
| BrakeWr | 0.28 | | 560 | 6.20292E-05 | |
| | ------- | | | | |
| Total | 9.57 | | | | |
| Lead | 0 | | | | |
| SOx | 0.18 | | 360 | 3.98759E-05 | 0.001440311 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 1700.79 | | | | |

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS REGIONAL TRAVEL

## EMFAC 2007 regional hauling emission factors - 2020

Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

**********

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 65570 | | | | |
| VMT/1000 | 13761 | 13761000 | | | |
| Trips | 331816 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.23 | | 12460 | 0.000905457 | |
| Idle Exh | 1.04 | | 2080 | | 0.006268534 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 7.28 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 7.28 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 28.7 | | 57400 | 0.004171208 | |
| Idle Exh | 5.21 | | 10420 | | 0.031402946 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 33.92 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 67.65 | | 135300 | 0.009832134 | |
| Idle Exh | 14.76 | | 29520 | | 0.088964969 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 82.41 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 27.95 | | 55900000 | 4.062204782 | |
| Idle Exh | 0.81 | | 1620000 | | 4.882223883 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 28.76 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.3 | | 6600 | 0.000479616 | |
| Idle Exh | 0.06 | | 120 | | 0.000361646 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 3.36 | | | | |
| | | | | | |
| TireWear | 0.55 | | 1100 | 7.99361E-05 | |
| BrakeWr | 0.43 | | 860 | 6.24955E-05 | |
| | ------- | | | | |
| Total | 4.33 | | | | |
| Lead | 0 | | | | |
| SOx | 0.27 | | 540 | 3.92413E-05 | 0.001627408 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2588.03 | | | | |

# EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS REGIONAL TRAVEL

## EMFAC 2007 regional hauling emission factors - 2030

Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

**********

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 82364 | | | | |
| VMT/1000 | 17044 | 17044000 | | | |
| Trips | 416803 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 4.62 | | 9240 | 0.000542126 | |
| Idle Exh | 1.19 | | 2380 | | 0.005710132 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 5.81 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | --- | | | | |
| Total | 5.81 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 24.37 | | 48740 | 0.002859657 | |
| Idle Exh | 6.37 | | 12740 | | 0.030565999 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 30.75 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 47.87 | | 95740 | 0.005617226 | |
| Idle Exh | 18.87 | | 37740 | | 0.090546373 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 66.74 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 34.57 | | 69140000 | 4.056559493 | |
| Idle Exh | 1.01 | | 2020000 | | 4.846414253 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 35.58 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.3 | | 4600 | 0.00026989 | |
| Idle Exh | 0.03 | | 60 | | 0.000143953 |
| Start Ex | 0 | | | | |
| | --- | | | | |
| Total Ex | 2.32 | | | | |
| | | | | | |
| TireWear | 0.68 | | 1360 | 7.97935E-05 | |
| BrakeWr | 0.53 | | 1060 | 6.2192E-05 | |
| | --- | | | | |
| Total | 3.53 | | | | |
| Lead | 0 | | | | |
| SOx | 0.34 | | 680 | 3.98967E-05 | 0.001631466 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 3202.33 | | | | |

## EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS REGIONAL TRAVEL

### EMFAC 2007 regional hauling emission factors - 2040

Title : South Coast AQMD Avg Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/04 16:22:34
Scen Year: 2040 -- All model years in the range 1996 to 2040 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

**********

| | HHDT-DSL | | lbs/day | lbs/mile | lbs/trip |
|---|---|---|---|---|---|
| Vehicles | 104492 | | | | |
| VMT/1000 | 21594 | 21594000 | | | |
| Trips | 528782 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.54 | | 11080 | 0.000513105 | |
| Idle Exh | 1.49 | | 2980 | | 0.005635593 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 7.03 | | | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 7.03 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 28.92 | | 57840 | 0.002678522 | |
| Idle Exh | 8.05 | | 16100 | | 0.03044733 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 36.98 | | | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 56.22 | | 112440 | 0.005207002 | |
| Idle Exh | 24 | | 48000 | | 0.090774648 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 80.22 | | | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 43.95 | | 87900000 | 4.07057516 | |
| Idle Exh | 1.29 | | 2580000 | | 4.879137338 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 45.23 | | | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.61 | | 5220 | 0.000241734 | |
| Idle Exh | 0.02 | | 40 | | 7.56455E-05 |
| Start Ex | 0 | | | | |
| | ------- | | | | |
| Total Ex | 2.64 | | | | |
| | | | | | |
| TireWear | 0.86 | | 1720 | 7.96518E-05 | |
| BrakeWr | 0.67 | | 1340 | 6.20543E-05 | |
| | ------- | | | | |
| Total | 4.17 | | | | |
| Lead | 0 | | | | |
| SOx | 0.43 | | 860 | 3.98259E-05 | 0.001626379 |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 4070.99 | | | | |

**EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS ONSITE TRAVEL**

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 6/10/2010 10:30:42
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2008 -- Model Years 1965 to 2008 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 13.564 | 0 | 0 | 13.564 |

Pollutant Name: Carbon Monoxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 29.699 | 0 | 0 | 29.699 |

Pollutant Name: Oxides of Nitrogen Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 44.8 | 0 | 0 | 44.8 |

Pollutant Name: Carbon Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3789.508 | 0 | 0 | 3789.508 |

Pollutant Name: Sulfur Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 Temperature 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.127 | 0 | 0 | 3.127 |

Pollutant Name: PM10 - Tire Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.035 | 0 | 0 | 0.035 |

Pollutant Name: PM10 - Brake Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.088 | 0 | 0 | 3.088 |

Pollutant Name: Diesel - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

**EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS ONSITE TRAVEL**

## EMFAC 2007 on-site hauling emission factor - 2020

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 6/10/2010 10:30:42
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 4.219 | 0 | 0 | 4.219 |

Pollutant Name: Carbon Monoxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 9.641 | 0 | 0 | 9.641 |

Pollutant Name: Oxides of Nitrogen Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 12.504 | 0 | 0 | 12.504 |

Pollutant Name: Carbon Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3826.031 | 0 | 0 | 3826.031 |

Pollutant Name: Sulfur Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.037 | 0 | 0 | 0.037 |

Pollutant Name: PM10 Temperature 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.424 | 0 | 0 | 0.424 |

Pollutant Name: PM10 - Tire Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 - Brake Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.182 | 0 | 0 | 3.182 |

Pollutant Name: Diesel - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

**EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS ONSITE TRAVEL**

## EMFAC 2007 on-site hauling emission factor - 2030

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 6/10/2010 10:30:42
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.553 | 0 | 0 | 2.553 |

Pollutant Name: Carbon Monoxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 6.275 | 0 | 0 | 6.275 |

Pollutant Name: Oxides of Nitrogen Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 7.488 | 0 | 0 | 7.488 |

Pollutant Name: Carbon Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3831.069 | 0 | 0 | 3831.069 |

Pollutant Name: Sulfur Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.037 | 0 | 0 | 0.037 |

Pollutant Name: PM10 Temperature 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.111 | 0 | 0 | 0.111 |

Pollutant Name: PM10 - Tire Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 - Brake Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.254 | 0 | 0 | 3.254 |

Pollutant Name: Diesel - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

**EMFAC 2007 EMISSION FACTORS - HEAVY DUTY BIOSOLIDS HAULING TRUCKS ONSITE TRAVEL**

## EMFAC 2007 on-site hauling emission factor - 2040

Title : South Coast AQMD Subarea Annual 5 CYrs 2008 to 2040 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 6/10/2010 10:30:42
Scen Year: 2040 -- All model years in the range 1996 to 2040 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2040 -- Model Years 1996 to 2040 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.371 | 0 | 0 | 2.371 |

Pollutant Name: Carbon Monoxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 5.859 | 0 | 0 | 5.859 |

Pollutant Name: Oxides of Nitrogen Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 6.931 | 0 | 0 | 6.931 |

Pollutant Name: Carbon Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3831.709 | 0 | 0 | 3831.709 |

Pollutant Name: Sulfur Dioxide Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.037 | 0 | 0 | 0.037 |

Pollutant Name: PM10 Temperature 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.09 | 0 | 0 | 0.09 |

Pollutant Name: PM10 - Tire Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.036 | 0 | 0 | 0.036 |

Pollutant Name: PM10 - Brake Wear Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0.028 | 0 | 0 | 0.028 |

Pollutant Name: Gasoline - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 3.269 | 0 | 0 | 3.269 |

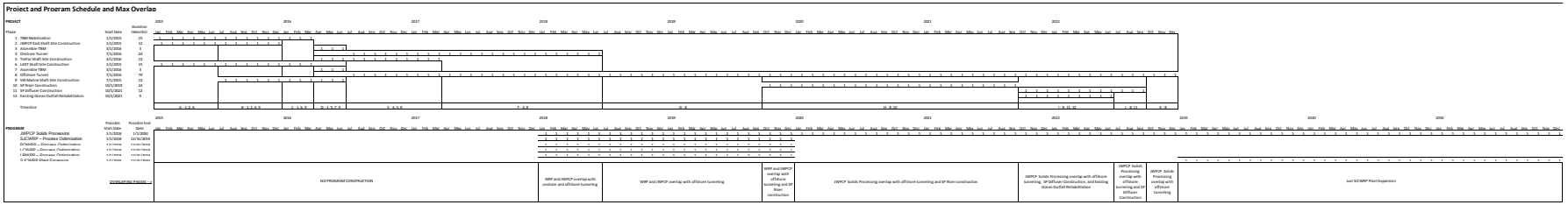
Pollutant Name: Diesel - mi/gal Temperatu 60F Relative Humidity: 50%

| Speed MPH | LDA | LDT | MDT | HDT | UBUS | MCY | ALL |
|---|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 2.621 | 0 | 0 | 2.621 |

# Project Construction GHG Calculations

# Alternative 1

## Project and Proeram Schedule and Max Overlap







UNMITIGATED

**PROJECT EMISSION CALCULATIONS**

Phase

**1 TBM Mobilization**

Start Date 2015

| Equipment | Type | Equipment Specs: HP | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Unmitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.6 | 3.8 | 4.3 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.5 | 1.8 | 4.0 | 0.0 | 0.2 | 0.1 | 549.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.5 | 3.3 | 4.0 | 0.0 | 0.2 | 0.2 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.4 | 1.2 | 2.8 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.4 | 1.2 | 3.2 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | offroad | 349 | 349 | 0.54 | 0 | 6 | 0 | 0.4 | 1.4 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.4 | 1.3 | 3.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.6 | 3.8 | 4.2 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.4 | 1.3 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.2 | 1.0 | 1.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.5 | 1.4 | 5.3 | 0.0 | 0.2 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.4 | 1.3 | 3.5 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.2 | 5.0 | 4.1 | 0.0 | 0.1 | 0.1 | 915.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.3 | 2.6 | 4.7 | 0.0 | 0.1 | 0.1 | 35.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.3 | 1.2 | 3.3 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Tons Soil | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | 0 | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily | Miles / | Acres Disturbed | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 0 | 0 | | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | 0 | | | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 0 | 0 | | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 0 | | | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Equipment | Backhoe/L | Change | Crawler | Forklift | Gantry | Hydaulic | Hydaulic | Motor | Office | Shaft and | Shaft | Shop | Shop | Site | Slurry | Slurry | Slurry | Street | TBM & | Tower | Tunnel | Water | Worker Hoist | Tugboats | Tugboat - | Crew Boats | Crew | Crane | Pipe | Dump | Generato | Service | Locomoti | Hoist | Pump |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number Active | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase

**2 JWPCP East Shaft**

Start Date 2015

| Equipment | Type | Equipment Specs: HP | Power | LF | Number | Equipment | Daily Hp- | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 2 | 6 | 3840 | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.8 | 14.9 | 5.1 | 0.0 | 0.7 | 0.6 | 4652.6 | 0.1 | 0.0 | 4654.0 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 1 | 12 | 3543.12 | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.5 | 9.4 | 3.3 | 0.0 | 0.4 | 0.4 | 4439.1 | 0.0 | 0.0 | 4440.1 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 1 | 8 | 957.6 | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.2 | 2.6 | 1.0 | 0.0 | 0.1 | 0.1 | 1199.7 | 0.0 | 0.0 | 1200.0 |
| Loader | offroad | 349 | 349 | 0.54 | 2 | 6 | 2261.52 | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.4 | 6.9 | 2.5 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.1 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 1 | 6 | 947.94 | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.2 | 2.8 | 1.2 | 0.0 | 0.2 | 0.1 | 1187.6 | 0.0 | 0.0 | 1188.0 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | offroad | 189 | 189 | 0.57 | 1 | 8 | 861.84 | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.1 | 2.4 | 1.0 | 0.0 | 0.1 | 0.1 | 1079.8 | 0.0 | 0.0 | 1080.1 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Tons Soil | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | 3250 | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| | | | | | | | | | | | | On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.4 | 40.1 | 17.0 | 0.2 | 2.4 | 1.8 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Daily | Miles / | Acres Disturbed | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 130 | 7800 | | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | 130 | | | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 20 | 400 | | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | 20 | | | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| | | | | | | | | | | | | | Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase

3 Assemble TBM

Start Date 2016

| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp- | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 0 | 6 | 0 | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |
| | | Daily Trips | | Tons Soil | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | - | | | | | | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | | | | | | | | 0.000166 | 0.0000249 | | | |
| | | | Daily | | Miles / | Acres Disturbed | | | | | | | | | | |
| On-Road Truck | onroad | | 0 | | 0 | | | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | | | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | | 0 | | 0 | | | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 0 | | | | | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Phase

4 Onshore Tunnel

Start Date 2016

| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 1 | 24 | 384 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 1 | 12 | 4800 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 2 | 6 | 1044 | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 1 | 3 | 480 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 2 | 6 | 2261.52 | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 1 | 24 | 1344 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 1 | 24 | 3360 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 1 | 8 | 640 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 1 | 12 | 720 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 1 | 6 | 360 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 1 | 24 | 192 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 1 | 12 | 59520 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 1 | 12 | 28800 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 1 | 19 | 60800 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 1 | 12 | 734.4 | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 1 | 12 | 26880 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 1 | 10 | 2400 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 1 | 24 | 71040 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 1 | 3 | 84 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 5 | 12 | 11100 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |
| | | Daily Trips | | Tons Soil | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | 222 | | | | | | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 5550 | | | | | | | | 0.000166 | 0.0000249 | | | |
| | | | Daily | | Miles / | Acres Disturbed | | | | | | | | | | |
| On-Road Truck | onroad | | 222 | | 13320 | | | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 222 | | | | | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | | 240 | | 4800 | | | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 240 | | | | | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 261.5 | 0.0 | 0.0 | 262.5 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3268.8 | 0.1 | 0.0 | 3280.9 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.2 | 7.6 | 1.2 | 0.0 | 0.4 | 0.3 | 1308.0 | 0.0 | 0.0 | 1308.4 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 326.9 | 0.0 | 0.0 | 328.1 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.3 | 6.7 | 2.3 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 915.3 | 0.0 | 0.0 | 918.7 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2288.2 | 0.1 | 0.0 | 2296.6 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 435.8 | 0.0 | 0.0 | 437.5 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 490.3 | 0.0 | 0.0 | 492.1 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 245.2 | 0.0 | 0.0 | 246.1 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 130.8 | 0.0 | 0.0 | 131.2 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 40533.0 | 1.7 | 0.4 | 40683.3 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19612.8 | 0.8 | 0.2 | 19685.5 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41404.7 | 1.7 | 0.4 | 41558.3 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.1 | 6.1 | 1.0 | 0.0 | 0.3 | 0.2 | 920.1 | 0.0 | 0.0 | 920.3 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18305.2 | 0.8 | 0.2 | 18373.1 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1634.4 | 0.1 | 0.0 | 1640.5 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 48378.1 | 2.0 | 0.4 | 48557.5 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 57.2 | 0.0 | 0.0 | 57.4 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.6 | 63.6 | 7.3 | 0.1 | 0.4 | 0.4 | 855.4 | 0.0 | 0.0 | 863.2 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck - Idle | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | | 0.92 | 0.14 | | | | | | | | | 0.92 | 0.14 | | | | |
| **On Site Total** | **10.7** | **85.7** | **148.2** | **0.2** | **5.9** | **5.0** | **184474.9** | **7.8** | **1.7** | **185151.2** | **4.7** | **85.7** | **16.7** | **0.2** | **2.2** | **1.3** | **184474.9** | **7.5** | **1.7** | **185145.1** |
| On-Road Truck | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| **Total** | **32** | **183** | **371** | **1** | **18** | **15** | **243611** | **8** | **2** | **244480** | **16** | **147** | **125** | **1** | **8** | **5** | **243611** | **8** | **2** | **244474** |

Phase
5 TraPac Shaft Site
Start Date
2016

| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp- | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 2 | 6 | 3840 | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 | 3.92 | 14.12 | 31.41 | 0.05 | 1.20 | 1.07 | 4652.56 | 0.35 | 0.00 | 4659.98 | 0.7 | 14.1 | 4.7 | 0.0 | 0.7 | 0.6 | 4652.6 | 0.1 | 0.0 | 4653.9 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 1 | 12 | 3543.12 | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 | 2.84 | 9.21 | 19.54 | 0.04 | 0.70 | 0.62 | 4439.05 | 0.26 | 0.00 | 4444.44 | 0.5 | 9.2 | 2.9 | 0.0 | 0.4 | 0.3 | 4439.1 | 0.0 | 0.0 | 4440.0 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 1 | 8 | 957.6 | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 | 0.80 | 2.56 | 5.99 | 0.01 | 0.20 | 0.18 | 1199.74 | 0.07 | 0.00 | 1201.26 | 0.1 | 2.6 | 0.9 | 0.0 | 0.1 | 0.1 | 1199.7 | 0.0 | 0.0 | 1200.0 |
| Loader | offroad | 349 | 349 | 0.54 | 2 | 6 | 2261.52 | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.3 | 6.7 | 2.3 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.0 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 1 | 6 | 947.94 | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 | 0.87 | 2.71 | 7.27 | 0.01 | 0.25 | 0.22 | 1187.64 | 0.08 | 0.00 | 1189.28 | 0.2 | 2.7 | 1.1 | 0.0 | 0.1 | 0.1 | 1187.6 | 0.0 | 0.0 | 1187.9 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | offroad | 189 | 189 | 0.57 | 1 | 8 | 861.84 | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 | 0.77 | 2.37 | 5.67 | 0.01 | 0.19 | 0.17 | 1079.77 | 0.07 | 0.00 | 1081.22 | 0.1 | 2.4 | 0.9 | 0.0 | 0.1 | 0.1 | 1079.8 | 0.0 | 0.0 | 1080.0 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| | | Daily Trips | Tons Soil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | 3250 | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| On Site Total | | | | | | | | | | | | | 11.3 | 38.7 | 87.8 | 0.2 | 3.6 | 2.8 | 15550.2 | 1.0 | 0.0 | 15571.2 | 2.3 | 38.7 | 15.6 | 0.2 | 2.2 | 1.6 | 15550.2 | 0.2 | 0.0 | 15554.0 |

| | | Daily | Miles / | Acres Disturbed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 130 | 7800 | | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 10.66 | 44.92 | 121.07 | 0.31 | 7.05 | 5.84 | 31697.93 | 0.09 | 0.08 | 31725.36 | 4.88 | 24.36 | 53.53 | 0.30 | 2.93 | 2.04 | 31697.93 | 0.09 | 0.08 | 31725.36 |
| On-Road Truck | onroad | 130 | | | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.91 | 4.22 | 11.31 | 0.00 | 0.08 | 0.08 | 629.25 | 0.00 | 0.00 | 629.25 | 0.73 | 3.95 | 11.81 | 0.00 | 0.00 | 0.00 | 629.25 | 0.00 | 0.00 | 629.25 |
| On-Road Crew Vehicle | onroad | 20 | 400 | | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 |
| On-Road Crew Vehicle | onroad | 20 | | | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 |
| Total | | | | | | | | | | | | | | 23 | 88 | 217 | 0 | 11 | 9 | 48069 | 1 | 0 | 48130 | 8 | 67 | 78 | 0 | 5 | 4 | 48069 | 0 | 0 | 48113 |

| Equipment | Backhoe/L | Change | Crawler | Forklift | Gantry | Hydaulic | Hydaulic | Motor | Office | Shaft and | Shaft | Shop | Shop | Site | Slurry | Slurry | Slurry | Street | TBM & | Tower | Tunnel | Water | Worker Hoist | Tugboats | Tugboat - | Crew Boats | Crew | Crane | Pipe | Dump | Generato | Service | Locomoti | Hoist | Pump |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number Active | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase
6 LAXT Shaft Site
Start Date
2015

| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp- | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 2 | 6 | 3840 | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.8 | 14.9 | 5.1 | 0.0 | 0.7 | 0.6 | 4652.6 | 0.1 | 0.0 | 4654.0 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 1 | 12 | 3543.12 | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.5 | 9.4 | 3.3 | 0.0 | 0.4 | 0.4 | 4439.1 | 0.0 | 0.0 | 4440.1 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 1 | 8 | 957.6 | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.2 | 2.6 | 1.0 | 0.0 | 0.1 | 0.1 | 1199.7 | 0.0 | 0.0 | 1200.0 |
| Loader | offroad | 349 | 349 | 0.54 | 2 | 6 | 2261.52 | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.4 | 6.9 | 2.5 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.1 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 1 | 6 | 947.94 | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.2 | 2.8 | 1.2 | 0.0 | 0.2 | 0.1 | 1187.6 | 0.0 | 0.0 | 1188.0 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | offroad | 189 | 189 | 0.57 | 1 | 8 | 861.84 | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.1 | 2.4 | 1.0 | 0.0 | 0.1 | 0.1 | 1079.8 | 0.0 | 0.0 | 1080.1 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| | | Daily Trips | Tons Soil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | 3250 | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| On Site Total | | | | | | | | | | | | | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.4 | 40.1 | 17.0 | 0.2 | 2.4 | 1.8 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| | | Daily | Miles / | Acres Disturbed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 130 | 7800 | | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | 130 | | | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 20 | 400 | | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | 20 | | | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| Total | | | | | | | | | | | | | | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase

7 Assemble TBM
Start Date 2016

| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp- | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 0 | 6 | 0 | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Tons Soil | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | 0 | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily | Miles / | Acres Disturbed | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 0 | 0 | | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | 0 | | | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 0 | 0 | | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 0 | | | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase

8 Offshore Tunnel
Start Date 2016

| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp- | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 1 | 24 | 384 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 1 | 12 | 4800 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 2 | 6 | 1044 | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 1 | 3 | 480 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 2 | 6 | 2261.52 | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 1 | 24 | 1344 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 200 | 1.00 | 1 | 24 | 4800 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 1 | 8 | 640 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 1 | 12 | 720 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 1 | 6 | 360 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 1 | 24 | 192 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 8.000 | 1.00 | 1 | 12 | 96000 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 3.760 | 1.00 | 1 | 12 | 45120 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 1 | 19 | 60800 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 1 | 12 | 734.4 | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 1 | 12 | 26880 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 1 | 10 | 2400 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 3.600 | 1.00 | 1 | 24 | 86400 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 1 | 3 | 84 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 5 | 12 | 11100 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 261.5 | 0.0 | 0.0 | 262.5 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3268.8 | 0.1 | 0.0 | 3280.9 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.2 | 7.6 | 1.2 | 0.0 | 0.4 | 0.3 | 1308.0 | 0.0 | 0.0 | 1308.4 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 326.9 | 0.0 | 0.0 | 328.1 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.3 | 6.7 | 2.3 | 0.0 | 0.3 | 0.3 | 2833.4 | 0.0 | 0.0 | 2834.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 915.3 | 0.0 | 0.0 | 918.7 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3268.8 | 0.1 | 0.0 | 3280.9 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 435.8 | 0.0 | 0.0 | 437.5 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 490.3 | 0.0 | 0.0 | 492.1 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 245.2 | 0.0 | 0.0 | 246.1 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 130.8 | 0.0 | 0.0 | 131.2 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 65375.9 | 2.7 | 0.6 | 65618.3 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30726.7 | 1.3 | 0.3 | 30840.6 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41404.7 | 1.7 | 0.4 | 41558.3 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.1 | 6.1 | 1.0 | 0.0 | 0.3 | 0.2 | 920.1 | 0.0 | 0.0 | 920.3 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18305.2 | 0.8 | 0.2 | 18373.1 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1634.4 | 0.1 | 0.0 | 1640.5 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 58838.3 | 2.4 | 0.5 | 59056.5 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 57.2 | 0.0 | 0.0 | 57.4 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.6 | 63.6 | 7.3 | 0.1 | 0.4 | 0.4 | 855.4 | 0.0 | 0.0 | 863.2 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Daily Trips | Tons Soil | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 282 | | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 |
| Fugitive Dust | | | 7050 | | | | | 0.000166 | 0.0000249 | | | | | | | | 1.17 | 0.18 | | | | | | | | | 1.17 | 0.18 | | | | |
| | | | | | | | | | | | | On Site Total | 10.8 | 86.2 | 149.5 | 0.2 | 6.2 | 5.0 | 231945.3 | 9.8 | 2.1 | 232797.4 | 4.8 | 86.2 | 18.0 | 0.2 | 2.5 | 1.4 | 231945.3 | 9.5 | 2.1 | 232791.4 |

| Equipment | Type | Daily | Miles / | Acres Disturbed | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 282 | 16920 | | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 23.12 | 97.45 | 262.63 | 0.68 | 15.30 | 12.66 | 68760.13 | 0.19 | 0.18 | 68819.63 | 10.58 | 52.84 | 116.11 | 0.64 | 6.36 | 4.42 | 68760.13 | 0.19 | 0.18 | 68819.63 |
| On-Road Truck | onroad | 282 | | | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.97 | 9.15 | 24.53 | 0.00 | 0.18 | 0.17 | 1364.98 | 0.00 | 0.00 | 1364.98 | 1.58 | 8.57 | 25.62 | 0.00 | 0.00 | 0.00 | 1364.98 | 0.00 | 0.00 | 1364.98 |
| On-Road Crew Vehicle | onroad | 240 | 4800 | | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | 240 | | | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| | | | | | | | | | | | | | Total | 37.04 | 206 | 432 | 1 | 22 | 18 | 305929 | 10 | 3 | 306986 | 18 | 161 | 155 | 1 | 9 | 6 | 305929 | 10 | 3 | 306980 |

**Phase 9 — SW Marine Shaft** — Start Date 2015

| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 2 | 6 | 3840 | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 1 | 12 | 3543.12 | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 1 | 8 | 957.6 | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 2 | 6 | 2261.52 | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 1 | 6 | 947.94 | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 1 | 8 | 861.84 | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | 1,300 | 0.31 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | 2,000 | 0.59 | 0 | 8 | 0 | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 0 | 2 | 0 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| | | Daily Trips | Tons Soil | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | | | | |
| Fugitive Dust | | | 3250 | | | | | 0.000166 | 0.0000249 | | | | | | | |

| | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| | | | | | 0.54 | 0.08 | | | | |
| On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 |

| | Daily | Miles / | Acres Disturbed |
|---|---|---|---|
| On-Road Truck | 130 | 7800 | |
| On-Road Truck | 130 | | |
| On-Road Crew Vehicle | 20 | 400 | |
| On-Road Crew Vehicle | 20 | | |

| | | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | |
| On-Road Truck | onroad | 1.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | |
| On-Road Crew Vehicle | onroad | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | |
| On-Road Crew Vehicle | onroad | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | |
| | | | | | | | | | | Total | |

| | | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| | | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 |

| | | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| | | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

| Equipment Number Active | Backhoe/L | Change | Crawler | Forklift | Gantry | Hydaulic | Hydaulic | Motor | Office | Shaft and | Shaft | Shop | Shop | Site | Slurry | Slurry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Slurry | Street | TBM & | Tower | Tunnel | Water | Worker Hoist | Tugboats | Tugboat - | Crew Boats | Crew | Crane | Pipe | Dump | Generato | Service | Locomoti | Hoist | Pump |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Phase 10 — SP Riser** — Start Date 2019

| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 0 | 6 | 0 | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | 1,300 | 0.31 | 3 | 2 | 2418 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 3 | 2 | 147.06 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 3 | 2 | 1080 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 3 | 2 | 64.5 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | 2,000 | 0.59 | 0 | 8 | 0 | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 1 | 2 | 450 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |

| | | Daily Trips | Tons Soil | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 | | | | |
| Fugitive Dust | | | 400 | | | | | 0.000166 | 0.0000249 | | | | | | | |

| | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| | | | | | 0.07 | 0.01 | | | | |
| On Site Total | 2.1 | 46.0 | 37.8 | 0.1 | 1.1 | 0.9 | 8418.5 | 0.0 | 0.4 | 8537.7 |

| | Daily | Miles / | Acres Disturbed |
|---|---|---|---|
| On-Road Truck | 16 | 960 | |
| On-Road Truck | 16 | | |
| On-Road Crew Vehicle | 30 | 600 | |
| On-Road Crew Vehicle | 30 | | |

| | | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 | |
| On-Road Truck | onroad | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 | |
| On-Road Crew Vehicle | onroad | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 | |
| On-Road Crew Vehicle | onroad | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 | |
| | | | | | | | | | | Total | |

| | | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 0.96 | 4.30 | 10.46 | 0.04 | 0.65 | 0.52 | 3899.45 | 0.01 | 0.01 | 3902.82 |
| On-Road Truck | onroad | 0.10 | 0.51 | 1.42 | 0.00 | 0.01 | 0.01 | 77.47 | 0.00 | 0.00 | 77.47 |
| On-Road Crew Vehicle | onroad | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 |
| On-Road Crew Vehicle | onroad | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 |
| | | 3 | 52 | 49 | 0 | 2 | 1 | 12898 | 0 | 0 | 13037 |

| | | ROG | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 0.60 | 2.69 | 6.53 | 0.03 | 0.41 | 0.33 | 3899.45 | 0.01 | 0.01 | 3902.82 |
| On-Road Truck | onroad | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.47 | 0.00 | 0.00 | 77.47 |
| On-Road Crew Vehicle | onroad | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 |
| On-Road Crew Vehicle | onroad | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 |
| | | 3 | 51 | 42 | 0 | 1 | 1 | 12898 | 0 | 0 | 13037 |

Phase

11 SP Diffuser
Start Date
2021

| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp- | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 0 | 6 | 0 | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 2 | 2 | 1612 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 2 | 2 | 98.04 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 1 | 2 | 360 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 1 | 2 | 21.5 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 1 | 8 | 2580 | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 1 | 8 | 9440 | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 2 | 8 | 5920 | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 1 | 2 | 450 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 1 | 4 | 510 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 1 | 8 | 2960 | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |
| | | Daily Trips | | Tons Soil | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | 16 | | | | | | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400 | | | | | | | | 0.000166 | 0.0000249 | | | |
| | | Daily | | Miles / | Acres Disturbed | | | | | | | | | | | |
| On-Road Truck | onroad | 16 | | 960 | | | | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 |
| On-Road Truck | onroad | 16 | | | | | | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 30 | | 600 | | | | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 |
| On-Road Crew Vehicle | onroad | 30 | | | | | | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 |

| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.8 | 17.8 | 14.5 | 0.0 | 0.4 | 0.4 | 3255.0 | 0.0 | 0.1 | 3301.2 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.0 | 1.1 | 0.9 | 0.0 | 0.0 | 0.0 | 198.0 | 0.0 | 0.0 | 200.8 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.2 | 4.0 | 3.2 | 0.0 | 0.1 | 0.1 | 726.9 | 0.0 | 0.0 | 737.2 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 43.4 | 0.0 | 0.0 | 44.0 |
| Crane Barge | 0.86 | 5.70 | 3.38 | 0.03 | 0.10 | 0.09 | 3232.39 | 0.08 | 0.00 | 3234.03 | 0.2 | 5.7 | 0.5 | 0.0 | 0.1 | 0.1 | 3232.4 | 0.0 | 0.0 | 3232.7 |
| Pipe Barge | 7.35 | 24.46 | 76.05 | 0.12 | 1.82 | 1.62 | 11827.05 | 0.66 | 0.00 | 11840.97 | 1.3 | 24.5 | 11.4 | 0.1 | 1.0 | 0.9 | 11827.1 | 0.1 | 0.0 | 11829.6 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 3.85 | 14.31 | 22.92 | 0.07 | 0.84 | 0.75 | 7416.97 | 0.35 | 0.00 | 7424.26 | 0.7 | 14.3 | 3.4 | 0.1 | 0.5 | 0.4 | 7417.0 | 0.1 | 0.0 | 7418.3 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.2 | 5.0 | 0.6 | 0.0 | 0.1 | 0.1 | 908.6 | 0.0 | 0.0 | 921.5 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.33 | 1.27 | 2.20 | 0.01 | 0.07 | 0.07 | 638.96 | 0.03 | 0.00 | 639.58 | 0.1 | 1.3 | 0.3 | 0.0 | 0.0 | 0.0 | 639.0 | 0.0 | 0.0 | 639.1 |
| Pump | 1.30 | 6.65 | 10.84 | 0.04 | 0.36 | 0.32 | 3708.48 | 0.12 | 0.00 | 3710.94 | 0.2 | 6.7 | 1.6 | 0.0 | 0.2 | 0.2 | 3708.5 | 0.0 | 0.0 | 3708.9 |
| On-Road Truck - Idle | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.07 | 0.01 | | | | |
| On Site Total | 15.0 | 80.5 | 138.6 | 0.3 | 3.9 | 3.4 | 31975.2 | 1.3 | 0.2 | 32074.0 | 3.8 | 80.5 | 37.1 | 0.3 | 2.4 | 2.1 | 31975.2 | 0.3 | 0.2 | 32052.7 |
| On-Road Truck | 0.80 | 3.75 | 8.59 | 0.04 | 0.55 | 0.42 | 3909.79 | 0.01 | 0.01 | 3913.16 | 0.60 | 3.00 | 6.17 | 0.04 | 0.38 | 0.27 | 3909.79 | 0.01 | 0.01 | 3913.16 |
| On-Road Truck | 0.10 | 0.50 | 1.43 | 0.00 | 0.01 | 0.01 | 78.10 | 0.00 | 0.00 | 78.10 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.10 | 0.00 | 0.00 | 78.10 |
| On-Road Crew Vehicle | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 |
| On-Road Crew Vehicle | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 |
| Total | 16 | 86 | 148 | 0 | 4 | 4 | 36467 | 1 | 0 | 36585 | 5 | 85 | 44 | 0 | 3 | 2 | 36467 | 0 | 0 | 36564 |

| Equipment | Backhoe/L | Change | Crawler | Forklift | Gantry | Hydaulic | Hydaulic | Motor | Office | Shaft and | Shaft | Shop | Shop | Site | Slurry | Slurry | Slurry | Street | TBM & | Tower | Tunnel | Water | Worker Hoist | Tugboats | Tugboat - | Crew Boats | Crew | Crane | Pipe | Dump | Generato | Service | Locomoti | Hoist | Pump |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number Active | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 1 | 1 |

Phase

12 Existing Ocean
Start Date
2021

| | | Equipment Specs | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | Power | LF | Number | Equipment | Daily Hp- | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | 120 | 0.55 | 0 | 18 | 0 | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | offroad | - | 16 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | 500 | 0.64 | 0 | 6 | 0 | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | offroad | 145 | 145 | 0.60 | 0 | 6 | 0 | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | offroad | | 160 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | 518 | 0.57 | 0 | 12 | 0 | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | 210 | 0.57 | 0 | 8 | 0 | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | offroad | 349 | 349 | 0.54 | 0 | 6 | 0 | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | offroad | 259 | 259 | 0.61 | 0 | 6 | 0 | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | offroad | - | 56 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 1.00 | 0 | 8 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 1.00 | 0 | 6 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 1.00 | 0 | 19 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | 90 | 0.68 | 0 | 12 | 0 | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 1.00 | 0 | 12 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 1.00 | 0 | 10 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 1.00 | 0 | 24 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | 189 | 0.57 | 0 | 8 | 0 | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | offroad | - | 28 | 1.00 | 0 | 3 | 0 | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | 1.300 | 0.31 | 2 | 2 | 1612 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | 57 | 0.43 | 2 | 2 | 98.04 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | 400 | 0.45 | 1 | 2 | 360 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | 25 | 0.43 | 1 | 2 | 21.5 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | 750 | 0.43 | 0 | 8 | 0 | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | offroad | 2.000 | 2.000 | 0.59 | 0 | 8 | 0 | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | offroad | 250 | 250 | 0.51 | 0 | 8 | 0 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | offroad | 500 | 500 | 0.45 | 1 | 2 | 450 | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | 185 | 1.00 | 0 | 12 | 0 | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | 250 | 0.51 | 0 | 4 | 0 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | offroad | 500 | 500 | 0.74 | 0 | 8 | 0 | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |
| | | Daily Trips | | Tons Soil | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | - | | | | | | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | | | | | | | | 0.000166 | 0.0000249 | | | |
| | | Daily | | Miles / | Acres Disturbed | | | | | | | | | | | |
| On-Road Truck | onroad | 0 | | 0 | | | | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 |
| On-Road Truck | onroad | 0 | | | | | | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | | 400 | | | | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 |
| On-Road Crew Vehicle | onroad | 20 | | | | | | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 |

| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.8 | 17.8 | 14.5 | 0.0 | 0.4 | 0.4 | 3255.0 | 0.0 | 0.1 | 3301.2 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.0 | 1.1 | 0.9 | 0.0 | 0.0 | 0.0 | 198.0 | 0.0 | 0.0 | 200.8 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.2 | 4.0 | 3.2 | 0.0 | 0.1 | 0.1 | 726.9 | 0.0 | 0.0 | 737.2 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 43.4 | 0.0 | 0.0 | 44.0 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.2 | 5.0 | 0.6 | 0.0 | 0.1 | 0.1 | 908.6 | 0.0 | 0.0 | 921.5 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 1.3 | 28.0 | 22.9 | 0.0 | 0.6 | 0.6 | 5131.9 | 0.0 | 0.2 | 5204.8 | 1.3 | 28.0 | 19.4 | 0.0 | 0.6 | 0.5 | 5131.9 | 0.0 | 0.2 | 5204.7 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 |
| On-Road Crew Vehicle | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 |
| Total | 1 | 29 | 23 | 0 | 1 | 1 | 5481 | 0 | 0 | 5564 | 1 | 29 | 20 | 0 | 1 | 1 | 5481 | 0 | 0 | 5564 |

[a] Per CARB Regulations "A driver of a diesel-fueled motor vehicle with a gross vehicle weight rating (GVWR) greater than 10,000 pounds is prohibited from idling the vehicle's primary engine for more than 5 minutes at any location." Available http://www.arb.ca.gov/enf/diesel.htm#cmvidling.

## GHG'S BY PHASE

| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | 7/1/2016 | 24 | 59,073 | 2 | 1 | 59,284 | 59,073 | 2 | 1 | 59,283 |
| 5 | TraPac Shaft Site Construction | 4/1/2016 | 12 | 5,820 | 0 | 0 | 5,828 | 5,820 | 0 | 0 | 5,825 |
| 6 | LAXT Shaft Site Construction | 1/1/2015 | 15 | 7,272 | 0 | 0 | 7,281 | 7,272 | 0 | 0 | 7,278 |
| 7 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 8 | Offshore Tunnel | 7/1/2016 | 79 | 241,584 | 8 | 2 | 242,419 | 241,584 | 8 | 2 | 242,414 |
| 9 | SW Marine Shaft Site Construction | 7/1/2015 | 12 | 5,833 | 0 | 0 | 5,841 | 5,833 | 0 | 0 | 5,839 |
| 10 | SP Riser Construction | 10/1/2019 | 24 | 3,132 | 0 | 0 | 3,166 | 3,132 | 0 | 0 | 3,166 |
| 11 | SP Diffuser Construction | 10/1/2021 | 12 | 4,415 | 0 | 0 | 4,430 | 4,415 | 0 | 0 | 4,427 |
| 12 | Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 496 | 0 | 0 | 503 | 496 | 0 | 0 | 503 |
| | Total | | | | | | 334,576 | | | | 334,558 |
| | Amortized Total | | | | | | 11,153 | | | | 11,152 |

Conversion: Short Tons to Metric Tons

0.9071847

## Harbor Craft Emission Factors

The NOX, ROG, and PM emission factors for both the unmitigated and mitigated scenarios are based on Tier 3 emission standards for marine vessels
Emission factors use a 95%/5% for NOX + HC, and a conversion factor of 1.053
CO emission factors do not change from Tier 2 to Tier 3. Thus, the CO emission factor is the Tier 2 emission standard
SO2, CO2, N2O, and CH4 use same unmitigated EF's as before

Calendar Year 2010

| | | | | | | | | | | | Unmitigated and Mitigated Criteria Pollutant Emission Factors (g/hp-hr) [2] | | | | | | GHG Emission Factors (g/hp-hr) [3] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Fuel | Average Model Year [1] | Number of Engines per Craft | Hp | kW | Equipment Age (yr) | Average Operating Hours (hr/yr) [1] | Average Useful Life (hr) [1] | Cumulative Hours (hr) | Load Factor (%)[1] | NOx | CO | HC | ROG [4] | PM | SO2 | CO2 | N2O | CH4 |
| Work / Crew Boat (main engine) | diesel | 1997 | 1 | 400 | 298 | 14 | 428 | 7,276 | 5,992 | 0.45 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Work / Crew Boat (auxiliary engine) | diesel | 1992 | 1 | 25 | 19 | 19 | 250 | 5,750 | 4,750 | 0.43 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Tug Boat (main engine) | diesel | 2003 | 2 | 1,300 | 970 | 8 | 668 | 14,028 | 5,344 | 0.31 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Tug Boat (auxiliary engine) | diesel | 1997 | 2 | 57 | 43 | 14 | 700 | 16,100 | 9,800 | 0.43 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Push Tug/Tender (main engine) | diesel | 1996 | 2 | 800 | 597 | 15 | 1,397 | 29,337 | 20,955 | 0.31 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |
| Push Tug/Tender (auxiliary engine) | diesel | 1998 | 2 | 138 | 103 | 13 | 1,253 | 26,313 | 16,289 | 0.43 | 4.09 | 5.00 | 0.22 | 0.23 | 0.11 | 0.006 | 916 | 0.042 | 0.005 |

**Reference:**

[1]: POLB 2008 Inventory, Chapter 3, Emission Factors for Harbor Craft

[2] Emission factors are adjusted for California diesel UL fuel (15 ppm sulfur).

[3] Cooper, David, and Tomas Gustafsson. Methodology for Calculating Emissions from Ships: 1. Update of Emission Factors. Swedish Environmental Protection Agency, Swedish Methodology for Environmental Data. Norrsköping, Sweden. 2004. http://www.smed.se. This is the same source as used by Starcrest C

(4): ROG/HC conversion factor for diesel engines: http://www.epa.gov/otaq/models/nonrdmdl/p03002.pdf

**Equation 3: SOx Emission Factor**

SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF = 0.00552

Where:

X = S content in parts per million (ppm) 15 ppm

BSFC = Brake Specific Fuel Consumption (184 g/bhp-hr per CARB 2007 Harbor Craft Methodology) 184 (g/hp-hr)

MW = Molecular Weight 32 S

## OFFROAD OUTPUT AND EMISSION FACTORS

| | | | | | | | | | | | | | | | | | | | | | Emission Factors (g/hp-hr) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CY | Season | Code | Equipment | Fuel | MaxHP | AveHP | Class | C/R | Pre | Hand | Port | Activity | ROG Exhaust | CO Exhaust | NOX Exhaust | CO2 Exhaust | SO2 Exhaust | PM Exhaust | N2O Exhaust | CH4 Exhaust | Load Factor | ROG | CO | NOX | SO2 | PM10 | PM25 | CO2 | CH4 | N2O |
| 2014 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 6.78E+01 | 4.00E-03 | 1.18E-02 | 3.44E-02 | 5.37E+00 | 6.05E-05 | 1.13E-03 | 0.00E+00 | 3.61E-04 | 0.57 | 0.423 | 1.246 | 3.642 | 0.006 | 0.120 | 0.107 | 568 | 0.038 | 0.000 |
| 2014 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 4.89E+01 | 4.05E-03 | 1.25E-02 | 3.22E-02 | 5.71E+00 | 5.60E-05 | 1.13E-03 | 0.00E+00 | 3.66E-04 | 0.57 | 0.403 | 1.239 | 3.206 | 0.006 | 0.113 | 0.100 | 568 | 0.036 | 0.000 |
| 2014 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.03E+01 | 2.13E-03 | 6.31E-03 | 1.96E-02 | 2.60E+00 | 2.93E-05 | 6.75E-04 | 0.00E+00 | 1.92E-04 | 0.61 | 0.465 | 1.377 | 4.270 | 0.006 | 0.147 | 0.131 | 568 | 0.042 | 0.000 |
| 2014 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.24E+01 | 7.91E-04 | 4.49E-03 | 6.08E-03 | 7.74E-01 | 8.71E-06 | 3.34E-04 | 0.00E+00 | 7.14E-05 | 0.60 | 0.581 | 3.299 | 4.466 | 0.006 | 0.245 | 0.218 | 568 | 0.052 | 0.000 |
| 2014 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.71E+01 | 2.39E-03 | 8.20E-03 | 2.10E-02 | 3.20E+00 | 3.14E-05 | 7.49E-04 | 0.00E+00 | 2.16E-04 | 0.54 | 0.425 | 1.455 | 3.732 | 0.006 | 0.133 | 0.118 | 568 | 0.038 | 0.000 |
| 2014 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.50E+02 | 1.12E-02 | 6.13E-02 | 7.46E-02 | 9.04E+00 | 1.06E-04 | 5.95E-03 | 0.00E+00 | 1.01E-03 | 0.55 | 0.704 | 3.853 | 4.694 | 0.007 | 0.374 | 0.333 | 568 | 0.064 | 0.000 |
| 2014 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.67E+01 | 3.22E-03 | 1.18E-02 | 2.75E-02 | 3.45E+00 | 3.39E-05 | 1.06E-03 | 0.00E+00 | 2.90E-04 | 0.64 | 0.512 | 1.873 | 4.383 | 0.005 | 0.169 | 0.150 | 550 | 0.046 | 0.000 |
| 2014 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.16E+01 | 1.41E-03 | 7.92E-03 | 9.63E-03 | 1.19E+00 | 1.39E-05 | 7.68E-04 | 0.00E+00 | 1.27E-04 | 0.68 | 0.676 | 3.798 | 4.616 | 0.007 | 0.368 | 0.328 | 568 | 0.061 | 0.000 |
| 2014 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.53E+01 | 1.02E-03 | 2.88E-03 | 8.52E-03 | 1.28E+00 | 1.44E-05 | 2.83E-04 | 0.00E+00 | 9.18E-05 | 0.57 | 0.453 | 1.283 | 3.796 | 0.006 | 0.126 | 0.112 | 568 | 0.041 | 0.000 |
| 2014 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.29E+01 | 4.26E-03 | 1.30E-02 | 4.79E-02 | 4.78E+00 | 4.69E-05 | 1.42E-03 | 0.00E+00 | 3.85E-04 | 0.59 | 0.507 | 1.550 | 5.697 | 0.006 | 0.168 | 0.150 | 568 | 0.046 | 0.000 |
| 2014 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 1.27E-05 | 5.39E-05 | 1.20E-04 | 3.05E-02 | 3.00E-07 | 3.93E-06 | 0.00E+00 | 1.14E-06 | 0.43 | 0.235 | 1.003 | 2.233 | 0.006 | 0.073 | 0.065 | 568 | 0.021 | 0.000 |
| 2014 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 1.18E-04 | 3.58E-04 | 1.23E-03 | 1.57E-01 | 1.77E-06 | 3.98E-05 | 0.00E+00 | 1.07E-05 | 0.51 | 0.428 | 1.295 | 4.446 | 0.006 | 0.144 | 0.128 | 568 | 0.039 | 0.000 |
| 2014 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 6.16E-05 | 2.48E-04 | 7.39E-04 | 1.14E-01 | 1.12E-06 | 2.29E-05 | 0.00E+00 | 5.55E-06 | 0.74 | 0.307 | 1.238 | 3.685 | 0.006 | 0.114 | 0.102 | 568 | 0.028 | 0.000 |
| 2014 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 4.03E-04 | 1.29E-03 | 3.83E-03 | 5.54E-01 | 5.44E-06 | 1.32E-04 | 0.00E+00 | 3.64E-05 | 0.74 | 0.413 | 1.323 | 3.924 | 0.006 | 0.136 | 0.121 | 568 | 0.037 | 0.000 |
| 2014 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 9.70E-06 | 2.93E-05 | 1.01E-04 | 1.29E-02 | 1.45E-07 | 3.26E-06 | 0.00E+00 | 8.75E-07 | 0.51 | 0.428 | 1.295 | 4.446 | 0.006 | 0.144 | 0.128 | 568 | 0.039 | 0.000 |
| 2015 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 6.87E+01 | 3.84E-03 | 1.18E-02 | 3.09E-02 | 5.45E+00 | 6.13E-05 | 1.02E-03 | 0.00E+00 | 3.47E-04 | 0.57 | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568 | 0.036 | 0.000 |
| 2015 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 4.96E+01 | 3.91E-03 | 1.23E-02 | 2.89E-02 | 5.79E+00 | 5.68E-05 | 1.03E-03 | 0.00E+00 | 3.53E-04 | 0.57 | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568 | 0.035 | 0.000 |
| 2015 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.07E+01 | 2.04E-03 | 6.20E-03 | 1.79E-02 | 2.64E+00 | 2.97E-05 | 6.15E-04 | 0.00E+00 | 1.84E-04 | 0.61 | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568 | 0.040 | 0.000 |
| 2015 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.26E+01 | 7.43E-04 | 4.55E-03 | 5.54E-03 | 7.85E-01 | 8.84E-06 | 3.03E-04 | 0.00E+00 | 6.70E-05 | 0.60 | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568 | 0.049 | 0.000 |
| 2015 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.74E+01 | 2.30E-03 | 7.96E-03 | 1.93E-02 | 3.25E+00 | 3.19E-05 | 6.85E-04 | 0.00E+00 | 2.08E-04 | 0.54 | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568 | 0.036 | 0.000 |
| 2015 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.54E+02 | 1.03E-02 | 6.17E-02 | 6.89E-02 | 9.16E+00 | 1.07E-04 | 5.26E-03 | 0.00E+00 | 9.31E-04 | 0.55 | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568 | 0.058 | 0.000 |
| 2015 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.70E+01 | 3.10E-03 | 1.12E-02 | 2.57E-02 | 3.50E+00 | 3.43E-05 | 9.86E-04 | 0.00E+00 | 2.80E-04 | 0.64 | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 550 | 0.044 | 0.000 |
| 2015 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.26E+01 | 1.28E-03 | 8.09E-03 | 8.93E-03 | 1.22E+00 | 1.43E-05 | 6.66E-04 | 0.00E+00 | 1.15E-04 | 0.68 | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568 | 0.054 | 0.000 |
| 2015 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.56E+01 | 9.74E-04 | 2.87E-03 | 7.69E-03 | 1.29E+00 | 1.46E-05 | 2.56E-04 | 0.00E+00 | 8.79E-05 | 0.57 | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568 | 0.039 | 0.000 |
| 2015 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.29E+01 | 3.99E-03 | 1.19E-02 | 4.47E-02 | 4.78E+00 | 4.69E-05 | 1.29E-03 | 0.00E+00 | 3.60E-04 | 0.59 | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568 | 0.043 | 0.000 |
| 2015 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 1.20E-05 | 5.39E-05 | 1.03E-04 | 3.05E-02 | 3.00E-07 | 3.37E-06 | 0.00E+00 | 1.08E-06 | 0.43 | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568 | 0.020 | 0.000 |
| 2015 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 1.12E-04 | 3.49E-04 | 1.12E-03 | 1.57E-01 | 1.77E-06 | 3.62E-05 | 0.00E+00 | 1.01E-05 | 0.51 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568 | 0.037 | 0.000 |
| 2015 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 5.74E-05 | 2.37E-04 | 6.67E-04 | 1.14E-01 | 1.12E-06 | 2.08E-05 | 0.00E+00 | 5.18E-06 | 0.74 | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568 | 0.026 | 0.000 |
| 2015 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 3.85E-04 | 1.23E-03 | 3.45E-03 | 5.54E-01 | 5.44E-06 | 1.20E-04 | 0.00E+00 | 3.47E-05 | 0.74 | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568 | 0.036 | 0.000 |
| 2015 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 9.17E-06 | 2.85E-05 | 9.14E-05 | 1.29E-02 | 1.45E-07 | 2.96E-06 | 0.00E+00 | 8.28E-07 | 0.51 | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568 | 0.037 | 0.000 |
| 2016 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 6.97E+01 | 3.68E-03 | 1.18E-02 | 2.76E-02 | 5.52E+00 | 6.22E-05 | 9.18E-04 | 0.00E+00 | 3.32E-04 | 0.57 | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568 | 0.034 | 0.000 |
| 2016 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 5.03E+01 | 3.76E-03 | 1.22E-02 | 2.58E-02 | 5.87E+00 | 5.76E-05 | 9.22E-04 | 0.00E+00 | 3.39E-04 | 0.57 | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568 | 0.033 | 0.000 |
| 2016 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.11E+01 | 1.95E-03 | 6.12E-03 | 1.64E-02 | 2.68E+00 | 3.01E-05 | 5.60E-04 | 0.00E+00 | 1.76E-04 | 0.61 | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568 | 0.037 | 0.000 |
| 2016 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.28E+01 | 6.95E-04 | 4.62E-03 | 5.01E-03 | 7.97E-01 | 8.96E-06 | 2.72E-04 | 0.00E+00 | 6.27E-05 | 0.60 | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568 | 0.045 | 0.000 |
| 2016 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.78E+01 | 2.22E-03 | 7.76E-03 | 1.76E-02 | 3.29E+00 | 3.23E-05 | 6.26E-04 | 0.00E+00 | 2.00E-04 | 0.54 | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568 | 0.035 | 0.000 |
| 2016 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.59E+02 | 9.50E-03 | 6.21E-02 | 6.36E-02 | 9.28E+00 | 1.09E-04 | 4.60E-03 | 0.00E+00 | 8.57E-04 | 0.55 | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568 | 0.052 | 0.000 |
| 2016 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.74E+01 | 2.98E-03 | 1.08E-02 | 2.39E-02 | 3.54E+00 | 3.48E-05 | 9.14E-04 | 0.00E+00 | 2.69E-04 | 0.64 | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 550 | 0.042 | 0.000 |
| 2016 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.32E+01 | 1.15E-03 | 8.20E-03 | 8.22E-03 | 1.24E+00 | 1.46E-05 | 5.66E-04 | 0.00E+00 | 1.03E-04 | 0.68 | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568 | 0.047 | 0.000 |
| 2016 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.58E+01 | 9.31E-04 | 2.88E-03 | 6.89E-03 | 1.31E+00 | 1.48E-05 | 2.30E-04 | 0.00E+00 | 8.40E-05 | 0.57 | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568 | 0.036 | 0.000 |
| 2016 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.29E+01 | 3.79E-03 | 1.13E-02 | 4.20E-02 | 4.78E+00 | 4.69E-05 | 1.18E-03 | 0.00E+00 | 3.42E-04 | 0.59 | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568 | 0.041 | 0.000 |
| 2016 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 1.13E-05 | 5.39E-05 | 8.73E-05 | 3.05E-02 | 3.00E-07 | 2.84E-06 | 0.00E+00 | 1.02E-06 | 0.43 | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568 | 0.019 | 0.000 |
| 2016 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 1.06E-04 | 3.40E-04 | 1.00E-03 | 1.57E-01 | 1.77E-06 | 3.26E-05 | 0.00E+00 | 9.56E-06 | 0.51 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568 | 0.035 | 0.000 |
| 2016 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 5.35E-05 | 2.27E-04 | 5.98E-04 | 1.14E-01 | 1.12E-06 | 1.88E-05 | 0.00E+00 | 4.82E-06 | 0.74 | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568 | 0.024 | 0.000 |
| 2016 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 3.67E-04 | 1.18E-03 | 3.09E-03 | 5.54E-01 | 5.44E-06 | 1.09E-04 | 0.00E+00 | 3.31E-05 | 0.74 | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568 | 0.034 | 0.000 |
| 2016 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 8.67E-06 | 2.78E-05 | 8.22E-05 | 1.29E-02 | 1.45E-07 | 2.67E-06 | 0.00E+00 | 7.82E-07 | 0.51 | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568 | 0.035 | 0.000 |
| 2017 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 7.07E+01 | 3.51E-03 | 1.18E-02 | 2.44E-02 | 5.60E+00 | 6.30E-05 | 8.17E-04 | 0.00E+00 | 3.16E-04 | 0.57 | 0.356 | 1.200 | 2.477 | 0.006 | 0.083 | 0.074 | 568 | 0.032 | 0.000 |
| 2017 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 5.10E+01 | 3.60E-03 | 1.21E-02 | 2.30E-02 | 5.95E+00 | 5.84E-05 | 8.23E-04 | 0.00E+00 | 3.25E-04 | 0.57 | 0.344 | 1.157 | 2.193 | 0.006 | 0.079 | 0.070 | 568 | 0.031 | 0.000 |
| 2017 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.16E+01 | 1.87E-03 | 6.06E-03 | 1.49E-02 | 2.71E+00 | 3.05E-05 | 5.09E-04 | 0.00E+00 | 1.68E-04 | 0.61 | 0.391 | 1.270 | 3.127 | 0.006 | 0.107 | 0.095 | 568 | 0.035 | 0.000 |
| 2017 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.30E+01 | 6.44E-04 | 4.68E-03 | 4.47E-03 | 8.09E-01 | 9.10E-06 | 2.41E-04 | 0.00E+00 | 5.81E-05 | 0.60 | 0.453 | 3.289 | 3.142 | 0.006 | 0.169 | 0.151 | 568 | 0.041 | 0.000 |
| 2017 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.82E+01 | 2.14E-03 | 7.61E-03 | 1.60E-02 | 3.34E+00 | 3.28E-05 | 5.72E-04 | 0.00E+00 | 1.93E-04 | 0.54 | 0.364 | 1.296 | 2.722 | 0.006 | 0.097 | 0.087 | 568 | 0.033 | 0.000 |
| 2017 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.64E+02 | 8.75E-03 | 6.26E-02 | 5.87E-02 | 9.41E+00 | 1.10E-04 | 3.98E-03 | 0.00E+00 | 7.89E-04 | 0.55 | 0.528 | 3.783 | 3.547 | 0.007 | 0.241 | 0.214 | 568 | 0.048 | 0.000 |
| 2017 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.77E+01 | 2.87E-03 | 1.04E-02 | 2.22E-02 | 3.59E+00 | 3.52E-05 | 8.45E-04 | 0.00E+00 | 2.59E-04 | 0.64 | 0.439 | 1.591 | 3.405 | 0.005 | 0.129 | 0.115 | 550 | 0.040 | 0.000 |
| 2017 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.38E+01 | 1.06E-03 | 8.33E-03 | 7.64E-03 | 1.27E+00 | 1.49E-05 | 4.91E-04 | 0.00E+00 | 9.59E-05 | 0.68 | 0.476 | 3.732 | 3.422 | 0.007 | 0.220 | 0.196 | 568 | 0.043 | 0.000 |
| 2017 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.60E+01 | 8.87E-04 | 2.88E-03 | 6.13E-03 | 1.33E+00 | 1.50E-05 | 2.05E-04 | 0.00E+00 | 8.00E-05 | 0.57 | 0.379 | 1.230 | 2.617 | 0.006 | 0.088 | 0.078 | 568 | 0.034 | 0.000 |
| 2017 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.29E+01 | 3.62E-03 | 1.08E-02 | 3.96E-02 | 4.78E+00 | 4.69E-05 | 1.08E-03 | 0.00E+00 | 3.27E-04 | 0.59 | 0.431 | 1.289 | 4.705 | 0.006 | 0.129 | 0.115 | 568 | 0.039 | 0.000 |
| 2017 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 1.06E-05 | 5.39E-05 | 7.29E-05 | 3.05E-02 | 3.00E-07 | 2.31E-06 | 0.00E+00 | 9.57E-07 | 0.43 | 0.197 | 1.003 | 1.357 | 0.006 | 0.043 | 0.038 | 568 | 0.018 | 0.000 |
| 2017 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 1.00E-04 | 3.32E-04 | 8.96E-04 | 1.57E-01 | 1.77E-06 | 2.93E-05 | 0.00E+00 | 9.03E-06 | 0.51 | 0.362 | 1.201 | 3.237 | 0.006 | 0.106 | 0.094 | 568 | 0.033 | 0.000 |
| 2017 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 5.01E-05 | 2.19E-04 | 5.36E-04 | 1.14E-01 | 1.12E-06 | 1.70E-05 | 0.00E+00 | 4.52E-06 | 0.74 | 0.250 | 1.092 | 2.676 | 0.006 | 0.085 | 0.076 | 568 | 0.023 | 0.000 |
| 2017 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 3.50E-04 | 1.14E-03 | 2.77E-03 | 5.54E-01 | 5.44E-06 | 9.85E-05 | 0.00E+00 | 3.16E-05 | 0.74 | 0.359 | 1.171 | 2.842 | 0.006 | 0.101 | 0.090 | 568 | 0.032 | 0.000 |
| 2017 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 8.20E-06 | 2.72E-05 | 7.33E-05 | 1.29E-02 | 1.45E-07 | 2.40E-06 | 0.00E+00 | 7.40E-07 | 0.51 | 0.362 | 1.201 | 3.237 | 0.006 | 0.106 | 0.094 | 568 | 0.033 | 0.000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 7.18E+01 | 3.34E-03 | 1.19E-02 | 2.15E-02 | 5.69E+00 | 6.40E-05 | 7.23E-04 | 0.00E+00 | 3.01E-04 | 0.57 | 0.334 | 1.189 | 2.146 | 0.006 | 0.072 | 0.064 | 568 | 0.030 | 0.000 |
| 2018 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 5.18E+01 | 3.45E-03 | 1.21E-02 | 2.04E-02 | 6.04E+00 | 5.93E-05 | 7.34E-04 | 0.00E+00 | 3.12E-04 | 0.57 | 0.325 | 1.139 | 1.916 | 0.006 | 0.069 | 0.061 | 568 | 0.029 | 0.000 |
| 2018 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.20E+01 | 1.79E-03 | 6.04E-03 | 1.36E-02 | 2.75E+00 | 3.10E-05 | 4.62E-04 | 0.00E+00 | 1.61E-04 | 0.61 | 0.369 | 1.247 | 2.804 | 0.006 | 0.095 | 0.085 | 568 | 0.033 | 0.000 |
| 2018 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.32E+01 | 5.99E-04 | 4.75E-03 | 3.98E-03 | 8.21E-01 | 9.24E-06 | 2.12E-04 | 0.00E+00 | 5.40E-05 | 0.60 | 0.414 | 3.288 | 2.759 | 0.006 | 0.146 | 0.130 | 568 | 0.037 | 0.000 |
| 2018 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.86E+01 | 2.06E-03 | 7.50E-03 | 1.45E-02 | 3.39E+00 | 3.32E-05 | 5.21E-04 | 0.00E+00 | 1.86E-04 | 0.54 | 0.346 | 1.259 | 2.438 | 0.006 | 0.087 | 0.078 | 568 | 0.031 | 0.000 |
| 2018 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.69E+02 | 8.06E-03 | 6.32E-02 | 5.43E-02 | 9.54E+00 | 1.12E-04 | 3.41E-03 | 0.00E+00 | 7.27E-04 | 0.55 | 0.480 | 3.765 | 3.233 | 0.007 | 0.203 | 0.181 | 568 | 0.043 | 0.000 |
| 2018 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.81E+01 | 2.75E-03 | 1.01E-02 | 2.06E-02 | 3.64E+00 | 3.57E-05 | 7.78E-04 | 0.00E+00 | 2.48E-04 | 0.64 | 0.416 | 1.522 | 3.117 | 0.005 | 0.118 | 0.105 | 550 | 0.038 | 0.000 |
| 2018 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.45E+01 | 1.00E-03 | 8.47E-03 | 7.12E-03 | 1.29E+00 | 1.52E-05 | 4.29E-04 | 0.00E+00 | 9.06E-05 | 0.68 | 0.442 | 3.727 | 3.133 | 0.007 | 0.189 | 0.168 | 568 | 0.040 | 0.000 |
| 2018 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.62E+01 | 8.44E-04 | 2.89E-03 | 5.41E-03 | 1.35E+00 | 1.52E-05 | 1.83E-04 | 0.00E+00 | 7.61E-05 | 0.57 | 0.355 | 1.218 | 2.277 | 0.006 | 0.077 | 0.068 | 568 | 0.032 | 0.000 |
| 2018 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.29E+01 | 3.47E-03 | 1.05E-02 | 3.73E-02 | 4.78E+00 | 4.69E-05 | 9.95E-04 | 0.00E+00 | 3.13E-04 | 0.59 | 0.413 | 1.252 | 4.432 | 0.006 | 0.118 | 0.105 | 568 | 0.037 | 0.000 |
| 2018 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 9.88E-06 | 5.39E-05 | 5.97E-05 | 3.05E-02 | 3.00E-07 | 1.81E-06 | 0.00E+00 | 8.92E-07 | 0.43 | 0.184 | 1.003 | 1.111 | 0.006 | 0.034 | 0.030 | 568 | 0.017 | 0.000 |
| 2018 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 9.46E-05 | 3.26E-04 | 7.93E-04 | 1.57E-01 | 1.77E-06 | 2.62E-05 | 0.00E+00 | 8.54E-06 | 0.51 | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568 | 0.031 | 0.000 |
| 2018 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 4.72E-05 | 2.13E-04 | 4.80E-04 | 1.14E-01 | 1.12E-06 | 1.54E-05 | 0.00E+00 | 4.26E-06 | 0.74 | 0.236 | 1.064 | 2.395 | 0.006 | 0.077 | 0.068 | 568 | 0.021 | 0.000 |
| 2018 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 3.34E-04 | 1.11E-03 | 2.48E-03 | 5.54E-01 | 5.44E-06 | 8.90E-05 | 0.00E+00 | 3.01E-05 | 0.74 | 0.342 | 1.142 | 2.542 | 0.006 | 0.091 | 0.081 | 568 | 0.031 | 0.000 |
| 2018 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 7.75E-06 | 2.67E-05 | 6.49E-05 | 1.29E-02 | 1.45E-07 | 2.14E-06 | 0.00E+00 | 6.99E-07 | 0.51 | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568 | 0.031 | 0.000 |
| 2019 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 7.28E+01 | 3.18E-03 | 1.20E-02 | 1.88E-02 | 5.77E+00 | 6.50E-05 | 6.39E-04 | 0.00E+00 | 2.87E-04 | 0.57 | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568 | 0.028 | 0.000 |
| 2019 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 5.25E+01 | 3.31E-03 | 1.21E-02 | 1.81E-02 | 6.13E+00 | 6.02E-05 | 6.53E-04 | 0.00E+00 | 2.99E-04 | 0.57 | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568 | 0.028 | 0.000 |
| 2019 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.24E+01 | 1.71E-03 | 6.03E-03 | 1.23E-02 | 2.79E+00 | 3.14E-05 | 4.19E-04 | 0.00E+00 | 1.55E-04 | 0.61 | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568 | 0.032 | 0.000 |
| 2019 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.33E+01 | 5.62E-04 | 4.82E-03 | 3.56E-03 | 8.32E-01 | 9.37E-06 | 1.87E-04 | 0.00E+00 | 5.08E-05 | 0.60 | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568 | 0.035 | 0.000 |
| 2019 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.90E+01 | 1.99E-03 | 7.41E-03 | 1.31E-02 | 3.43E+00 | 3.37E-05 | 4.73E-04 | 0.00E+00 | 1.79E-04 | 0.54 | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568 | 0.030 | 0.000 |
| 2019 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.75E+02 | 7.45E-03 | 6.39E-02 | 5.03E-02 | 9.68E+00 | 1.14E-04 | 2.89E-03 | 0.00E+00 | 6.72E-04 | 0.55 | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568 | 0.039 | 0.000 |
| 2019 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.85E+01 | 2.64E-03 | 9.80E-03 | 1.91E-02 | 3.68E+00 | 3.62E-05 | 7.15E-04 | 0.00E+00 | 2.38E-04 | 0.64 | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 550 | 0.036 | 0.000 |
| 2019 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.51E+01 | 9.55E-04 | 8.62E-03 | 6.65E-03 | 1.32E+00 | 1.54E-05 | 3.74E-04 | 0.00E+00 | 8.62E-05 | 0.68 | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568 | 0.037 | 0.000 |
| 2019 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.65E+01 | 8.06E-04 | 2.91E-03 | 4.77E-03 | 1.37E+00 | 1.54E-05 | 1.62E-04 | 0.00E+00 | 7.27E-05 | 0.57 | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568 | 0.030 | 0.000 |
| 2019 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.29E+01 | 3.32E-03 | 1.03E-02 | 3.51E-02 | 4.78E+00 | 4.69E-05 | 9.09E-04 | 0.00E+00 | 3.00E-04 | 0.59 | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568 | 0.036 | 0.000 |
| 2019 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 9.16E-06 | 5.39E-05 | 4.77E-05 | 3.05E-02 | 3.00E-07 | 1.34E-06 | 0.00E+00 | 8.26E-07 | 0.43 | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568 | 0.015 | 0.000 |
| 2019 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 8.95E-05 | 3.21E-04 | 7.00E-04 | 1.57E-01 | 1.77E-06 | 2.34E-05 | 0.00E+00 | 8.08E-06 | 0.51 | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568 | 0.029 | 0.000 |
| 2019 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 4.46E-05 | 2.09E-04 | 4.28E-04 | 1.14E-01 | 1.12E-06 | 1.38E-05 | 0.00E+00 | 4.02E-06 | 0.74 | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568 | 0.020 | 0.000 |
| 2019 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 3.18E-04 | 1.09E-03 | 2.21E-03 | 5.54E-01 | 5.44E-06 | 7.99E-05 | 0.00E+00 | 2.87E-05 | 0.74 | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568 | 0.029 | 0.000 |
| 2019 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 7.33E-06 | 2.63E-05 | 5.73E-05 | 1.29E-02 | 1.45E-07 | 1.91E-06 | 0.00E+00 | 6.61E-07 | 0.51 | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568 | 0.029 | 0.000 |
| 2020 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 7.38E+01 | 3.04E-03 | 1.21E-02 | 1.65E-02 | 5.85E+00 | 6.58E-05 | 5.65E-04 | 0.00E+00 | 2.75E-04 | 0.57 | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568 | 0.027 | 0.000 |
| 2020 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 5.32E+01 | 3.18E-03 | 1.22E-02 | 1.60E-02 | 6.22E+00 | 6.10E-05 | 5.80E-04 | 0.00E+00 | 2.87E-04 | 0.57 | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568 | 0.026 | 0.000 |
| 2020 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.29E+01 | 1.64E-03 | 6.04E-03 | 1.11E-02 | 2.82E+00 | 3.18E-05 | 3.79E-04 | 0.00E+00 | 1.48E-04 | 0.61 | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568 | 0.030 | 0.000 |
| 2020 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.35E+01 | 5.32E-04 | 4.88E-03 | 3.18E-03 | 8.44E-01 | 9.50E-06 | 1.66E-04 | 0.00E+00 | 4.80E-05 | 0.60 | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568 | 0.032 | 0.000 |
| 2020 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.94E+01 | 1.91E-03 | 7.36E-03 | 1.19E-02 | 3.48E+00 | 3.41E-05 | 4.29E-04 | 0.00E+00 | 1.73E-04 | 0.54 | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568 | 0.028 | 0.000 |
| 2020 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.80E+02 | 6.95E-03 | 6.46E-02 | 4.68E-02 | 9.82E+00 | 1.15E-04 | 2.45E-03 | 0.00E+00 | 6.27E-04 | 0.55 | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568 | 0.036 | 0.000 |
| 2020 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.88E+01 | 2.54E-03 | 9.58E-03 | 1.76E-02 | 3.73E+00 | 3.66E-05 | 6.57E-04 | 0.00E+00 | 2.29E-04 | 0.64 | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 550 | 0.034 | 0.000 |
| 2020 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.57E+01 | 9.07E-04 | 8.77E-03 | 6.18E-03 | 1.34E+00 | 1.57E-05 | 3.18E-04 | 0.00E+00 | 8.19E-05 | 0.68 | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568 | 0.035 | 0.000 |
| 2020 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.67E+01 | 7.72E-04 | 2.93E-03 | 4.20E-03 | 1.39E+00 | 1.56E-05 | 1.44E-04 | 0.00E+00 | 6.97E-05 | 0.57 | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568 | 0.028 | 0.000 |
| 2020 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.29E+01 | 3.17E-03 | 1.01E-02 | 3.30E-02 | 4.78E+00 | 4.69E-05 | 8.25E-04 | 0.00E+00 | 2.86E-04 | 0.59 | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568 | 0.034 | 0.000 |
| 2020 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 8.64E-06 | 5.39E-05 | 3.92E-05 | 3.05E-02 | 3.00E-07 | 1.14E-06 | 0.00E+00 | 7.79E-07 | 0.43 | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568 | 0.015 | 0.000 |
| 2020 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 8.48E-05 | 3.17E-04 | 6.17E-04 | 1.57E-01 | 1.77E-06 | 2.08E-05 | 0.00E+00 | 7.65E-06 | 0.51 | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568 | 0.028 | 0.000 |
| 2020 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 4.21E-05 | 2.07E-04 | 3.78E-04 | 1.14E-01 | 1.12E-06 | 1.24E-05 | 0.00E+00 | 3.80E-06 | 0.74 | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568 | 0.019 | 0.000 |
| 2020 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 3.03E-04 | 1.08E-03 | 1.95E-03 | 5.54E-01 | 5.44E-06 | 7.12E-05 | 0.00E+00 | 2.73E-05 | 0.74 | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568 | 0.028 | 0.000 |
| 2020 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 6.94E-06 | 2.60E-05 | 5.05E-05 | 1.29E-02 | 1.45E-07 | 1.70E-06 | 0.00E+00 | 6.27E-07 | 0.51 | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568 | 0.028 | 0.000 |
| 2021 | Annual | 2270002036 | Hydraulic Excavator - Medium | D | 250 | 222 | Construction and Mining Equipment | U | N | NHH | NP | 7.48E+01 | 2.92E-03 | 1.22E-02 | 1.45E-02 | 5.93E+00 | 6.67E-05 | 4.98E-04 | 0.00E+00 | 2.63E-04 | 0.57 | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568 | 0.025 | 0.000 |
| 2021 | Annual | 2270002036 | Hydraulic Excavator - Large | D | 500 | 327 | Construction and Mining Equipment | U | N | NHH | NP | 5.40E+01 | 3.06E-03 | 1.23E-02 | 1.41E-02 | 6.30E+00 | 6.18E-05 | 5.14E-04 | 0.00E+00 | 2.76E-04 | 0.57 | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568 | 0.025 | 0.000 |
| 2021 | Annual | 2270002048 | Motor Grader | D | 250 | 225 | Construction and Mining Equipment | U | N | NHH | NP | 3.33E+01 | 1.58E-03 | 6.06E-03 | 1.00E-02 | 2.86E+00 | 3.22E-05 | 3.43E-04 | 0.00E+00 | 1.42E-04 | 0.61 | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568 | 0.028 | 0.000 |
| 2021 | Annual | 2270002057 | Forklift | D | 175 | 166 | Construction and Mining Equipment | U | P | NHH | NP | 1.37E+01 | 5.05E-04 | 4.95E-03 | 2.83E-03 | 8.56E-01 | 9.63E-06 | 1.46E-04 | 0.00E+00 | 4.55E-05 | 0.60 | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568 | 0.030 | 0.000 |
| 2021 | Annual | 2270002060 | Loader | D | 500 | 350 | Construction and Mining Equipment | U | N | NHH | NP | 2.98E+01 | 1.85E-03 | 7.31E-03 | 1.07E-02 | 3.53E+00 | 3.46E-05 | 3.88E-04 | 0.00E+00 | 1.66E-04 | 0.54 | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568 | 0.027 | 0.000 |
| 2021 | Annual | 2270002066 | Backhoe/Loader | D | 120 | 75 | Construction and Mining Equipment | U | P | NHH | NP | 3.85E+02 | 6.54E-03 | 6.53E-02 | 4.37E-02 | 9.96E+00 | 1.17E-04 | 2.07E-03 | 0.00E+00 | 5.90E-04 | 0.55 | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568 | 0.034 | 0.000 |
| 2021 | Annual | 2270002069 | Crawler Crane | D | 500 | 334 | Construction and Mining Equipment | U | N | NHH | NP | 2.92E+01 | 2.44E-03 | 9.39E-03 | 1.63E-02 | 3.78E+00 | 3.71E-05 | 6.04E-04 | 0.00E+00 | 2.20E-04 | 0.64 | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 550 | 0.032 | 0.000 |
| 2021 | Annual | 2270003030 | Street Sweeper | D | 120 | 88 | Industrial Equipment | U | N | NHH | NP | 3.74E+01 | 8.76E-04 | 9.13E-03 | 5.93E-03 | 1.40E+00 | 1.65E-05 | 2.71E-04 | 0.00E+00 | 7.90E-05 | 0.68 | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568 | 0.032 | 0.000 |
| 2021 | Annual | 2270002051 | Water Truck | D | 250 | 233 | Construction and Mining Equipment | U | N | NHH | NP | 1.69E+01 | 7.42E-04 | 2.95E-03 | 3.70E-03 | 1.41E+00 | 1.58E-05 | 1.28E-04 | 0.00E+00 | 6.70E-05 | 0.57 | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568 | 0.027 | 0.000 |
| 2021 | Annual | 2270003050 | Pipe Barge | D | 9999 | 1002 | Industrial Equipment | U | N | NHH | NP | 1.31E+01 | 3.02E-03 | 1.01E-02 | 3.13E-02 | 4.87E+00 | 4.78E-05 | 7.48E-04 | 0.00E+00 | 2.73E-04 | 0.59 | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568 | 0.032 | 0.000 |
| 2021 | Annual | 2270012010 | Crane Barge | D | 750 | 668 | Dredging | U | N | NHH | P | 1.70E-01 | 8.14E-06 | 5.39E-05 | 3.19E-05 | 3.05E-02 | 3.00E-07 | 9.84E-07 | 0.00E+00 | 7.35E-07 | 0.43 | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568 | 0.014 | 0.000 |
| 2021 | Annual | 2270012025 | Hoist | D | 250 | 213 | Dredging | U | N | NHH | P | 2.31E+00 | 8.04E-05 | 3.14E-04 | 5.40E-04 | 1.57E-01 | 1.77E-06 | 1.83E-05 | 0.00E+00 | 7.25E-06 | 0.51 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568 | 0.026 | 0.000 |
| 2021 | Annual | 2270012030 | Pump (Dredging) | D | 500 | 386 | Dredging | U | N | NHH | P | 6.37E-01 | 3.98E-05 | 2.04E-04 | 3.33E-04 | 1.14E-01 | 1.12E-06 | 1.10E-05 | 0.00E+00 | 3.59E-06 | 0.74 | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568 | 0.018 | 0.000 |
| 2021 | Annual | 2270012035 | Generator (Dredging) | D | 500 | 401 | Dredging | U | N | NHH | P | 2.98E+00 | 2.87E-04 | 1.07E-03 | 1.71E-03 | 5.54E-01 | 5.44E-06 | 6.28E-05 | 0.00E+00 | 2.59E-05 | 0.74 | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568 | 0.027 | 0.000 |
| 2021 | Annual | 2270012040 | Dump Barge | D | 250 | 218 | Dredging | U | N | NHH | P | 1.85E-01 | 6.58E-06 | 2.57E-05 | 4.42E-05 | 1.29E-02 | 1.45E-07 | 1.50E-06 | 0.00E+00 | 5.94E-07 | 0.51 | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568 | 0.026 | 0.000 |

# Electricity Usage

**Emission Factors - Grams per Kilo Watt Hour (g/kw-hr)**

| $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|
| 308.9009 | 0.012832 | 0.002826 |

Criteria Pollutant Emission Factors from Table A9-11-B, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG Emission Factors from Table C2, California Climate Action Registry General Reporting Protocol Version 3.1. January 2009.

**Emission Factors - Pounds per Mega Watt Hour (lbs/MWh)**

| ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|
| 0.01 | 0.2 | 1.15 | 0.12 | 0.04 | 0.0356 | 681.01 | 0.02829 | 0.00623 |

Criteria Pollutant Emission Factors from Table A9-11-B, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG Emission Factors from Table C2, California Climate Action Registry General Reporting Protocol Version 3.1. January 2009.

## LOCOMOTIVE EMISSION FACTORS

EPA Tier 1-4 Nonroad Diesel Engine Emission Standards, g/bhp-hr

| Engine Power | Tier | Year | CO | HC | NMHC + NOx | NOx | PM |
|---|---|---|---|---|---|---|---|
| 130 ≤ kW < 225 (175 ≤ hp < 300) | Tier 1 | 1996 | 8.5 | 1 | - | 6.9 | 0.4 |
| | Tier 2 | 2003 | 2.6 | - | 4.9 | - | 0.15 |
| | Tier 3 | 2006 | 2.6 | - | 3 | - | 0.15 |
| | Tier 4 | 2011-2014[d] | 2.6 | 0.14 | - | 0.3 | 0.015 |

EPA Tier 1-4 Nonroad Diesel Engine Emission Standards, g/bhp-hr

| Tier | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.05 | 8.50 | 6.90 | 0.01 | 0.39 | 0.39 | 114.28 | 0.01 | 0.00 |
| 2 | 0.26 | 2.60 | 4.66 | 0.01 | 0.15 | 0.15 | 34.96 | 0.00 | 0.00 |
| 3 | 0.16 | 2.60 | 2.85 | 0.01 | 0.15 | 0.15 | 34.96 | 0.00 | 0.00 |
| 4 | 0.15 | 2.60 | 0.30 | 0.01 | 0.01 | 0.01 | 34.96 | 0.00 | 0.00 |

| | |
|---|---|
| NMHC/NOx Ratios | |
| NMHC/NMHC+NOx | 0.05 |
| NOx/NMHC+NOx | 0.95 |
| | |
| PM Ratios | |
| PM10/PM | 0.98 |
| PM2.5/PM | 0.97 |
| | |
| Hydrocarbon Ratios | |
| NMHC/HC | 0.98 |
| VOC/HC | 1.05 |

Fuel Based Factors

| Conversion Factor (gal/hp-hr) |
|---|
| 0.05 |

| SO2 Fuel Content (g/gal) | SO2 EF (g/hp-hr) |
|---|---|
| 0.09 | 0.01 |

| C Fuel Content (g/gal) | CO2 Fuel Content (g/gal) | CO2 EF (g/hp-hr) |
|---|---|---|
| 0.18 | 2,079.86 | 114.28 |
| 0.05 | 636.19 | 34.96 |
| 0.05 | 636.19 | 34.96 |
| 0.05 | 636.19 | 34.96 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | LDA-CAT | | | | |
| Vehicles | 6,075,410 | | | | |
| VMT/1000 | 205,698 | | | | |
| Trips | 38,142,600 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.93 | 15,860 | 7,193,977 | 0.03497 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 11.31 | 22,620 | 10,260,262 | | 0.26900 |
| | ------- | | | | |
| Total Ex | 19.24 | 38,480 | 17,454,239 | | |
| | | | | | |
| Diurnal | 3.67 | 7,340 | 3,329,369 | 0.01619 | |
| Hot Soak | 6.44 | 12,880 | 5,842,271 | 0.02840 | |
| Running | 14.84 | 29,680 | 13,462,625 | 0.06545 | |
| Resting | 2.71 | 5,420 | 2,458,471 | 0.01195 | |
| | ------- | | | | |
| Total | 46.91 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 338.41 | 676,820 | 307,000,476 | 1.49248 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 143.45 | 286,900 | 130,135,688 | | 3.41182 |
| | ------- | | | | |
| Total Ex | 481.86 | 963,720 | 437,136,164 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 28.69 | 57,380 | 26,027,138 | 0.12653 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 9.57 | 19,140 | 8,681,760 | | 0.22761 |
| | ------- | | | | |
| Total Ex | 38.26 | 76,520 | 34,708,898 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 89.11 | 178,220 | 80,839,255 | 392.99971 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.01 | 6,020 | 2,730,627 | | 71.58995 |
| | ------- | | | | |
| Total Ex | 92.12 | 184,240 | 83,569,882 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.81 | 5,620 | 2,549,190 | 0.01239 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.26 | 520 | 235,868 | | 0.00618 |
| | ------- | | | | |
| Total Ex | 3.07 | 6,140 | 2,785,058 | | |
| | | | | | |
| TireWear | 1.81 | 3,620 | 1,642,005 | 0.00798 | |
| BrakeWr | 2.84 | 5,680 | 2,576,405 | 0.01253 | |
| | ------- | | | | |
| Total | 7.73 | 15,460 | 7,012,540 | | |
| Lead | 0 | | | | |
| SOx | 0.89 | 1,780 | 807,395 | 0.00393 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9515.69 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,157,280 | | | | |
| VMT/1000 | 207,520 | | | | |
| Trips | 38,595,500 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.27 | 14,540 | 6,595,235 | 0.03178 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 10.3 | 20,600 | 9,344,006 | | 0.24210 |
| | ------- | | | | |
| Total Ex | 17.57 | 35,140 | 15,939,240 | | |
| | | | | | |
| Diurnal | 3.53 | 7,060 | 3,202,363 | 0.01543 | |
| Hot Soak | 6.4 | 12,800 | 5,805,984 | 0.02798 | |
| Running | 14.38 | 28,760 | 13,045,320 | 0.06286 | |
| Resting | 2.68 | 5,360 | 2,431,256 | 0.01172 | |
| | ------- | | | | |
| Total | 44.56 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 316.52 | 633,040 | 287,142,196 | 1.38368 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 133.15 | 266,300 | 120,791,683 | | 3.12968 |
| | ------- | | | | |
| Total Ex | 449.68 | 899,360 | 407,942,951 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 26.45 | 52,900 | 23,995,043 | 0.11563 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 8.76 | 17,520 | 7,946,941 | | 0.20590 |
| | ------- | | | | |
| Total Ex | 35.21 | 70,420 | 31,941,984 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 89.72 | 179,440 | 81,392,638 | 392.21587 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.04 | 6,080 | 2,757,842 | | 71.45502 |
| | ------- | | | | |
| Total Ex | 92.76 | 185,520 | 84,150,481 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.86 | 5,720 | 2,594,549 | 0.01250 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.27 | 540 | 244,940 | | 0.00635 |
| | ------- | | | | |
| Total Ex | 3.13 | 6,260 | 2,839,489 | | |
| | | | | | |
| TireWear | 1.83 | 3,660 | 1,660,149 | 0.00800 | |
| BrakeWr | 2.87 | 5,740 | 2,603,621 | 0.01255 | |
| | ------- | | | | |
| Total | 7.83 | 15,660 | 7,103,259 | | |
| Lead | 0 | | | | |
| SOx | 0.9 | 1,800 | 816,467 | 0.00393 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9575.19 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2016 -- All model years in the range 1972 to 2016 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | LDA-CAT | | | | |
| Vehicles | 6,220,690 | | | | |
| VMT/1000 | 208,546 | | | | |
| Trips | 38,927,800 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.77 | 13,540 | 6,141,642 | 0.02945 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 9.38 | 18,760 | 8,509,395 | | 0.21859 |
| | ------- | | | | |
| Total Ex | 16.15 | 32,300 | 14,651,038 | | |
| | | | | | |
| Diurnal | 3.39 | 6,780 | 3,075,357 | 0.01482 | |
| Hot Soak | 6.33 | 12,660 | 5,742,481 | 0.02767 | |
| Running | 13.94 | 27,880 | 12,646,159 | 0.06094 | |
| Resting | 2.65 | 5,300 | 2,404,040 | 0.01158 | |
| | ------- | | | | |
| Total | 42.47 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 297.52 | 595,040 | 269,905,681 | 1.29423 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 123.39 | 246,780 | 111,937,557 | | 2.87552 |
| | ------- | | | | |
| Total Ex | 420.91 | 841,820 | 381,843,238 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 24.48 | 48,960 | 22,207,889 | 0.10649 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.99 | 15,980 | 7,248,408 | | 0.18620 |
| | ------- | | | | |
| Total Ex | 32.47 | 64,940 | 29,456,297 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 90.45 | 180,900 | 82,054,883 | 393.46179 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.06 | 6,120 | 2,775,986 | | 71.31115 |
| | ------- | | | | |
| Total Ex | 93.51 | 187,020 | 84,830,869 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.94 | 5,880 | 2,667,124 | 0.01279 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.28 | 560 | 254,012 | | 0.00653 |
| | ------- | | | | |
| Total Ex | 3.22 | 6,440 | 2,921,136 | | |
| | | | | | |
| TireWear | 1.84 | 3,680 | 1,669,220 | 0.00800 | |
| BrakeWr | 2.88 | 5,760 | 2,612,693 | 0.01253 | |
| | ------- | | | | |
| Total | 7.94 | 15,880 | 7,203,049 | | |
| Lead | 0 | | | | |
| SOx | 0.9 | 1,800 | 816,467 | 0.00392 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9647.24 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2017 -- All model years in the range 1973 to 2017 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,284,290 | | | | |
| VMT/1000 | 209,938 | | | | |
| Trips | 39,265,500 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.26 | 12,520 | 5,678,978 | 0.02705 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 8.55 | 17,100 | 7,756,432 | | 0.19754 |
| | ------- | | | | |
| Total Ex | 14.81 | 29,620 | 13,435,410 | | |
| | | | | | |
| Diurnal | 3.27 | 6,540 | 2,966,495 | 0.01429 | |
| Hot Soak | 6.25 | 12,500 | 5,669,906 | 0.02732 | |
| Running | 13.52 | 27,040 | 12,265,141 | 0.05910 | |
| Resting | 2.6 | 5,200 | 2,358,681 | 0.01137 | |
| | ------- | | | | |
| Total | 40.45 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 278.67 | 557,340 | 252,805,244 | 1.20419 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 114.19 | 228,380 | 103,591,455 | | 2.63823 |
| | ------- | | | | |
| Total Ex | 392.86 | 785,720 | 356,396,699 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 22.65 | 45,300 | 20,547,740 | 0.09788 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.26 | 14,520 | 6,586,163 | | 0.16773 |
| | ------- | | | | |
| Total Ex | 29.91 | 59,820 | 27,133,903 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 90.91 | 181,820 | 82,472,188 | 392.84069 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.08 | 6,160 | 2,794,130 | | 71.15992 |
| | ------- | | | | |
| Total Ex | 93.99 | 187,980 | 85,266,318 | | |
| PM10 Emissions | | | | | |
| Run Exh | 2.99 | 5,980 | 2,712,483 | 0.01292 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.28 | 560 | 254,012 | | 0.00647 |
| | ------- | | | | |
| Total Ex | 3.27 | 6,540 | 2,966,495 | | |
| | | | | | |
| TireWear | 1.85 | 3,700 | 1,678,292 | 0.00799 | |
| BrakeWr | 2.9 | 5,800 | 2,630,837 | 0.01253 | |
| | ------- | | | | |
| Total | 8.02 | 16,040 | 7,275,624 | | |
| Lead | 0 | | | | |
| SOx | 0.91 | 1,820 | 825,538 | 0.00393 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9691.48 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2018 -- All model years in the range 1974 to 2018 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,347,850 | | | | |
| VMT/1000 | 211,564 | | | | |
| Trips | 39,607,000 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.8 | 11,600 | 5,261,673 | 0.02487 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.8 | 15,600 | 7,076,043 | | 0.17866 |
| | ------- | | | | |
| Total Ex | 13.6 | 27,200 | 12,337,716 | | |
| | | | | | |
| Diurnal | 3.14 | 6,280 | 2,848,561 | 0.01373 | |
| Hot Soak | 6.13 | 12,260 | 5,561,044 | 0.02680 | |
| Running | 13.13 | 26,260 | 11,911,339 | 0.05740 | |
| Resting | 2.55 | 5,100 | 2,313,322 | 0.01115 | |
| | ------- | | | | |
| Total | 38.54 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 261.22 | 522,440 | 236,974,866 | 1.12011 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 105.54 | 211,080 | 95,744,305 | | 2.41736 |
| | ------- | | | | |
| Total Ex | 366.76 | 733,520 | 332,719,171 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 21 | 42,000 | 19,050,885 | 0.09005 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 6.59 | 13,180 | 5,978,349 | | 0.15094 |
| | ------- | | | | |
| Total Ex | 27.59 | 55,180 | 25,029,234 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 91.44 | 182,880 | 82,952,996 | 392.09410 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.1 | 6,200 | 2,812,274 | | 71.00446 |
| | ------- | | | | |
| Total Ex | 94.54 | 189,080 | 85,765,270 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.02 | 6,040 | 2,739,699 | 0.01295 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.29 | 580 | 263,084 | | 0.00664 |
| | ------- | | | | |
| Total Ex | 3.31 | 6,620 | 3,002,782 | | |
| | | | | | |
| TireWear | 1.87 | 3,740 | 1,696,436 | 0.00802 | |
| BrakeWr | 2.93 | 5,860 | 2,658,052 | 0.01256 | |
| | ------- | | | | |
| Total | 8.1 | 16,200 | 7,348,199 | | |
| Lead | 0 | | | | |
| SOx | 0.91 | 1,820 | 825,538 | 0.00390 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9742.85 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2019 -- All model years in the range 1975 to 2019 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,411,000 | | | | |
| VMT/1000 | 213,354 | | | | |
| Trips | 39,951,600 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.39 | 10,780 | 4,889,727 | 0.02292 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 7.11 | 14,220 | 6,450,085 | | 0.16145 |
| | ------- | | | | |
| Total Ex | 12.5 | 25,000 | 11,339,813 | | |
| | | | | | |
| Diurnal | 3.02 | 6,040 | 2,739,699 | 0.01320 | |
| Hot Soak | 6 | 12,000 | 5,443,110 | 0.02623 | |
| Running | 12.74 | 25,480 | 11,557,537 | 0.05569 | |
| Resting | 2.49 | 4,980 | 2,258,891 | 0.01089 | |
| | ------- | | | | |
| Total | 36.76 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 245.27 | 490,540 | 222,505,265 | 1.04289 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 97.5 | 195,000 | 88,450,538 | | 2.21394 |
| | ------- | | | | |
| Total Ex | 342.77 | 685,540 | 310,955,802 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 19.52 | 39,040 | 17,708,251 | 0.08300 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 5.97 | 11,940 | 5,415,894 | | 0.13556 |
| | ------- | | | | |
| Total Ex | 25.49 | 50,980 | 23,124,146 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 92.05 | 184,100 | 83,506,379 | 391.39824 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.12 | 6,240 | 2,830,417 | | 70.84615 |
| | ------- | | | | |
| Total Ex | 95.17 | 190,340 | 86,336,796 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.06 | 6,120 | 2,775,986 | 0.01301 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.29 | 580 | 263,084 | | 0.00659 |
| | ------- | | | | |
| Total Ex | 3.35 | 6,700 | 3,039,070 | | |
| | | | | | |
| TireWear | 1.88 | 3,760 | 1,705,508 | 0.00799 | |
| BrakeWr | 2.95 | 5,900 | 2,676,196 | 0.01254 | |
| | ------- | | | | |
| Total | 8.18 | 16,360 | 7,420,773 | | |
| Lead | 0 | | | | |
| SOx | 0.92 | 1,840 | 834,610 | 0.00391 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9803.49 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,473,030 | | | | |
| VMT/1000 | 215,241 | | | | |
| Trips | 40,296,400 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 4.99 | 9,980 | 4,526,853 | 0.02103 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 6.49 | 12,980 | 5,887,631 | | 0.14611 |
| | ------- | | | | |
| Total Ex | 11.48 | 22,960 | 10,414,484 | | |
| | | | | | |
| Diurnal | 2.89 | 5,780 | 2,621,765 | 0.01263 | |
| Hot Soak | 5.84 | 11,680 | 5,297,960 | 0.02553 | |
| Running | 12.34 | 24,680 | 11,194,663 | 0.05394 | |
| Resting | 2.42 | 4,840 | 2,195,388 | 0.01058 | |
| | ------- | | | | |
| Total | 34.97 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 230.3 | 460,600 | 208,924,706 | 0.97065 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 89.96 | 179,920 | 81,610,363 | | 2.02525 |
| | ------- | | | | |
| Total Ex | 320.26 | 640,520 | 290,535,068 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 18.15 | 36,300 | 16,465,408 | 0.07650 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 5.4 | 10,800 | 4,898,799 | | 0.12157 |
| | ------- | | | | |
| Total Ex | 23.55 | 47,100 | 21,364,207 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 92.72 | 185,440 | 84,114,193 | 390.79076 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.14 | 6,280 | 2,848,561 | | 70.69021 |
| | ------- | | | | |
| Total Ex | 95.86 | 191,720 | 86,962,754 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.09 | 6,180 | 2,803,202 | 0.01302 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.29 | 580 | 263,084 | | 0.00653 |
| | ------- | | | | |
| Total Ex | 3.38 | 6,760 | 3,066,285 | | |
| | | | | | |
| TireWear | 1.9 | 3,800 | 1,723,652 | 0.00801 | |
| BrakeWr | 2.98 | 5,960 | 2,703,411 | 0.01256 | |
| | ------- | | | | |
| Total | 8.26 | 16,520 | 7,493,348 | | |
| Lead | 0 | | | | |
| SOx | 0.93 | 1,860 | 843,682 | 0.00392 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9869.77 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2021 -- All model years in the range 1977 to 2021 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| LDA-CAT | | | | | |
| Vehicles | 6,506,540 | | | | |
| VMT/1000 | 215,640 | | | | |
| Trips | 40,460,100 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 4.68 | 9,360 | 4,245,626 | 0.01969 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 5.92 | 11,840 | 5,370,535 | | 0.13274 |
| | ------- | | | | |
| Total Ex | 10.6 | 21,200 | 9,616,161 | | |
| | | | | | |
| Diurnal | 2.77 | 5,540 | 2,512,902 | 0.01211 | |
| Hot Soak | 5.67 | 11,340 | 5,143,739 | 0.02479 | |
| Running | 11.93 | 23,860 | 10,822,717 | 0.05215 | |
| Resting | 2.34 | 4,680 | 2,122,813 | 0.01023 | |
| | ------- | | | | |
| Total | 33.32 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 217.96 | 435,920 | 197,730,043 | 0.91695 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 83.03 | 166,060 | 75,323,571 | | 1.86168 |
| | ------- | | | | |
| Total Ex | 300.99 | 601,980 | 273,053,613 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 16.94 | 33,880 | 15,367,714 | 0.07127 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 4.9 | 9,800 | 4,445,207 | | 0.10987 |
| | ------- | | | | |
| Total Ex | 21.84 | 43,680 | 19,812,920 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 93.25 | 186,500 | 84,595,001 | 392.29735 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 3.15 | 6,300 | 2,857,633 | | 70.62842 |
| | ------- | | | | |
| Total Ex | 96.4 | 192,800 | 87,452,634 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.15 | 6,300 | 2,857,633 | 0.01325 | |
| Idle Exh | 0 | - | - | | - |
| Start Ex | 0.3 | 600 | 272,156 | | 0.00673 |
| | ------- | | | | |
| Total Ex | 3.44 | 6,880 | 3,120,716 | | |
| | | | | | |
| TireWear | 1.9 | 3,800 | 1,723,652 | 0.00799 | |
| BrakeWr | 2.98 | 5,960 | 2,703,411 | 0.01254 | |
| | ------- | | | | |
| Total | 8.33 | 16,660 | 7,556,851 | | |
| Lead | 0 | | | | |
| SOx | 0.93 | 1,860 | 843,682 | 0.00391 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 9921.23 | | | | |
| Diesel | 0 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| | HHDT-DSL | | | | |
| Vehicles | 58,324 | | | | |
| VMT/1000 | 11,439 | | | | |
| Trips | 295,146 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 9.95 | 19,900 | 9,026,491 | 0.78910 | |
| Idle Exh | 1.12 | 2,240 | 1,016,047 | | 3.44252 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 11.07 | 22,140 | 10,042,538 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | ------- | | | | |
| Total | 11.07 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 40.32 | 80,640 | 36,577,699 | 3.19763 | |
| Idle Exh | 4.91 | 9,820 | 4,454,278 | | 15.09178 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 45.23 | 90,460 | 41,031,978 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 116.86 | 233,720 | 106,013,639 | 9.26774 | |
| Idle Exh | 12.61 | 25,220 | 11,439,603 | | 38.75913 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 129.47 | 258,940 | 117,453,242 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 23.23 | 46,460 | 21,073,908 | 1,842.28582 | |
| Idle Exh | 0.72 | 1,440 | 653,173 | | 2,213.05117 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 23.94 | 47,880 | 21,718,009 | | |
| PM10 Emissions | | | | | |
| Run Exh | 5.7 | 11,400 | 5,170,955 | 0.45205 | |
| Idle Exh | 0.12 | 240 | 108,862 | | 0.36884 |
| Start Ex | 0 | - | - | | - |
| | ------- | | | | |
| Total Ex | 5.82 | 11,640 | 5,279,817 | | |
| | | | | | |
| TireWear | 0.45 | 900 | 408,233 | 0.03569 | |
| BrakeWr | 0.36 | 720 | 326,587 | 0.02855 | |
| | ------- | | | | |
| Total | 6.63 | 13,260 | 6,014,637 | | |
| Lead | 0 | | | | |
| SOx | 0.23 | 460 | 208,653 | 0.01824 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2154.97 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 60,159 | | | | |
| VMT/1000 | 12,042 | | | | |
| Trips | 304,434 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 9.22 | 18,440 | 8,364,246 | 0.69459 | |
| Idle Exh | 1.1 | 2,200 | 997,904 | | 3.27790 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 10.32 | 20,640 | 9,362,149 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| | --- | | | | |
| Total | 10.32 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 38.14 | 76,280 | 34,600,036 | 2.87328 | |
| Idle Exh | 5 | 10,000 | 4,535,925 | | 14.89953 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 43.14 | 86,280 | 39,135,961 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 106.67 | 213,340 | 96,769,424 | 8.03599 | |
| Idle Exh | 13.14 | 26,280 | 11,920,411 | | 39.15598 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 119.81 | 239,620 | 108,689,835 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 24.45 | 48,900 | 22,180,673 | 1,841.94264 | |
| Idle Exh | 0.74 | 1,480 | 671,317 | | 2,205.13116 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 25.19 | 50,380 | 22,851,990 | | |
| PM10 Emissions | | | | | |
| Run Exh | 5.22 | 10,440 | 4,735,506 | 0.39325 | |
| Idle Exh | 0.11 | 220 | 99,790 | | 0.32779 |
| Start Ex | 0 | - | - | | - |
| | --- | | | | |
| Total Ex | 5.33 | 10,660 | 4,835,296 | | |
| | | | | | |
| TireWear | 0.48 | 960 | 435,449 | 0.03616 | |
| BrakeWr | 0.37 | 740 | 335,658 | 0.02787 | |
| | --- | | | | |
| Total | 6.18 | 12,360 | 5,606,403 | | |
| Lead | 0 | | | | |
| SOx | 0.24 | 480 | 217,724 | 0.01808 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2266.95 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2016 -- All model years in the range 1972 to 2016 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 61,237 | | | | |
| VMT/1000 | 12,456 | | | | |
| Trips | 309,889 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 8.51 | 17,020 | 7,720,144 | 0.61979 | |
| Idle Exh | 1.08 | 2,160 | 979,760 | | 3.16165 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 9.59 | 19,180 | 8,699,904 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 9.59 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 35.87 | 71,740 | 32,540,726 | 2.61245 | |
| Idle Exh | 5.03 | 10,060 | 4,563,141 | | 14.72508 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 40.9 | 81,800 | 37,103,867 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 96.67 | 193,340 | 87,697,574 | 7.04059 | |
| Idle Exh | 13.48 | 26,960 | 12,228,854 | | 39.46205 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 110.15 | 220,300 | 99,926,428 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 25.31 | 50,620 | 22,960,852 | 1,843.35680 | |
| Idle Exh | 0.75 | 1,500 | 680,389 | | 2,195.58858 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 26.06 | 52,120 | 23,641,241 | | |
| PM10 Emissions | | | | | |
| Run Exh | 4.75 | 9,500 | 4,309,129 | 0.34595 | |
| Idle Exh | 0.1 | 200 | 90,719 | | 0.29275 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 4.85 | 9,700 | 4,399,847 | | |
| | | | | | |
| TireWear | 0.49 | 980 | 444,521 | 0.03569 | |
| BrakeWr | 0.39 | 780 | 353,802 | 0.02840 | |
| ------- | | | | | |
| Total | 5.73 | 11,460 | 5,198,170 | | |
| Lead | 0 | | | | |
| SOx | 0.25 | 500 | 226,796 | 0.01821 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2345.42 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2017 -- All model years in the range 1973 to 2017 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 62,310 | | | | |
| VMT/1000 | 12,833 | | | | |
| Trips | 315,319 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.84 | 15,680 | 7,112,330 | 0.55422 | |
| Idle Exh | 1.07 | 2,140 | 970,688 | | 3.07843 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 8.9 | 17,800 | 8,073,947 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 8.9 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 33.77 | 67,540 | 30,635,637 | 2.38725 | |
| Idle Exh | 5.07 | 10,140 | 4,599,428 | | 14.58659 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 38.84 | 77,680 | 35,235,065 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 87.86 | 175,720 | 79,705,274 | 6.21096 | |
| Idle Exh | 13.82 | 27,640 | 12,537,297 | | 39.76068 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 101.68 | 203,360 | 92,242,571 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 26.07 | 52,140 | 23,650,313 | 1,842.92940 | |
| Idle Exh | 0.77 | 1,540 | 698,532 | | 2,215.31988 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 26.84 | 53,680 | 24,348,845 | | |
| PM10 Emissions | | | | | |
| Run Exh | 4.31 | 8,620 | 3,909,967 | 0.30468 | |
| Idle Exh | 0.09 | 180 | 81,647 | | 0.25893 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 4.4 | 8,800 | 3,991,614 | | |
| | | | | | |
| TireWear | 0.51 | 1,020 | 462,664 | 0.03605 | |
| BrakeWr | 0.4 | 800 | 362,874 | 0.02828 | |
| ------- | | | | | |
| Total | 5.31 | 10,620 | 4,817,152 | | |
| Lead | 0 | | | | |
| SOx | 0.26 | 520 | 235,868 | 0.01838 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2415.45 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2018 -- All model years in the range 1974 to 2018 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 63,391 | | | | |
| VMT/1000 | 13,176 | | | | |
| Trips | 320,790 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 7.24 | 14,480 | 6,568,019 | 0.49848 | |
| Idle Exh | 1.05 | 2,100 | 952,544 | | 2.96937 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 8.29 | 16,580 | 7,520,564 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 8.29 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 31.89 | 63,780 | 28,930,130 | 2.19567 | |
| Idle Exh | 5.11 | 10,220 | 4,635,715 | | 14.45093 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 37 | 74,000 | 33,565,845 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 80.18 | 160,360 | 72,738,093 | 5.52050 | |
| Idle Exh | 14.14 | 28,280 | 12,827,596 | | 39.98752 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 94.33 | 188,660 | 85,574,761 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 26.77 | 53,540 | 24,285,342 | 1,843.14985 | |
| Idle Exh | 0.78 | 1,560 | 707,604 | | 2,205.81782 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 27.55 | 55,100 | 24,992,947 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.93 | 7,860 | 3,565,237 | 0.27059 | |
| Idle Exh | 0.08 | 160 | 72,575 | | 0.22624 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 4 | 8,000 | 3,628,740 | | |
| | | | | | |
| TireWear | 0.52 | 1,040 | 471,736 | 0.03580 | |
| BrakeWr | 0.41 | 820 | 371,946 | 0.02823 | |
| ------- | | | | | |
| Total | 4.94 | 9,880 | 4,481,494 | | |
| Lead | 0 | | | | |
| SOx | 0.26 | 520 | 235,868 | 0.01790 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2479.14 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2019 -- All model years in the range 1975 to 2019 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 64,480 | | | | |
| VMT/1000 | 13,486 | | | | |
| Trips | 326,300 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.71 | 13,420 | 6,087,211 | 0.45137 | |
| Idle Exh | 1.05 | 2,100 | 952,544 | | 2.91923 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 7.75 | 15,500 | 7,030,684 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 7.75 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 30.2 | 60,400 | 27,396,987 | 2.03151 | |
| Idle Exh | 5.16 | 10,320 | 4,681,075 | | 14.34592 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 35.36 | 70,720 | 32,078,062 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 73.47 | 146,940 | 66,650,882 | 4.94223 | |
| Idle Exh | 14.46 | 28,920 | 13,117,895 | | 40.20195 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 87.93 | 175,860 | 79,768,777 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 27.39 | 54,780 | 24,847,797 | 1,842.48830 | |
| Idle Exh | 0.79 | 1,580 | 716,676 | | 2,196.37190 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 28.19 | 56,380 | 25,573,545 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.59 | 7,180 | 3,256,794 | 0.24149 | |
| Idle Exh | 0.07 | 140 | 63,503 | | 0.19462 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 3.66 | 7,320 | 3,320,297 | | |
| | | | | | |
| TireWear | 0.54 | 1,080 | 489,880 | 0.03633 | |
| BrakeWr | 0.42 | 840 | 381,018 | 0.02825 | |
| ------- | | | | | |
| Total | 4.61 | 9,220 | 4,182,123 | | |
| Lead | 0 | | | | |
| SOx | 0.27 | 540 | 244,940 | 0.01816 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2536.81 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 65,570 | | | | |
| VMT/1000 | 13,761 | | | | |
| Trips | 331,816 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 6.23 | 12,460 | 5,651,763 | 0.41071 | |
| Idle Exh | 1.04 | 2,080 | 943,472 | | 2.84336 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 7.28 | 14,560 | 6,604,307 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 7.28 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 28.7 | 57,400 | 26,036,210 | 1.89203 | |
| Idle Exh | 5.21 | 10,420 | 4,726,434 | | 14.24414 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 33.92 | 67,840 | 30,771,715 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 67.65 | 135,300 | 61,371,065 | 4.45978 | |
| Idle Exh | 14.76 | 29,520 | 13,390,051 | | 40.35384 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 82.41 | 164,820 | 74,761,116 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 27.95 | 55,900 | 25,355,821 | 1,842.58562 | |
| Idle Exh | 0.81 | 1,620 | 734,820 | | 2,214.54014 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 28.76 | 57,520 | 26,090,641 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.3 | 6,600 | 2,993,711 | 0.21755 | |
| Idle Exh | 0.06 | 120 | 54,431 | | 0.16404 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 3.36 | 6,720 | 3,048,142 | | |
| | | | | | |
| TireWear | 0.55 | 1,100 | 498,952 | 0.03626 | |
| BrakeWr | 0.43 | 860 | 390,090 | 0.02835 | |
| ------- | | | | | |
| Total | 4.33 | 8,660 | 3,928,111 | | |
| Lead | 0 | | | | |
| SOx | 0.27 | 540 | 244,940 | 0.01780 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2588.03 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:48:42
Scen Year: 2021 -- All model years in the range 1977 to 2021 selected
Season : Annual
Area : South Coast AQMD Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
Emissions: Tons Per Day

| ********** | HHDT-DSL | lbs/day | grams/day | grams/mile | grams/trip |
|---|---|---|---|---|---|
| Vehicles | 67,200 | | | | |
| VMT/1000 | 14,128 | | | | |
| Trips | 340,066 | | | | |
| Reactive Organic Gas Emissions | | | | | |
| Run Exh | 5.92 | 11,840 | 5,370,535 | 0.38013 | |
| Idle Exh | 1.05 | 2,100 | 952,544 | | 2.80106 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 6.97 | 13,940 | 6,323,079 | | |
| | | | | | |
| Diurnal | 0 | | | | |
| Hot Soak | 0 | | | | |
| Running | 0 | | | | |
| Resting | 0 | | | | |
| ------- | | | | | |
| Total | 6.97 | | | | |
| Carbon Monoxide Emissions | | | | | |
| Run Exh | 27.59 | 55,180 | 25,029,234 | 1.77160 | |
| Idle Exh | 5.31 | 10,620 | 4,817,152 | | 14.16535 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 32.9 | 65,800 | 29,846,387 | | |
| Oxides of Nitrogen Emissions | | | | | |
| Run Exh | 63.24 | 126,480 | 57,370,379 | 4.06076 | |
| Idle Exh | 15.18 | 30,360 | 13,771,068 | | 40.49528 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 78.42 | 156,840 | 71,141,448 | | |
| Carbon Dioxide Emissions (000) | | | | | |
| Run Exh | 28.77 | 57,540 | 26,099,712 | 1,847.37489 | |
| Idle Exh | 0.83 | 1,660 | 752,964 | | 2,214.16887 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 29.59 | 59,180 | 26,843,604 | | |
| PM10 Emissions | | | | | |
| Run Exh | 3.04 | 6,080 | 2,757,842 | 0.19520 | |
| Idle Exh | 0.06 | 120 | 54,431 | | 0.16006 |
| Start Ex | 0 | - | - | | - |
| ------- | | | | | |
| Total Ex | 3.1 | 6,200 | 2,812,274 | | |
| | | | | | |
| TireWear | 0.56 | 1,120 | 508,024 | 0.03596 | |
| BrakeWr | 0.44 | 880 | 399,161 | 0.02825 | |
| ------- | | | | | |
| Total | 4.1 | 8,200 | 3,719,459 | | |
| Lead | 0 | | | | |
| SOx | 0.28 | 560 | 254,012 | 0.01798 | |
| Fuel Consumption (000 gallons) | | | | | |
| Gasoline | 0 | | | | |
| Diesel | 2663.52 | | | | |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2014 -- Model Years 1970 to 2014 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 10.302 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 45.288 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 116.253 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.133 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 1.135 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2015 -- Model Years 1971 to 2015 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 9.875 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 44.682 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 117.427 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.137 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.995 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2016 -- All model years in the range 1972 to 2016 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2016 -- Model Years 1972 to 2016 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 9.518 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 44.171 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 118.404 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.136 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.873 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2017 -- All model years in the range 1973 to 2017 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2017 -- Model Years 1973 to 2017 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 9.207 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 43.725 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 119.252 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.764 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2018 -- All model years in the range 1974 to 2018 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2018 -- Model Years 1974 to 2018 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.947 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 43.349 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 119.963 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.669 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2019 -- All model years in the range 1975 to 2019 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2019 -- Model Years 1975 to 2019 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.727 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 43.027 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 120.566 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.585 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2020 -- Model Years 1976 to 2020 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.541 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 42.753 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 121.076 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.135 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.512 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Title : Los Angeles County Avg Annual All CYrs 2014 to 2021 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/02/04 15:37:57
Scen Year: 2021 -- All model years in the range 1977 to 2021 selected
Season : Annual
Area : South Coast AQMD
**********

Year: 2021 -- Model Years 1977 to 2021 Inclusive --
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 8.384 |

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 42.52 |

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 121.509 |

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 6617.134 |

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.063 |

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0.447 |

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

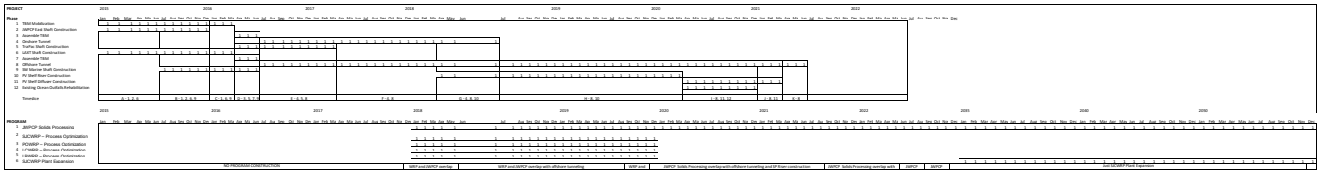
Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 50%

| Speed MPH | HHD DSL |
|---|---|
| 0 | 0 |

# Project Construction GHG Calculations

# Alternative 2

**Project and Program Schedule and Max Overlap (Alternative 2)**



**PROJECT EMISSION CALCULATIONS**

Phase 1 — TBM Mobiliz… — Start 2015

| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydraulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydraulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| | Unmitigated Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydraulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydraulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | On Site Total | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | Total | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 2 — JWPCP East … — Start 2015

| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydraulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydraulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydraulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydraulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| | | | | | | | | | | | | | On Site Total | | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 2.4 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| | | | | | | | | | | | | | | Total | | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase 3 — Assemble TBM — Start 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | On Site Total | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 4 — Onshore — Start 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 1 | 12 | 59520 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 1 | 12 | 28800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 1 | 24 | 71040 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.01 | 0.02 | 2294.94 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 0.25 | 0.37 | 40653.18 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.12 | 0.18 | 19670.89 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 0.30 | 0.44 | 48521.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.31 | 1.69 | 5.04 | 0.00 | 0.00 | 0.00 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.92 | 0.14 | | | | | | | | | 0.92 | 0.14 | | | | |
| | | | | | | | | | | | | | On Site Total | | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.6 | 85.6 | 16.9 | 0.2 | 2.2 | 1.3 | 184474.9 | 1.2 | 1.7 | 185012.5 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| | | | | | | | | | | | | | | | Total | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 8 | 5 | 243611 | 2 | 2 | 244341 |

Phase 5 — TraPac Shaft — Start 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.92 | 14.12 | 31.41 | 0.05 | 1.20 | 1.07 | 4652.56 | 0.35 | 0.00 | 4659.98 | 0.72 | 14.12 | 4.71 | 0.05 | 0.66 | 0.58 | 4652.56 | 0.06 | 0.00 | 4653.91 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.84 | 9.21 | 19.54 | 0.04 | 0.70 | 0.62 | 4439.05 | 0.26 | 0.00 | 4444.44 | 0.52 | 9.21 | 2.93 | 0.04 | 0.38 | 0.34 | 4439.05 | 0.05 | 0.00 | 4440.04 |
| Hydaulic Excavator - Medium | 0.80 | 2.56 | 5.99 | 0.01 | 0.20 | 0.18 | 1199.74 | 0.07 | 0.00 | 1201.26 | 0.15 | 2.56 | 0.90 | 0.01 | 0.11 | 0.10 | 1199.74 | 0.01 | 0.00 | 1200.02 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.87 | 2.71 | 7.27 | 0.01 | 0.25 | 0.22 | 1187.64 | 0.08 | 0.00 | 1189.28 | 0.16 | 2.71 | 1.09 | 0.01 | 0.14 | 0.12 | 1187.64 | 0.01 | 0.00 | 1187.94 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.77 | 2.37 | 5.67 | 0.01 | 0.19 | 0.17 | 1079.77 | 0.07 | 0.00 | 1081.22 | 0.14 | 2.37 | 0.85 | 0.01 | 0.10 | 0.09 | 1079.77 | 0.01 | 0.00 | 1080.03 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| On Site Total | 11.3 | 38.7 | 87.8 | 0.2 | 3.6 | 2.8 | 15550.2 | 1.0 | 0.0 | 15571.2 | 2.2 | 38.6 | 15.7 | 0.2 | 2.2 | 1.6 | 15550.2 | 0.2 | 0.0 | 15554.0 |
| On-Road Truck | 10.66 | 44.92 | 121.07 | 0.31 | 7.05 | 5.84 | 31697.93 | 0.09 | 0.08 | 31725.36 | 4.88 | 24.36 | 53.53 | 0.30 | 2.93 | 2.04 | 31697.93 | 0.09 | 0.08 | 31725.36 |
| On-Road Truck | 0.91 | 4.22 | 11.31 | 0.00 | 0.08 | 0.08 | 629.25 | 0.00 | 0.00 | 629.25 | 0.73 | 3.95 | 11.81 | 0.00 | 0.00 | 0.00 | 629.25 | 0.00 | 0.00 | 629.25 |
| On-Road Crew Vehicle | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 |
| On-Road Crew Vehicle | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 |
| Total | 23 | 88 | 217 | 0 | 11 | 9 | 48069 | 1 | 0 | 48130 | 8 | 67 | 78 | 0 | 5 | 4 | 48069 | 0 | 0 | 48113 |

Phase 6 — LAXT Shaft — Start 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 2.4 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase 7 — Assemble TBM — Start 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 8 — Offshore ... — Start 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 200 | 200 | 1.00 | 1 | 24 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 8.000 | 8.000 | 1.00 | 1 | 12 | 96000 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 3.760 | 3.760 | 1.00 | 1 | 12 | 45120 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 3.600 | 3.600 | 1.00 | 1 | 24 | 86400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) a | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 282 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 7050 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 282 | 16920 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 282 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 0.40 | 0.60 | 65569.65 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 0.19 | 0.28 | 30817.74 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 0.36 | 0.54 | 59012.68 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 | 0.40 | 2.15 | 6.40 | 0.00 | 0.01 | 0.01 | 342.82 | 0.00 | 0.00 | 342.82 |
| Fugitive Dust | | | | | 1.17 | 0.18 | | | | | | | | | 1.17 | 0.18 | | | | |
| On Site Total | 10.8 | 86.2 | 149.5 | 0.2 | 6.2 | 5.0 | 231945.3 | 9.8 | 2.1 | 232797.4 | 4.7 | 86.1 | 18.2 | 0.2 | 2.4 | 1.3 | 231945.3 | 1.5 | 2.1 | 232623.4 |
| On-Road Truck | 23.12 | 97.45 | 262.63 | 0.68 | 15.30 | 12.66 | 68760.13 | 0.19 | 0.18 | 68819.63 | 10.58 | 52.84 | 116.11 | 0.64 | 6.36 | 4.42 | 68760.13 | 0.19 | 0.18 | 68819.63 |
| On-Road Truck | 1.97 | 9.15 | 24.53 | 0.00 | 0.18 | 0.17 | 1364.98 | 0.00 | 0.00 | 1364.98 | 1.58 | 8.57 | 25.62 | 0.00 | 0.00 | 0.00 | 1364.98 | 0.00 | 0.00 | 1364.98 |
| On-Road Crew Vehicle | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| Total | 37 | 206 | 432 | 1 | 22 | 18 | 305929 | 10 | 3 | 306986 | 18 | 161 | 155 | 1 | 9 | 6 | 305929 | 2 | 3 | 306812 |

**Phase 9** SW Marine — Start 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.3** | **40.0** | **17.1** | **0.2** | **2.4** | **1.7** | **15550.2** | **0.2** | **0.0** | **15554.2** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

**Phase 10** PV Shelf — Start 2018

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.480 | 3.765 | 3.233 | 0.007 | 0.203 | 0.181 | 568.300 | 0.043 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.416 | 1.522 | 3.117 | 0.005 | 0.118 | 0.105 | 549.583 | 0.038 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.414 | 3.288 | 2.759 | 0.006 | 0.146 | 0.130 | 568.300 | 0.037 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.325 | 1.139 | 1.916 | 0.006 | 0.069 | 0.061 | 568.300 | 0.029 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.334 | 1.189 | 2.146 | 0.006 | 0.072 | 0.064 | 568.300 | 0.030 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.346 | 1.259 | 2.438 | 0.006 | 0.087 | 0.078 | 568.300 | 0.031 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.369 | 1.247 | 2.804 | 0.006 | 0.095 | 0.085 | 568.300 | 0.033 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.442 | 3.727 | 3.133 | 0.007 | 0.189 | 0.168 | 568.300 | 0.040 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.355 | 1.218 | 2.277 | 0.006 | 0.077 | 0.068 | 568.300 | 0.032 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 3 | 2 | 2418 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 3 | 2 | 147.06 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 3 | 2 | 1080 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 3 | 2 | 64.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.184 | 1.003 | 1.111 | 0.006 | 0.034 | 0.030 | 568.300 | 0.017 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.413 | 1.252 | 4.432 | 0.006 | 0.118 | 0.105 | 568.300 | 0.037 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.342 | 1.142 | 2.542 | 0.006 | 0.091 | 0.081 | 568.300 | 0.031 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.236 | 1.064 | 2.395 | 0.006 | 0.077 | 0.068 | 568.300 | 0.021 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 |
| Tugboat - Aux | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 |
| Crew Boats | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 |
| Crew Boats - Aux | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.947 | 43.349 | 119.963 | 0.063 | 0.669 | 0.615 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.07 | 0.01 | | | | |
| **On Site Total** | **2.1** | **46.0** | **37.8** | **0.1** | **1.1** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.7** | **2.1** | **46.0** | **37.8** | **0.1** | **1.1** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.7** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.498 | 2.196 | 5.520 | 0.018 | 0.335 | 0.270 | 1843.150 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.969 | 14.451 | 39.988 | 0.000 | 0.226 | 0.208 | 2205.818 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.134 | 1.120 | 0.090 | 0.004 | 0.034 | 0.019 | 392.094 | 0.042 | 0.039 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.179 | 2.417 | 0.151 | 0.000 | 0.007 | 0.006 | 71.004 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 1.05 | 4.65 | 11.68 | 0.04 | 0.71 | 0.57 | 3900.85 | 0.01 | 0.01 | 3904.22 | 0.60 | 3.02 | 6.38 | 0.04 | 0.37 | 0.26 | 3900.85 | 0.01 | 0.01 | 3904.22 |
| On-Road Truck | 0.10 | 0.51 | 1.41 | 0.00 | 0.01 | 0.01 | 77.81 | 0.00 | 0.00 | 77.81 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.81 | 0.00 | 0.00 | 77.81 |
| On-Road Crew Vehicle | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 |
| On-Road Crew Vehicle | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 |
| **Total** | **3** | **53** | **51** | **0** | **2** | **2** | **12901** | **0** | **0** | **13041** | **3** | **51** | **45** | **0** | **1** | **1** | **12901** | **0** | **0** | **13041** |

**Phase 11 — PV Shelf — Start 2020**

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Equipment Specs** | | | | | | | **Emission Factor** | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 1 | 8 | 2580 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 1 | 8 | 9440 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 2 | 8 | 5920 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 1 | 4 | 510 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 1 | 8 | 2960 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Daily Emission Rates (lbs/day)** | | | | | | | | | | **Mitigated Daily Emission Rates (lbs/day)** | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.91 | 5.70 | 4.15 | 0.03 | 0.12 | 0.11 | 3232.39 | 0.08 | 0.00 | 3234.12 | 0.17 | 5.70 | 0.62 | 0.03 | 0.07 | 0.06 | 3232.39 | 0.02 | 0.00 | 3232.71 |
| Pipe Barge | 7.83 | 24.96 | 81.49 | 0.12 | 2.04 | 1.82 | 11827.05 | 0.71 | 0.00 | 11841.89 | 1.43 | 24.96 | 12.22 | 0.12 | 1.12 | 0.99 | 11827.05 | 0.13 | 0.00 | 11829.77 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 4.05 | 14.46 | 26.09 | 0.07 | 0.95 | 0.85 | 7416.97 | 0.37 | 0.00 | 7424.64 | 0.74 | 14.46 | 3.91 | 0.07 | 0.52 | 0.46 | 7416.97 | 0.07 | 0.00 | 7418.37 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.34 | 1.29 | 2.51 | 0.01 | 0.08 | 0.08 | 638.96 | 0.03 | 0.00 | 639.61 | 0.06 | 1.29 | 0.38 | 0.01 | 0.05 | 0.04 | 638.96 | 0.01 | 0.00 | 639.08 |
| Pump | 1.37 | 6.72 | 12.32 | 0.04 | 0.40 | 0.36 | 3708.48 | 0.12 | 0.00 | 3711.08 | 0.25 | 6.72 | 1.85 | 0.04 | 0.22 | 0.20 | 3708.48 | 0.02 | 0.00 | 3708.96 |
| On-Road Truck - Idle | 0.03 | 0.13 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.07 | 0.01 | | | | |
| **On Site Total** | **15.8** | **81.3** | **149.8** | **0.3** | **4.3** | **3.8** | **31975.2** | **1.3** | **0.2** | **32075.6** | **3.9** | **81.3** | **42.2** | **0.3** | **2.7** | **2.3** | **31975.2** | **0.3** | **0.2** | **32053.1** |
| On-Road Truck | 0.87 | 4.00 | 9.44 | 0.04 | 0.60 | 0.47 | 3899.65 | 0.01 | 0.01 | 3903.03 | 0.60 | 3.02 | 6.23 | 0.04 | 0.38 | 0.27 | 3899.65 | 0.01 | 0.01 | 3903.03 |
| On-Road Truck | 0.10 | 0.50 | 1.42 | 0.00 | 0.01 | 0.01 | 78.11 | 0.00 | 0.00 | 78.11 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.11 | 0.00 | 0.00 | 78.11 |
| On-Road Crew Vehicle | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 |
| On-Road Crew Vehicle | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 |
| **Total** | **17** | **87** | **160** | **0** | **5** | **4** | **36455** | **1** | **0** | **36575** | **5** | **86** | **50** | **0** | **3** | **3** | **36455** | **0** | **0** | **36552** |

**Phase 12 — Existing Ocean Outfalls — Start 2020**

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Equipment Specs** | | | | | | | **Emission Factor** | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Daily Emission Rates (lbs/day)** | | | | | | | | | | **Mitigated Daily Emission Rates (lbs/day)** | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 |
| On-Road Crew Vehicle | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| **Total** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** |

[a] Per CARB Regulations "A driver of a diesel-fueled motor vehicle with a gross vehicle weight rating (GVWR) greater than 10,000 pounds is prohibited from idling the vehicle's primary engine for more than 5 minutes at any location." Available http://www.arb.ca.gov/enf/diesel.htm#cmvidling.

## GHG EMISSIONS BY PHASE

| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP East Shaft Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | 7/1/2016 | 24 | 59,073 | 2 | 1 | 59,284 | 59,073 | 0 | 1 | 59,250 |
| 5 | TraPac Shaft Construction | 4/1/2016 | 12 | 5,820 | 0 | 0 | 5,828 | 5,820 | 0 | 0 | 5,825 |
| 6 | LAXT Shaft Construction | 1/1/2015 | 15 | 7,272 | 0 | 0 | 7,281 | 7,272 | 0 | 0 | 7,278 |
| 7 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 8 | Offshore Tunnel | 7/1/2016 | 61 | 185,717 | 6 | 2 | 186,358 | 185,717 | 1 | 2 | 186,253 |
| 9 | SW Marine Shaft Construction | 7/1/2015 | 12 | 5,833 | 0 | 0 | 5,841 | 5,833 | 0 | 0 | 5,839 |
| 10 | PV Shelf Riser Construction | 4/1/2018 | 24 | 3,133 | 0 | 0 | 3,167 | 3,133 | 0 | 0 | 3,167 |
| 11 | PV Shelf Diffuser Construction | 4/1/2020 | 12 | 4,414 | 0 | 0 | 4,428 | 4,414 | 0 | 0 | 4,426 |
| 12 | Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 499 | 0 | 0 | 507 | 499 | 0 | 0 | 507 |
| | Total | | | | | | 278,519 | | | | 278,368 |
| | Amortized Total | | | | | | 9,284 | | | | 9,279 |

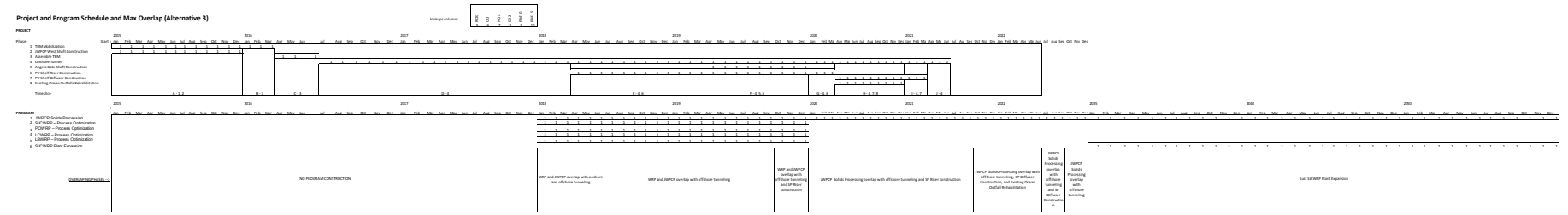
Conversion: Short Tons to Metric Tons

0.9071847

# Project Construction GHG Calculations

# Alternative 3

## Project and Program Schedule and Max Overlap (Alternative 3)



# GHG EMISSION CALCULATIONS

**Phase 1 — TBM Mobilization**

Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000 | 0.000 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | Unmitigated Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Phase 2 — JWPCP West Shaft Construction**

Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000 | 0.000 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | 11.9 | 40.1 | 97.2 | 0.2 | 3.4 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 1.9 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | 25 | 94 | 244 | 0 | 11 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase

**3** **Assemble TBM**

Start Date 2016

| Equipment | Type | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Equipment** | **Type** | **HP** | **kW** | **Power Rating** | **LF** | **Number Active** | **Equipment Hrs/Day** | **Daily Hp-hr** | **E.F. Units** | **ROG** | **CO** | **$NO_X$** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **$CO_2$** | **$CH_4$** | **$N_2O$** |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Equipment** | **ROG** | **CO** | **$NO_X$** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** | **ROG** | **CO** | **$NO_X$** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | **On Site Total** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Phase

**4** **Onshore Tunnel**

Start Date 2016

| Equipment | Type | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Equipment** | **Type** | **HP** | **kW** | **Power Rating** | **LF** | **Number Active** | **Equipment Hrs/Day** | **Daily Hp-hr** | **E.F. Units** | **ROG** | **CO** | **$NO_X$** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **$CO_2$** | **$CH_4$** | **$N_2O$** |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 1 | 12 | 59520 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 1 | 12 | 28800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 1 | 24 | 71040 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Equipment** | **ROG** | **CO** | **$NO_X$** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** | **ROG** | **CO** | **$NO_X$** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.01 | 0.02 | 2294.94 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 0.25 | 0.37 | 40653.18 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.12 | 0.18 | 19670.89 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 0.30 | 0.44 | 48521.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.31 | 1.69 | 5.04 | 0.00 | 0.00 | 0.00 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.00017 | 0.000025 | | | | | | | | 0.92 | 0.14 | | | | | | | | | 0.46 | 0.07 | | | | |
| | | | | | | | | | | | | | | **On Site Total** | **10.7** | **85.7** | **148.2** | **0.2** | **5.9** | **5.0** | **184474.9** | **7.8** | **1.7** | **185151.2** | **4.6** | **85.6** | **16.9** | **0.2** | **1.7** | **1.2** | **184474.9** | **1.2** | **1.7** | **185012.5** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| | | | | | | | | | | | | | | | **Total** | **32** | **183** | **371** | **1** | **18** | **15** | **243611** | **8** | **2** | **244480** | **16** | **147** | **125** | **1** | **7** | **5** | **243611** | **2** | **2** | **244341** |

Phase

5 Angels Gate Shaft Construction

Start Date 2019

**Equipment Specs**

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr |
|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil |
|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | |
| Fugitive Dust | | | | 3250 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed |
|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | |
| On-Road Truck | onroad | | 130 | | |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | |
| On-Road Crew Vehicle | onroad | | 20 | | |

**Emission Factor**

| Equipment | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | g/hp-hr | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| Change House | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | g/hp-hr | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| Forklift | g/hp-hr | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| Gantry Crane | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | g/hp-hr | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| Hydaulic Excavator - Medium | g/hp-hr | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| Loader | g/hp-hr | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| Motor Grader | g/hp-hr | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| Office Trailers | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | g/hp-hr | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| TBM & Trailing gear | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | g/hp-hr | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| Worker Hoist | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | g/hp-hr | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | g/hp-hr | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| Dump Barge | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Generator | g/hp-hr | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| Service Vessel | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Pump | g/hp-hr | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |
| On-Road Truck - Idle | g/idle-hr | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | lbs/ton | | | | | 0.00017 | 0.000025 | | | |
| On-Road Truck | g/mile | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 |
| On-Road Truck | g/trip | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 |
| On-Road Crew Vehicle | g/mile | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 |
| On-Road Crew Vehicle | g/trip | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 |

**Daily Emission Rates (lbs/day)**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.34 | 12.38 | 24.11 | 0.05 | 0.90 | 0.80 | 4652.56 | 0.30 | 0.00 | 4658.88 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.40 | 8.79 | 13.07 | 0.04 | 0.47 | 0.42 | 4439.05 | 0.22 | 0.00 | 4443.59 |
| Hydaulic Excavator - Medium | 0.66 | 2.49 | 3.92 | 0.01 | 0.13 | 0.12 | 1199.74 | 0.06 | 0.00 | 1201.00 |
| Loader | 1.64 | 6.12 | 10.85 | 0.03 | 0.39 | 0.35 | 2833.38 | 0.15 | 0.00 | 2836.49 |
| Motor Grader | 0.73 | 2.57 | 5.24 | 0.01 | 0.18 | 0.16 | 1187.64 | 0.07 | 0.00 | 1189.02 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.63 | 2.29 | 3.76 | 0.01 | 0.13 | 0.11 | 1079.77 | 0.06 | 0.00 | 1080.97 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.21 | 1.03 | 2.88 | 0.00 | 0.01 | 0.01 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | |
| **On Site Total** | **9.6** | **35.7** | **63.8** | **0.2** | **2.8** | **2.1** | **15550.2** | **0.8** | **0.0** | **15568.0** |
| On-Road Truck | 7.76 | 34.93 | 84.99 | 0.31 | 5.26 | 4.19 | 31683.00 | 0.09 | 0.08 | 31710.43 |
| On-Road Truck | 0.84 | 4.11 | 11.52 | 0.00 | 0.06 | 0.05 | 629.47 | 0.00 | 0.00 | 629.47 |
| On-Road Crew Vehicle | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 |
| On-Road Crew Vehicle | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| **Total** | **18** | **75** | **158** | **0** | **8** | **6** | **48053** | **1** | **0** | **48109** |

**Mitigated Daily Emission Rates (lbs/day)**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.61 | 12.38 | 3.62 | 0.05 | 0.49 | 0.44 | 4652.56 | 0.06 | 0.00 | 4653.71 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.44 | 8.79 | 1.96 | 0.04 | 0.26 | 0.23 | 4439.05 | 0.04 | 0.00 | 4439.88 |
| Hydaulic Excavator - Medium | 0.12 | 2.49 | 0.59 | 0.01 | 0.07 | 0.06 | 1199.74 | 0.01 | 0.00 | 1199.97 |
| Loader | 0.30 | 6.12 | 1.63 | 0.03 | 0.21 | 0.19 | 2833.38 | 0.03 | 0.00 | 2833.95 |
| Motor Grader | 0.13 | 2.57 | 0.79 | 0.01 | 0.10 | 0.09 | 1187.64 | 0.01 | 0.00 | 1187.89 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.12 | 2.29 | 0.56 | 0.01 | 0.07 | 0.06 | 1079.77 | 0.01 | 0.00 | 1079.99 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.27 | 0.04 | | | | |
| **On Site Total** | **1.9** | **35.6** | **12.1** | **0.2** | **1.5** | **1.1** | **15550.2** | **0.2** | **0.0** | **15553.4** |
| On-Road Truck | 4.91 | 24.55 | 51.18 | 0.32 | 3.05 | 2.15 | 31683.00 | 0.09 | 0.08 | 31710.43 |
| On-Road Truck | 0.73 | 3.96 | 11.80 | 0.00 | 0.00 | 0.00 | 629.47 | 0.00 | 0.00 | 629.47 |
| On-Road Crew Vehicle | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 |
| On-Road Crew Vehicle | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| **Total** | **7** | **64** | **72** | **0** | **5** | **3** | **48053** | **0** | **0** | **48095** |

Phase

6 PV Shelf Riser Construction

Start Date 2018

**Equipment Specs**

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr |
|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 3 | 2 | 2418 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 3 | 2 | 147.06 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 3 | 2 | 1080 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 3 | 2 | 64.5 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil |
|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | |
| Fugitive Dust | | | | 400 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed |
|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | |
| On-Road Truck | onroad | | 16 | | |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | |
| On-Road Crew Vehicle | onroad | | 30 | | |

**Emission Factor**

| Equipment | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | g/hp-hr | 0.480 | 3.765 | 3.233 | 0.007 | 0.203 | 0.181 | 568.300 | 0.043 | 0.000 |
| Change House | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | g/hp-hr | 0.416 | 1.522 | 3.117 | 0.005 | 0.118 | 0.105 | 549.583 | 0.038 | 0.000 |
| Forklift | g/hp-hr | 0.414 | 3.288 | 2.759 | 0.006 | 0.146 | 0.130 | 568.300 | 0.037 | 0.000 |
| Gantry Crane | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | g/hp-hr | 0.325 | 1.139 | 1.916 | 0.006 | 0.069 | 0.061 | 568.300 | 0.029 | 0.000 |
| Hydaulic Excavator - Medium | g/hp-hr | 0.334 | 1.189 | 2.146 | 0.006 | 0.072 | 0.064 | 568.300 | 0.030 | 0.000 |
| Loader | g/hp-hr | 0.346 | 1.259 | 2.438 | 0.006 | 0.087 | 0.078 | 568.300 | 0.031 | 0.000 |
| Motor Grader | g/hp-hr | 0.369 | 1.247 | 2.804 | 0.006 | 0.095 | 0.085 | 568.300 | 0.033 | 0.000 |
| Office Trailers | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | g/hp-hr | 0.442 | 3.727 | 3.133 | 0.007 | 0.189 | 0.168 | 568.300 | 0.040 | 0.000 |
| TBM & Trailing gear | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | g/hp-hr | 0.355 | 1.218 | 2.277 | 0.006 | 0.077 | 0.068 | 568.300 | 0.032 | 0.000 |
| Worker Hoist | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | g/hp-hr | 0.184 | 1.003 | 1.111 | 0.006 | 0.034 | 0.030 | 568.300 | 0.017 | 0.000 |
| Pipe Barge | g/hp-hr | 0.413 | 1.252 | 4.432 | 0.006 | 0.118 | 0.105 | 568.300 | 0.037 | 0.000 |
| Dump Barge | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Generator | g/hp-hr | 0.342 | 1.142 | 2.542 | 0.006 | 0.091 | 0.081 | 568.300 | 0.031 | 0.000 |
| Service Vessel | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | g/hp-hr | 0.342 | 1.179 | 2.864 | 0.006 | 0.095 | 0.084 | 568.300 | 0.031 | 0.000 |
| Pump | g/hp-hr | 0.236 | 1.064 | 2.395 | 0.006 | 0.077 | 0.068 | 568.300 | 0.021 | 0.000 |
| On-Road Truck - Idle | g/idle-hr | 8.947 | 43.349 | 119.963 | 0.063 | 0.669 | 0.615 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | lbs/ton | | | | | 0.00017 | 0.000025 | | | |
| On-Road Truck | g/mile | 0.498 | 2.196 | 5.520 | 0.018 | 0.335 | 0.270 | 1843.150 | 0.005 | 0.005 |
| On-Road Truck | g/trip | 2.969 | 14.451 | 39.988 | 0.000 | 0.226 | 0.208 | 2205.818 | 0.000 | 0.000 |
| On-Road Crew Vehicle | g/mile | 0.134 | 1.120 | 0.090 | 0.004 | 0.034 | 0.019 | 392.094 | 0.042 | 0.039 |
| On-Road Crew Vehicle | g/trip | 0.179 | 2.417 | 0.151 | 0.000 | 0.007 | 0.006 | 71.004 | 0.000 | 0.000 |

**Daily Emission Rates (lbs/day)**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 |
| Tugboat - Aux | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 |
| Crew Boats | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 |
| Crew Boats - Aux | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | |
| **On Site Total** | **2.1** | **46.0** | **37.8** | **0.1** | **1.1** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.7** |
| On-Road Truck | 1.05 | 4.65 | 11.68 | 0.04 | 0.71 | 0.57 | 3900.85 | 0.01 | 0.01 | 3904.22 |
| On-Road Truck | 0.10 | 0.51 | 1.41 | 0.00 | 0.01 | 0.01 | 77.81 | 0.00 | 0.00 | 77.81 |
| On-Road Crew Vehicle | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 |
| On-Road Crew Vehicle | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 |
| **Total** | **3** | **53** | **51** | **0** | **2** | **2** | **12901** | **0** | **0** | **13041** |

**Mitigated Daily Emission Rates (lbs/day)**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 1.21 | 26.65 | 21.78 | 0.03 | 0.59 | 0.54 | 4882.47 | 0.03 | 0.22 | 4951.77 |
| Tugboat - Aux | 0.07 | 1.62 | 1.32 | 0.00 | 0.04 | 0.03 | 296.95 | 0.00 | 0.01 | 301.16 |
| Crew Boats | 0.54 | 11.90 | 9.73 | 0.01 | 0.26 | 0.24 | 2180.76 | 0.01 | 0.10 | 2211.71 |
| Crew Boats - Aux | 0.03 | 0.71 | 0.58 | 0.00 | 0.02 | 0.01 | 130.24 | 0.00 | 0.01 | 132.09 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.03 | 0.00 | | | | |
| **On Site Total** | **2.1** | **46.0** | **37.8** | **0.1** | **1.0** | **0.9** | **8418.5** | **0.0** | **0.4** | **8537.7** |
| On-Road Truck | 0.60 | 3.02 | 6.38 | 0.04 | 0.37 | 0.26 | 3900.85 | 0.01 | 0.01 | 3904.22 |
| On-Road Truck | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.81 | 0.00 | 0.00 | 77.81 |
| On-Road Crew Vehicle | 0.18 | 1.48 | 0.12 | 0.01 | 0.04 | 0.03 | 518.64 | 0.05 | 0.05 | 535.71 |
| On-Road Crew Vehicle | 0.01 | 0.16 | 0.01 | 0.00 | 0.00 | 0.00 | 4.70 | 0.00 | 0.00 | 4.70 |
| **Total** | **3** | **51** | **45** | **0** | **1** | **1** | **12901** | **0** | **0** | **13041** |

Phase

**7 PV Shelf Diffuser Construction**

Start Date 2020

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 1 | 8 | 2580 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 1 | 8 | 9440 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 2 | 8 | 5920 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 1 | 4 | 510 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 1 | 8 | 2960 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |
| | | Daily Trips | Idle Time (min) [a] | | Tons Soil | | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | 16 | 5 | | | | | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | | 400 | | | | lbs/ton | | | | | 0.00017 | 0.000025 | | | |
| | | | Miles / Trip | Daily Trips | | Miles / Day | Acres Disturbed | | | | | | | | | | | |
| On-Road Truck | onroad | | 60 | 16 | | 960 | | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 |
| On-Road Truck | onroad | | | 16 | | | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | | 20 | 30 | | 600 | | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 |
| On-Road Crew Vehicle | onroad | | | 30 | | | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.91 | 5.70 | 4.15 | 0.03 | 0.12 | 0.11 | 3232.39 | 0.08 | 0.00 | 3234.12 | 0.17 | 5.70 | 0.62 | 0.03 | 0.07 | 0.06 | 3232.39 | 0.02 | 0.00 | 3232.71 |
| Pipe Barge | 7.83 | 24.96 | 81.49 | 0.12 | 2.04 | 1.82 | 11827.05 | 0.71 | 0.00 | 11841.89 | 1.43 | 24.96 | 12.22 | 0.12 | 1.12 | 0.99 | 11827.05 | 0.13 | 0.00 | 11829.77 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 4.05 | 14.46 | 26.09 | 0.07 | 0.95 | 0.85 | 7416.97 | 0.37 | 0.00 | 7424.64 | 0.74 | 14.46 | 3.91 | 0.07 | 0.52 | 0.46 | 7416.97 | 0.07 | 0.00 | 7418.37 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.34 | 1.29 | 2.51 | 0.01 | 0.08 | 0.08 | 638.96 | 0.03 | 0.00 | 639.61 | 0.06 | 1.29 | 0.38 | 0.01 | 0.05 | 0.04 | 638.96 | 0.01 | 0.00 | 639.08 |
| Pump | 1.37 | 6.72 | 12.32 | 0.04 | 0.40 | 0.36 | 3708.48 | 0.12 | 0.00 | 3711.08 | 0.25 | 6.72 | 1.85 | 0.04 | 0.22 | 0.20 | 3708.48 | 0.02 | 0.00 | 3708.96 |
| On-Road Truck - Idle | 0.03 | 0.13 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.03 | 0.00 | | | | |
| **On Site Total** | **15.8** | **81.3** | **149.8** | **0.3** | **4.3** | **3.8** | **31975.2** | **1.3** | **0.2** | **32075.6** | **3.9** | **81.3** | **42.2** | **0.3** | **2.6** | **2.3** | **31975.2** | **0.3** | **0.2** | **32053.1** |
| On-Road Truck | 0.87 | 4.00 | 9.44 | 0.04 | 0.60 | 0.47 | 3899.65 | 0.01 | 0.01 | 3903.03 | 0.60 | 3.02 | 6.23 | 0.04 | 0.38 | 0.27 | 3899.65 | 0.01 | 0.01 | 3903.03 |
| On-Road Truck | 0.10 | 0.50 | 1.42 | 0.00 | 0.01 | 0.01 | 78.11 | 0.00 | 0.00 | 78.11 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.11 | 0.00 | 0.00 | 78.11 |
| On-Road Crew Vehicle | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 | 0.16 | 1.28 | 0.10 | 0.01 | 0.04 | 0.03 | 516.92 | 0.05 | 0.05 | 532.88 |
| On-Road Crew Vehicle | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 4.68 | 0.00 | 0.00 | 4.68 |
| **Total** | **17** | **87** | **160** | **0** | **5** | **4** | **36455** | **1** | **0** | **36575** | **5** | **86** | **50** | **0** | **3** | **3** | **36455** | **0** | **0** | **36552** |

Phase

**8 Existing Ocean Outfalls Rehabilitation**

Start Date 2020

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |
| | | Daily Trips | Idle Time (min) [a] | | Tons Soil | | | | | | | | | | | | | |
| On-Road Truck - Idle | onroad | - | 5 | | | | | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | | 0 | | | | lbs/ton | | | | | 0.00017 | 0.000025 | | | |
| | | | Miles / Trip | Daily Trips | | Miles / Day | Acres Disturbed | | | | | | | | | | | |
| On-Road Truck | onroad | | 60 | 0 | | 0 | | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 |
| On-Road Truck | onroad | | | 0 | | | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | | 20 | 20 | | 400 | | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 |
| On-Road Crew Vehicle | onroad | | | 20 | | | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 |
| On-Road Crew Vehicle | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| **Total** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** |

[a] Per CARB Regulations "A driver of a diesel-fueled motor vehicle with a gross vehicle weight rating (GVWR) greater than 10,000 pounds is prohibited from idling the vehicle's primary engine for more than 5 minutes at any location." Available http://www.arb.ca.gov/enf/diesel.htm#cmvidling.

## GHG'S BY PHASE

| Phase | | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 1 | TBM Mobilization | | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP West Shaft Construction | | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | | 7/1/2016 | 61 | 147,886 | 5 | 1 | 148,413 | 147,886 | 1 | 1 | 148,329 |
| 5 | Angels Gate Shaft Construction | | 4/1/2019 | 9 | 4,380 | 0 | 0 | 4,385 | 4,380 | 0 | 0 | 4,383 |
| 6 | PV Shelf Riser Construction | | 4/1/2018 | 24 | 3,133 | 0 | 0 | 3,167 | 3,133 | 0 | 0 | 3,167 |
| 7 | PV Shelf Diffuser Construction | | 4/1/2020 | 12 | 4,414 | 0 | 0 | 4,428 | 4,414 | 0 | 0 | 4,426 |
| 8 | Existing Ocean Outfalls Rehabilitation | | 4/1/2020 | 9 | 499 | 0 | 0 | 507 | 499 | 0 | 0 | 507 |
| 9 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 10 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 11 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 12 | | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| | Total | | | | | | | 166,725 | | | | 166,635 |
| | Amortized Total | | | | | | | 5,558 | | | | 5,554 |

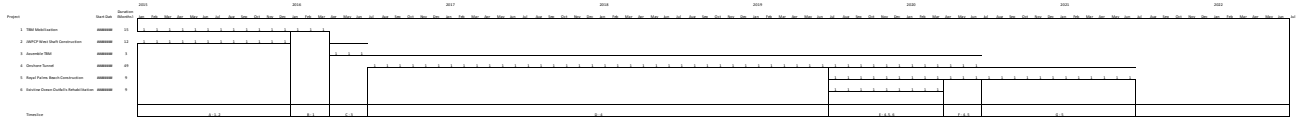
Conversion: Short Tons to Metric Tons

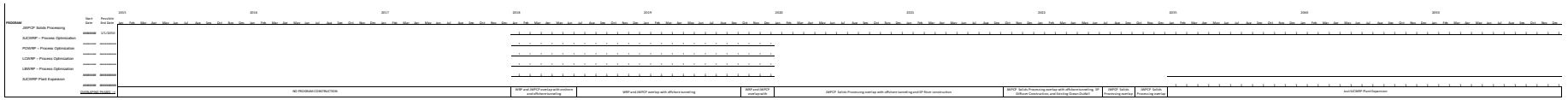
0.9071847

# Project Construction GHG Calculations

# Alternative 4

## Project and Program Schedule and Max Overlap



## PROJECT EMISSION CALCULATIONS

Phase 1 — TBM Mobilization — Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Unmitigated Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 2 — JWPCP West Shaft Site Construction — Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day) ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| | | | | | | | | | | | | | | On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.3 | 40.0 | 17.1 | 0.2 | 2.4 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| | | | | | | | | | | | | | | | Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase 3 — Assemble TBM

Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mit. ROG | Mit. CO | Mit. $NO_X$ | Mit. $SO_2$ | Mit. $PM_{10}$ | Mit. $PM_{2.5}$ | Mit. $CO_2$ | Mit. $CH_4$ | Mit. $N_2O$ | Mit. $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | On Site Total | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mit. ROG | Mit. CO | Mit. $NO_X$ | Mit. $SO_2$ | Mit. $PM_{10}$ | Mit. $PM_{2.5}$ | Mit. $CO_2$ | Mit. $CH_4$ | Mit. $N_2O$ | Mit. $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Phase 4 — Tunneling

Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | | Emission Factor | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 1 | 12 | 59520 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 1 | 12 | 28800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 1 | 24 | 71040 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.00 | 0.00 | 262.28 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.02 | 0.03 | 3278.48 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.00 | 0.00 | 327.85 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.01 | 0.01 | 917.98 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.01 | 0.02 | 2294.94 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.00 | 0.00 | 437.13 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.00 | 0.00 | 491.77 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.00 | 0.00 | 245.89 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.00 | 0.00 | 131.14 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 0.25 | 0.37 | 40653.18 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.12 | 0.18 | 19670.89 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 0.25 | 0.38 | 41527.44 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.11 | 0.17 | 18359.50 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.01 | 0.01 | 1639.24 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 0.30 | 0.44 | 48521.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.37 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mit. ROG | Mit. CO | Mit. $NO_X$ | Mit. $SO_2$ | Mit. $PM_{10}$ | Mit. $PM_{2.5}$ | Mit. $CO_2$ | Mit. $CH_4$ | Mit. $N_2O$ | Mit. $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.31 | 1.69 | 5.04 | 0.00 | 0.00 | 0.00 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.92 | 0.14 | | | | | | | | | 0.92 | 0.14 | | | | |
| | | | | | | | | | | | | | On Site Total | | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.6 | 85.6 | 16.9 | 0.2 | 2.2 | 1.3 | 184474.9 | 1.2 | 1.7 | 185012.5 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mit. ROG | Mit. CO | Mit. $NO_X$ | Mit. $SO_2$ | Mit. $PM_{10}$ | Mit. $PM_{2.5}$ | Mit. $CO_2$ | Mit. $CH_4$ | Mit. $N_2O$ | Mit. $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| | | | | | | | | | | | | | | | Total | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 8 | 5 | 243611 | 2 | 2 | 244341 |

Phase 5 — Royal Palms Shaft Site Construction

Start Date 2019

| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |

| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.34 | 12.38 | 24.11 | 0.05 | 0.90 | 0.80 | 4652.56 | 0.30 | 0.00 | 4658.88 | 0.61 | 12.38 | 3.62 | 0.05 | 0.49 | 0.44 | 4652.56 | 0.06 | 0.00 | 4653.71 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.40 | 8.79 | 13.07 | 0.04 | 0.47 | 0.42 | 4439.05 | 0.22 | 0.00 | 4443.59 | 0.44 | 8.79 | 1.96 | 0.04 | 0.26 | 0.23 | 4439.05 | 0.04 | 0.00 | 4439.88 |
| Hydaulic Excavator - Medium | 0.66 | 2.49 | 3.92 | 0.01 | 0.13 | 0.12 | 1199.74 | 0.06 | 0.00 | 1201.00 | 0.12 | 2.49 | 0.59 | 0.01 | 0.07 | 0.06 | 1199.74 | 0.01 | 0.00 | 1199.97 |
| Loader | 1.64 | 6.12 | 10.85 | 0.03 | 0.39 | 0.35 | 2833.38 | 0.15 | 0.00 | 2836.49 | 0.30 | 6.12 | 1.63 | 0.03 | 0.21 | 0.19 | 2833.38 | 0.03 | 0.00 | 2833.95 |
| Motor Grader | 0.73 | 2.57 | 5.24 | 0.01 | 0.18 | 0.16 | 1187.64 | 0.07 | 0.00 | 1189.02 | 0.13 | 2.57 | 0.79 | 0.01 | 0.10 | 0.09 | 1187.64 | 0.01 | 0.00 | 1187.89 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.63 | 2.29 | 3.76 | 0.01 | 0.13 | 0.11 | 1079.77 | 0.06 | 0.00 | 1080.97 | 0.12 | 2.29 | 0.56 | 0.01 | 0.07 | 0.06 | 1079.77 | 0.01 | 0.00 | 1079.99 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 | 0.21 | 1.03 | 2.88 | 0.00 | 0.01 | 0.01 | 158.04 | 0.00 | 0.00 | 158.04 | 0.18 | 0.99 | 2.95 | 0.00 | 0.00 | 0.00 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.54 | 0.08 | | | | | | | | | 0.54 | 0.08 | | | | |
| | | | | | | | | | | | | | | **On Site Total** | **9.6** | **35.7** | **63.8** | **0.2** | **2.8** | **2.1** | **15550.2** | **0.8** | **0.0** | **15568.0** | **1.9** | **35.6** | **12.1** | **0.2** | **1.8** | **1.2** | **15550.2** | **0.2** | **0.0** | **15553.4** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 | 7.76 | 34.93 | 84.99 | 0.31 | 5.26 | 4.19 | 31683.00 | 0.09 | 0.08 | 31710.43 | 4.91 | 24.55 | 51.18 | 0.32 | 3.05 | 2.15 | 31683.00 | 0.09 | 0.08 | 31710.43 |
| On-Road Truck | onroad | | 130 | | | g/trip | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 | 0.84 | 4.11 | 11.52 | 0.00 | 0.06 | 0.05 | 629.47 | 0.00 | 0.00 | 629.47 | 0.73 | 3.96 | 11.80 | 0.00 | 0.00 | 0.00 | 629.47 | 0.00 | 0.00 | 629.47 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 | 0.11 | 0.92 | 0.07 | 0.00 | 0.03 | 0.02 | 345.15 | 0.04 | 0.03 | 356.16 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| | | | | | | | | | | | | | | | **Total** | **18** | **75** | **158** | **0** | **8** | **6** | **48053** | **1** | **0** | **48109** | **7** | **64** | **72** | **0** | **5** | **3** | **48053** | **0** | **0** | **48095** |

Phase 6 — Existing Ocean Outfalls Rehabilitation

Start Date 2020

| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.402 | 3.736 | 2.706 | 0.007 | 0.142 | 0.126 | 568.300 | 0.036 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.374 | 1.410 | 2.598 | 0.005 | 0.097 | 0.086 | 549.583 | 0.034 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.358 | 3.288 | 2.141 | 0.006 | 0.112 | 0.099 | 568.300 | 0.032 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.290 | 1.115 | 1.461 | 0.006 | 0.053 | 0.047 | 568.300 | 0.026 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.296 | 1.172 | 1.606 | 0.006 | 0.055 | 0.049 | 568.300 | 0.027 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.313 | 1.202 | 1.936 | 0.006 | 0.070 | 0.062 | 568.300 | 0.028 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.331 | 1.215 | 2.235 | 0.006 | 0.076 | 0.068 | 568.300 | 0.030 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.385 | 3.719 | 2.621 | 0.007 | 0.135 | 0.120 | 568.300 | 0.035 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.316 | 1.198 | 1.718 | 0.006 | 0.059 | 0.052 | 568.300 | 0.028 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.161 | 1.003 | 0.730 | 0.006 | 0.021 | 0.019 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.199 | 3.916 | 0.006 | 0.098 | 0.087 | 568.300 | 0.034 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.310 | 1.108 | 1.999 | 0.006 | 0.073 | 0.065 | 568.300 | 0.028 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.226 | 5.000 | 4.085 | 0.006 | 0.110 | 0.101 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.306 | 1.145 | 2.229 | 0.006 | 0.075 | 0.067 | 568.300 | 0.028 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.210 | 1.030 | 1.888 | 0.006 | 0.062 | 0.055 | 568.300 | 0.019 | 0.000 |

| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.80 | 17.77 | 14.52 | 0.02 | 0.39 | 0.36 | 3254.98 | 0.02 | 0.15 | 3301.18 |
| Tugboat - Aux | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 1.08 | 0.88 | 0.00 | 0.02 | 0.02 | 197.96 | 0.00 | 0.01 | 200.77 |
| Crew Boats | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 | 0.18 | 3.97 | 3.24 | 0.00 | 0.09 | 0.08 | 726.92 | 0.00 | 0.03 | 737.24 |
| Crew Boats - Aux | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 | 0.01 | 0.24 | 0.19 | 0.00 | 0.01 | 0.00 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 | 0.22 | 4.96 | 4.05 | 0.01 | 0.11 | 0.10 | 908.65 | 0.01 | 0.04 | 921.55 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 8.541 | 42.753 | 121.076 | 0.063 | 0.512 | 0.471 | 6617.135 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.0002 | 0.00002 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | **On Site Total** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** | **1.3** | **28.0** | **22.9** | **0.0** | **0.6** | **0.6** | **5131.9** | **0.0** | **0.2** | **5204.8** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.411 | 1.892 | 4.460 | 0.018 | 0.282 | 0.221 | 1842.586 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 2.843 | 14.244 | 40.354 | 0.000 | 0.164 | 0.151 | 2214.540 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.124 | 0.971 | 0.076 | 0.004 | 0.034 | 0.019 | 390.791 | 0.039 | 0.036 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 | 0.11 | 0.86 | 0.07 | 0.00 | 0.03 | 0.02 | 344.61 | 0.03 | 0.03 | 355.25 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.146 | 2.025 | 0.122 | 0.000 | 0.007 | 0.006 | 70.690 | 0.000 | 0.000 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 3.12 | 0.00 | 0.00 | 3.12 |
| | | | | | | | | | | | | | | | **Total** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** | **1** | **29** | **23** | **0** | **1** | **1** | **5480** | **0** | **0** | **5563** |

[a] Per CARB Regulations "A driver of a diesel-fueled motor vehicle with a gross vehicle weight rating (GVWR) greater than 10,000 pounds is prohibited from idling the vehicle's primary engine for more than 5 minutes at any location." Available http://www.arb.ca.gov/enf/diesel.htm#cmvidling.

| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP West Shaft Site Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Tunneling | 7/1/2016 | 49 | 118,309 | 4 | 1 | 118,731 | 118,309 | 1 | 1 | 118,663 |
| 5 | Royal Palms Shaft Site Construction | 4/1/2019 | 9 | 4,380 | 0 | 0 | 4,385 | 4,380 | 0 | 0 | 4,383 |
| 6 | Existing Ocean Outfalls Rehabilitation | 4/1/2020 | 9 | 499 | 0 | 0 | 507 | 499 | 0 | 0 | 507 |
| 7 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 8 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 9 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 10 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 11 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| 12 | 0 | 1/0/1900 | 0 | - | - | - | - | - | - | - | - |
| | Total | | | | | | 129,447 | | | | 129,377 |
| | Amortized Total | | | | | | 4,315 | | | | 4,313 |

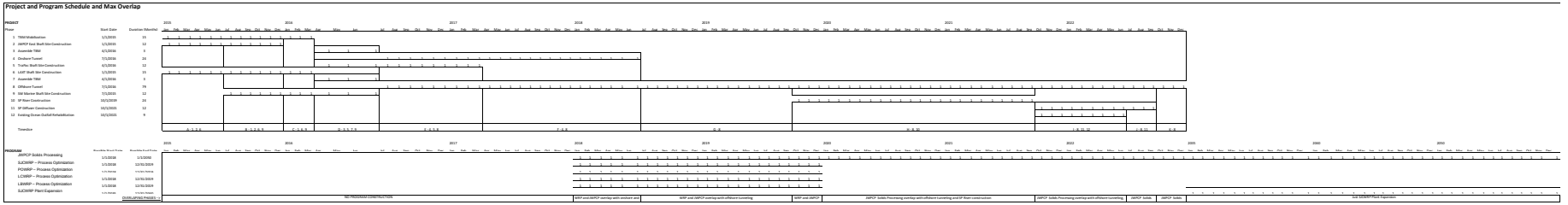
Conversion: Short Tons to Metric Tons

0.9071847

# Project Construction GHG Calculations

# Alternative 5

## Project and Program Schedule and Max Overlap



## PROJECT EMISSION CALCULATIONS

**Phase 1 — TBM Mobilization**
Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.6 | 3.8 | 4.3 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.5 | 1.8 | 4.0 | 0.0 | 0.2 | 0.1 | 549.6 | 0.0 | 0.0 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.5 | 3.3 | 4.0 | 0.0 | 0.2 | 0.2 | 568.3 | 0.0 | 0.0 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.4 | 1.2 | 2.8 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.2 | 3.2 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.4 | 1.4 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.4 | 1.3 | 3.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | offroad | - | 2,400 | 2,400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.6 | 3.8 | 4.2 | 0.0 | 0.3 | 0.3 | 568.3 | 0.1 | 0.0 |
| TBM & Trailing gear | offroad | - | 2.240 | 2.240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | offroad | - | 2,960 | 2,960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.3 | 3.4 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.9 | 0.0 | 0.0 |
| Tugboats | offroad | 1.300 | - | 1.300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.6 | 2.2 | 7.5 | 0.0 | 0.4 | 0.3 | 915.9 | 0.0 | 0.0 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.0 | 3.9 | 9.0 | 0.0 | 0.6 | 0.5 | 915.9 | 0.0 | 0.0 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.7 | 2.4 | 10.7 | 0.0 | 0.4 | 0.4 | 915.9 | 0.0 | 0.0 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.3 | 6.9 | 6.7 | 0.0 | 0.6 | 0.5 | 915.9 | 0.0 | 0.0 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.2 | 1.0 | 1.9 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Pipe Barge | offroad | 2.000 | - | 2.000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.5 | 1.4 | 5.3 | 0.0 | 0.2 | 0.1 | 568.3 | 0.0 | 0.0 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.4 | 1.3 | 3.5 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.7 | 2.4 | 10.7 | 0.0 | 0.4 | 0.4 | 915.9 | 0.0 | 0.0 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.3 | 2.6 | 4.7 | 0.0 | 0.1 | 0.1 | 35.0 | 0.0 | 0.0 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.4 | 1.3 | 4.0 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.3 | 1.2 | 3.3 | 0.0 | 0.1 | 0.1 | 568.3 | 0.0 | 0.0 |

| Equipment | Unmitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Change House | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Compressor (2000 cfm) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crawler Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forklift | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gantry Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Large | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydaulic Excavator - Medium | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Motor Grader | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Trailers | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft and Tunnel Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shaft Pump | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (mechanical) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Shop (welding) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Site Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (discharge) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Circuit Pumps (feed) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Slurry Separation Plant | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Street Sweeper | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TBM & Trailing gear | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tower Crane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunnel Ventilation Fans | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Truck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Worker Hoist | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboats | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tugboat - Aux | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crew Boats - Aux | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Crane Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pipe Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dump Barge | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Generator | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Service Vessel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Locomotives | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hoist | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pump | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Item | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Item | Unmitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |

| Item | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Item | Unmitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**Phase 2 — JWPCP East Shaft Site Construction**
Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Item | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Item | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.4** | **40.1** | **17.0** | **0.2** | **2.2** | **1.7** | **15550.2** | **0.2** | **0.0** | **15554.2** |

| Item | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Item | Daily ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

**Phase 3 — Assemble TBM**

Start Date 2016

**Equipment Specs**

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |

**Emission Factor**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

**Daily Emission Rates (lbs/day)** and **Mitigated Daily Emission Rates (lbs/day)**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | On Site Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | | | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Phase 4 — Onshore Tunnel**

Start Date 2016

**Equipment Specs**

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 1 | 24 | 3360 | g/kW-hr |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 1 | 12 | 59520 | g/kW-hr |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 1 | 12 | 28800 | g/kW-hr |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 1 | 19 | 60800 | g/kW-hr |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 1 | 24 | 71040 | g/kW-hr |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |

**Emission Factor**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

**Daily Emission Rates (lbs/day)** and **Mitigated Daily Emission Rates (lbs/day)**

| Equipment | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2288.16 | 0.10 | 0.02 | 2296.64 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40533.03 | 1.68 | 0.37 | 40683.34 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 19612.76 | 0.81 | 0.18 | 19685.49 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 48378.14 | 2.01 | 0.44 | 48557.54 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 222 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 | 0.39 | 1.80 | 4.83 | 0.00 | 0.04 | 0.03 | 269.88 | 0.00 | 0.00 | 269.88 |
| Fugitive Dust | | | | 5550 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | | | | | | 0.92 | 0.14 | | | | | | | | | 0.46 | 0.07 | | | | |
| | | | | | | | | | | | | | | On Site Total | 10.7 | 85.7 | 148.2 | 0.2 | 5.9 | 5.0 | 184474.9 | 7.8 | 1.7 | 185151.2 | 4.7 | 85.7 | 16.7 | 0.2 | 1.8 | 1.3 | 184474.9 | 7.5 | 1.7 | 185145.1 |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | Daily ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated ROG | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 222 | 13320 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 | 18.20 | 76.71 | 206.75 | 0.53 | 12.04 | 9.97 | 54130.32 | 0.15 | 0.14 | 54177.16 | 8.33 | 41.59 | 91.41 | 0.51 | 5.01 | 3.48 | 54130.32 | 0.15 | 0.14 | 54177.16 |
| On-Road Truck | onroad | | 222 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 | 1.55 | 7.21 | 19.31 | 0.00 | 0.14 | 0.13 | 1074.56 | 0.00 | 0.00 | 1074.56 | 1.25 | 6.74 | 20.17 | 0.00 | 0.00 | 0.00 | 1074.56 | 0.00 | 0.00 | 1074.56 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| | | | | | | | | | | | | | | | Total | 32 | 183 | 371 | 1 | 18 | 15 | 243611 | 8 | 2 | 244480 | 16 | 147 | 125 | 1 | 7 | 5 | 243611 | 8 | 2 | 244474 |

Phase 5

TraPac Shaft Site Construction

Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 3.92 | 14.12 | 31.41 | 0.05 | 1.20 | 1.07 | 4652.56 | 0.35 | 0.00 | 4659.98 | 0.72 | 14.12 | 4.71 | 0.05 | 0.66 | 0.58 | 4652.56 | 0.06 | 0.00 | 4653.91 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 2.84 | 9.21 | 19.54 | 0.04 | 0.70 | 0.62 | 4439.05 | 0.26 | 0.00 | 4444.44 | 0.52 | 9.21 | 2.93 | 0.04 | 0.38 | 0.34 | 4439.05 | 0.05 | 0.00 | 4440.04 |
| Hydaulic Excavator - Medium | 0.80 | 2.56 | 5.99 | 0.01 | 0.20 | 0.18 | 1199.74 | 0.07 | 0.00 | 1201.26 | 0.15 | 2.56 | 0.90 | 0.01 | 0.11 | 0.10 | 1199.74 | 0.01 | 0.00 | 1200.02 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.87 | 2.71 | 7.27 | 0.01 | 0.25 | 0.22 | 1187.64 | 0.08 | 0.00 | 1189.28 | 0.16 | 2.71 | 1.09 | 0.01 | 0.14 | 0.12 | 1187.64 | 0.01 | 0.00 | 1187.94 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.77 | 2.37 | 5.67 | 0.01 | 0.19 | 0.17 | 1079.77 | 0.07 | 0.00 | 1081.22 | 0.14 | 2.37 | 0.85 | 0.01 | 0.10 | 0.09 | 1079.77 | 0.01 | 0.00 | 1080.03 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.23 | 1.05 | 2.83 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| On Site Total | 11.3 | 38.7 | 87.8 | 0.2 | 3.6 | 2.8 | 15550.2 | 1.0 | 0.0 | 15571.2 | 2.3 | 38.7 | 15.6 | 0.2 | 2.0 | 1.6 | 15550.2 | 0.2 | 0.0 | 15554.0 |
| On-Road Truck | 10.66 | 44.92 | 121.07 | 0.31 | 7.05 | 5.84 | 31697.93 | 0.09 | 0.08 | 31725.36 | 4.88 | 24.36 | 53.53 | 0.30 | 2.93 | 2.04 | 31697.93 | 0.09 | 0.08 | 31725.36 |
| On-Road Truck | 0.91 | 4.22 | 11.31 | 0.00 | 0.08 | 0.08 | 629.25 | 0.00 | 0.00 | 629.25 | 0.73 | 3.95 | 11.81 | 0.00 | 0.00 | 0.00 | 629.25 | 0.00 | 0.00 | 629.25 |
| On-Road Crew Vehicle | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 | 0.13 | 1.14 | 0.09 | 0.00 | 0.03 | 0.02 | 346.97 | 0.04 | 0.04 | 359.08 |
| On-Road Crew Vehicle | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 | 0.01 | 0.13 | 0.01 | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 3.15 |
| Total | 23 | 88 | 217 | 0 | 11 | 9 | 48069 | 1 | 0 | 48130 | 8 | 67 | 78 | 0 | 5 | 4 | 48069 | 0 | 0 | 48113 |

Phase 6

LAXT Shaft Site Construction

Start Date 2015

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| On Site Total | 11.9 | 40.1 | 97.2 | 0.2 | 4.0 | 3.1 | 15550.2 | 1.1 | 0.0 | 15572.4 | 2.4 | 40.1 | 17.0 | 0.2 | 2.2 | 1.7 | 15550.2 | 0.2 | 0.0 | 15554.2 |
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| Total | 25 | 94 | 244 | 0 | 12 | 10 | 48047 | 1 | 0 | 48109 | 8 | 68 | 81 | 0 | 5 | 4 | 48047 | 0 | 0 | 48091 |

Phase

**7 Assemble TBM**

Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 0 | 0 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 0 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Phase

**8 Offshore Tunnel**

Start Date 2016

| Equipment | Type | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Equipment Specs | | | | | | | Emission Factor | | | | | | | | | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.582 | 3.804 | 3.893 | 0.007 | 0.282 | 0.251 | 568.300 | 0.052 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 1 | 24 | 384 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 1 | 12 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.463 | 1.668 | 3.710 | 0.005 | 0.142 | 0.126 | 549.583 | 0.042 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 2 | 6 | 1044 | g/hp-hr | 0.496 | 3.293 | 3.572 | 0.006 | 0.194 | 0.173 | 568.300 | 0.045 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 1 | 3 | 480 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.364 | 1.179 | 2.501 | 0.006 | 0.089 | 0.079 | 568.300 | 0.033 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.378 | 1.213 | 2.837 | 0.006 | 0.094 | 0.084 | 568.300 | 0.034 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.383 | 1.339 | 3.031 | 0.006 | 0.108 | 0.096 | 568.300 | 0.035 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.414 | 1.299 | 3.478 | 0.006 | 0.119 | 0.106 | 568.300 | 0.037 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 1 | 24 | 1344 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 200 | 200 | 1.00 | 1 | 24 | 4800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 1 | 8 | 640 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 1 | 12 | 720 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 1 | 6 | 360 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 1 | 24 | 192 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 8,000 | 8,000 | 1.00 | 1 | 12 | 96000 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 3.760 | 3.760 | 1.00 | 1 | 12 | 45120 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 1 | 19 | 60800 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 1 | 12 | 734.4 | g/hp-hr | 0.524 | 3.743 | 3.752 | 0.007 | 0.259 | 0.230 | 568.300 | 0.047 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 1 | 12 | 26880 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 1 | 10 | 2400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 3.600 | 3.600 | 1.00 | 1 | 24 | 86400 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.403 | 1.245 | 2.984 | 0.006 | 0.100 | 0.089 | 568.300 | 0.036 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 1 | 3 | 84 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.211 | 1.003 | 1.625 | 0.006 | 0.053 | 0.047 | 568.300 | 0.019 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.450 | 1.341 | 4.994 | 0.006 | 0.140 | 0.125 | 568.300 | 0.041 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.376 | 1.211 | 3.172 | 0.006 | 0.112 | 0.099 | 568.300 | 0.034 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 5 | 12 | 11100 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.383 | 1.227 | 3.629 | 0.006 | 0.118 | 0.105 | 568.300 | 0.035 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.267 | 1.130 | 2.984 | 0.006 | 0.094 | 0.084 | 568.299 | 0.024 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 261.50 | 0.01 | 0.00 | 262.47 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 1.14 | 7.58 | 8.22 | 0.01 | 0.45 | 0.40 | 1307.99 | 0.10 | 0.00 | 1310.15 | 0.21 | 7.58 | 1.23 | 0.01 | 0.36 | 0.32 | 1307.99 | 0.02 | 0.00 | 1308.39 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 326.88 | 0.01 | 0.00 | 328.09 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 1.91 | 6.68 | 15.11 | 0.03 | 0.54 | 0.48 | 2833.38 | 0.17 | 0.00 | 2836.99 | 0.35 | 6.68 | 2.27 | 0.03 | 0.29 | 0.26 | 2833.38 | 0.03 | 0.00 | 2834.04 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 915.26 | 0.04 | 0.01 | 918.66 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3268.79 | 0.14 | 0.03 | 3280.91 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.84 | 0.02 | 0.00 | 437.46 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 490.32 | 0.02 | 0.00 | 492.14 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 245.16 | 0.01 | 0.00 | 246.07 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 130.75 | 0.01 | 0.00 | 131.24 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65375.86 | 2.72 | 0.60 | 65618.29 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30726.65 | 1.28 | 0.28 | 30840.60 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41404.71 | 1.72 | 0.38 | 41558.25 |
| Street Sweeper | 0.85 | 6.06 | 6.08 | 0.01 | 0.42 | 0.37 | 920.10 | 0.08 | 0.00 | 921.71 | 0.12 | 6.06 | 0.99 | 0.01 | 0.25 | 0.22 | 920.10 | 0.01 | 0.00 | 920.34 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18305.24 | 0.76 | 0.17 | 18373.12 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1634.40 | 0.07 | 0.01 | 1640.46 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 58838.27 | 2.44 | 0.54 | 59056.46 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.20 | 0.00 | 0.00 | 57.42 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 6.42 | 63.62 | 113.91 | 0.13 | 3.58 | 3.55 | 855.39 | 0.05 | 0.02 | 863.21 | 3.61 | 63.62 | 7.34 | 0.13 | 0.36 | 0.35 | 855.39 | 0.05 | 0.02 | 863.21 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 10.31 | | | | | | | | | | | | | | | | | | | |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 282 | 5 | | g/idle-hr | 9.518 | 44.171 | 118.404 | 0.063 | 0.873 | 0.803 | 6617.136 | 0.000 | 0.000 |
| Fugitive Dust | | | | 7050 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 | 0.49 | 2.29 | 6.13 | 0.00 | 0.05 | 0.04 | 342.82 | 0.00 | 0.00 | 342.82 |
| Fugitive Dust | | | | | 1.17 | 0.18 | | | | | | | | | 0.59 | 0.09 | | | | |
| **On Site Total** | **21.1** | **86.2** | **149.5** | **0.2** | **6.2** | **5.0** | **231945.3** | **9.8** | **2.1** | **232797.4** | **4.8** | **86.2** | **18.0** | **0.2** | **1.9** | **1.3** | **231945.3** | **9.5** | **2.1** | **232791.4** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 282 | 16920 | | g/mile | 0.620 | 2.612 | 7.041 | 0.018 | 0.410 | 0.339 | 1843.357 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 282 | | | g/trip | 3.162 | 14.725 | 39.462 | 0.000 | 0.293 | 0.269 | 2195.589 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 240 | 4800 | | g/mile | 0.144 | 1.294 | 0.106 | 0.004 | 0.033 | 0.019 | 393.462 | 0.044 | 0.041 |
| On-Road Crew Vehicle | onroad | | 240 | | | g/trip | 0.219 | 2.876 | 0.186 | 0.000 | 0.007 | 0.006 | 71.311 | 0.000 | 0.000 |

| Equipment | Daily ROG | Daily CO | Daily $NO_X$ | Daily $SO_2$ | Daily $PM_{10}$ | Daily $PM_{2.5}$ | Daily $CO_2$ | Daily $CH_4$ | Daily $N_2O$ | Daily $CO_2e$ | Mitigated ROG | Mitigated CO | Mitigated $NO_X$ | Mitigated $SO_2$ | Mitigated $PM_{10}$ | Mitigated $PM_{2.5}$ | Mitigated $CO_2$ | Mitigated $CH_4$ | Mitigated $N_2O$ | Mitigated $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 23.12 | 97.45 | 262.63 | 0.68 | 15.30 | 12.66 | 68760.13 | 0.19 | 0.18 | 68819.63 | 10.58 | 52.84 | 116.11 | 0.64 | 6.36 | 4.42 | 68760.13 | 0.19 | 0.18 | 68819.63 |
| On-Road Truck | 1.97 | 9.15 | 24.53 | 0.00 | 0.18 | 0.17 | 1364.98 | 0.00 | 0.00 | 1364.98 | 1.58 | 8.57 | 25.62 | 0.00 | 0.00 | 0.00 | 1364.98 | 0.00 | 0.00 | 1364.98 |
| On-Road Crew Vehicle | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 | 1.53 | 13.70 | 1.13 | 0.04 | 0.35 | 0.20 | 4163.62 | 0.47 | 0.44 | 4308.95 |
| On-Road Crew Vehicle | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 | 0.12 | 1.52 | 0.10 | 0.00 | 0.00 | 0.00 | 37.73 | 0.00 | 0.00 | 37.74 |
| **Total** | **47.35** | **206** | **432** | **1** | **22** | **18** | **305929** | **10** | **3** | **306986** | **18** | **161** | **155** | **1** | **9** | **6** | **305929** | **10** | **3** | **306980** |

Phase

**9** **SW Marine Shaft Site Construction**
Start Date 2015

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.640 | 3.827 | 4.274 | 0.007 | 0.326 | 0.290 | 568.300 | 0.058 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 2 | 6 | 3840 | g/hp-hr | 0.487 | 1.762 | 4.036 | 0.005 | 0.155 | 0.138 | 549.584 | 0.044 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.538 | 3.296 | 4.008 | 0.006 | 0.219 | 0.195 | 568.300 | 0.049 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 1 | 12 | 3543.12 | g/hp-hr | 0.384 | 1.206 | 2.839 | 0.006 | 0.101 | 0.090 | 568.300 | 0.035 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 1 | 8 | 957.6 | g/hp-hr | 0.401 | 1.228 | 3.224 | 0.006 | 0.107 | 0.095 | 568.300 | 0.036 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 2 | 6 | 2261.52 | g/hp-hr | 0.403 | 1.392 | 3.367 | 0.006 | 0.120 | 0.107 | 568.300 | 0.036 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 1 | 6 | 947.94 | g/hp-hr | 0.439 | 1.334 | 3.859 | 0.006 | 0.132 | 0.118 | 568.300 | 0.040 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.594 | 3.765 | 4.156 | 0.007 | 0.310 | 0.276 | 568.300 | 0.054 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 1 | 8 | 861.84 | g/hp-hr | 0.428 | 1.262 | 3.375 | 0.006 | 0.112 | 0.100 | 568.300 | 0.039 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 0 | 2 | 0 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 0 | 2 | 0 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 0 | 2 | 0 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.223 | 1.003 | 1.915 | 0.006 | 0.063 | 0.056 | 568.300 | 0.020 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.474 | 1.420 | 5.321 | 0.006 | 0.153 | 0.136 | 568.300 | 0.043 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.394 | 1.262 | 3.540 | 0.006 | 0.123 | 0.110 | 568.300 | 0.036 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 0 | 2 | 0 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.405 | 1.259 | 4.034 | 0.006 | 0.131 | 0.116 | 568.300 | 0.037 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.286 | 1.180 | 3.327 | 0.006 | 0.104 | 0.093 | 568.300 | 0.026 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 4.13 | 14.92 | 34.17 | 0.05 | 1.31 | 1.17 | 4652.56 | 0.37 | 0.00 | 4660.38 | 0.75 | 14.92 | 5.13 | 0.05 | 0.72 | 0.64 | 4652.56 | 0.07 | 0.00 | 4653.99 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 3.00 | 9.42 | 22.18 | 0.04 | 0.79 | 0.70 | 4439.05 | 0.27 | 0.00 | 4444.74 | 0.55 | 9.42 | 3.33 | 0.04 | 0.43 | 0.38 | 4439.05 | 0.05 | 0.00 | 4440.09 |
| Hydaulic Excavator - Medium | 0.85 | 2.59 | 6.81 | 0.01 | 0.23 | 0.20 | 1199.74 | 0.08 | 0.00 | 1201.35 | 0.15 | 2.59 | 1.02 | 0.01 | 0.12 | 0.11 | 1199.74 | 0.01 | 0.00 | 1200.04 |
| Loader | 2.01 | 6.94 | 16.79 | 0.03 | 0.60 | 0.53 | 2833.38 | 0.18 | 0.00 | 2837.19 | 0.37 | 6.94 | 2.52 | 0.03 | 0.33 | 0.29 | 2833.38 | 0.03 | 0.00 | 2834.08 |
| Motor Grader | 0.92 | 2.79 | 8.06 | 0.01 | 0.28 | 0.25 | 1187.64 | 0.08 | 0.00 | 1189.38 | 0.17 | 2.79 | 1.21 | 0.01 | 0.15 | 0.13 | 1187.64 | 0.02 | 0.00 | 1187.96 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.81 | 2.40 | 6.41 | 0.01 | 0.21 | 0.19 | 1079.77 | 0.07 | 0.00 | 1081.31 | 0.15 | 2.40 | 0.96 | 0.01 | 0.12 | 0.10 | 1079.77 | 0.01 | 0.00 | 1080.05 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboat - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crew Boats - Aux | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 130 | 5 | | g/idle-hr | 9.875 | 44.682 | 117.427 | 0.063 | 0.995 | 0.915 | 6617.137 | 0.000 | 0.000 |
| Fugitive Dust | | | | 3250 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 | 0.24 | 1.07 | 2.80 | 0.00 | 0.02 | 0.02 | 158.04 | 0.00 | 0.00 | 158.04 |
| Fugitive Dust | | | | | 0.54 | 0.08 | | | | | | | | | 0.27 | 0.04 | | | | |
| **On Site Total** | **11.9** | **40.1** | **97.2** | **0.2** | **4.0** | **3.1** | **15550.2** | **1.1** | **0.0** | **15572.4** | **2.4** | **40.1** | **17.0** | **0.2** | **2.2** | **1.7** | **15550.2** | **0.2** | **0.0** | **15554.2** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 130 | 7800 | | g/mile | 0.695 | 2.873 | 8.036 | 0.018 | 0.457 | 0.383 | 1841.943 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 130 | | | g/trip | 3.278 | 14.900 | 39.156 | 0.000 | 0.328 | 0.302 | 2205.131 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.150 | 1.384 | 0.116 | 0.004 | 0.033 | 0.019 | 392.216 | 0.045 | 0.043 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.242 | 3.130 | 0.206 | 0.000 | 0.006 | 0.006 | 71.455 | 0.000 | 0.000 |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 11.94 | 49.41 | 138.19 | 0.31 | 7.86 | 6.58 | 31673.62 | 0.09 | 0.08 | 31701.05 | 4.89 | 24.04 | 55.22 | 0.33 | 2.81 | 1.94 | 31673.62 | 0.09 | 0.08 | 31701.05 |
| On-Road Truck | 0.94 | 4.27 | 11.22 | 0.00 | 0.09 | 0.09 | 631.98 | 0.00 | 0.00 | 631.98 | 0.75 | 3.97 | 11.79 | 0.00 | 0.00 | 0.00 | 631.98 | 0.00 | 0.00 | 631.98 |
| On-Road Crew Vehicle | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 | 0.13 | 1.22 | 0.10 | 0.00 | 0.03 | 0.02 | 345.87 | 0.04 | 0.04 | 358.35 |
| On-Road Crew Vehicle | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 | 0.01 | 0.14 | 0.01 | 0.00 | 0.00 | 0.00 | 3.15 | 0.00 | 0.00 | 3.15 |
| **Total** | **25** | **94** | **244** | **0** | **12** | **10** | **48047** | **1** | **0** | **48109** | **8** | **68** | **81** | **0** | **5** | **4** | **48047** | **0** | **0** | **48091** |

Phase

**10** **SP Riser Cosntruction**
Start Date 2019

| Equipment | Type | Equipment Specs: HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | E.F. Units | Emission Factor: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr | 0.437 | 3.748 | 2.951 | 0.007 | 0.170 | 0.151 | 568.300 | 0.039 | 0.000 |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr | 0.394 | 1.462 | 2.848 | 0.005 | 0.107 | 0.095 | 549.583 | 0.036 | 0.000 |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr | 0.384 | 3.288 | 2.431 | 0.006 | 0.128 | 0.114 | 568.300 | 0.035 | 0.000 |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr | 0.307 | 1.125 | 1.673 | 0.006 | 0.061 | 0.054 | 568.300 | 0.028 | 0.000 |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.313 | 1.180 | 1.855 | 0.006 | 0.063 | 0.056 | 568.300 | 0.028 | 0.000 |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr | 0.329 | 1.228 | 2.176 | 0.006 | 0.078 | 0.070 | 568.300 | 0.030 | 0.000 |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr | 0.349 | 1.230 | 2.508 | 0.006 | 0.085 | 0.076 | 568.300 | 0.032 | 0.000 |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | offroad | - | 4,960 | 4,960 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr | 0.413 | 3.724 | 2.871 | 0.007 | 0.161 | 0.144 | 568.300 | 0.037 | 0.000 |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr | 0.334 | 1.207 | 1.976 | 0.006 | 0.067 | 0.060 | 568.300 | 0.030 | 0.000 |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 3 | 2 | 2418 | g/hp-hr | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 3 | 2 | 147.06 | g/hp-hr | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 3 | 2 | 1080 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 3 | 2 | 64.5 | g/hp-hr | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr | 0.170 | 1.003 | 0.888 | 0.006 | 0.025 | 0.022 | 568.300 | 0.015 | 0.000 |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr | 0.395 | 1.223 | 4.169 | 0.006 | 0.108 | 0.096 | 568.300 | 0.036 | 0.000 |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.326 | 1.122 | 2.262 | 0.006 | 0.082 | 0.073 | 568.300 | 0.029 | 0.000 |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr | 0.323 | 1.161 | 2.530 | 0.006 | 0.084 | 0.075 | 568.300 | 0.029 | 0.000 |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr | 0.222 | 1.044 | 2.134 | 0.006 | 0.069 | 0.061 | 568.300 | 0.020 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated Daily Emission Rates (lbs/day): ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 3.07 | 11.50 | 39.98 | 0.03 | 1.93 | 1.77 | 4882.47 | 0.03 | 0.22 | 4951.77 | 0.90 | 11.50 | 9.60 | 0.03 | 1.05 | 0.97 | 4882.47 | 0.01 | 0.22 | 4951.35 |
| Tugboat - Aux | 0.32 | 1.28 | 2.92 | 0.00 | 0.19 | 0.18 | 296.95 | 0.00 | 0.01 | 301.16 | 0.08 | 1.28 | 0.76 | 0.00 | 0.12 | 0.11 | 296.95 | 0.00 | 0.01 | 301.13 |
| Crew Boats | 1.61 | 5.66 | 25.58 | 0.01 | 1.06 | 0.98 | 2180.76 | 0.01 | 0.10 | 2211.71 | 0.47 | 5.66 | 6.14 | 0.01 | 0.58 | 0.54 | 2180.76 | 0.00 | 0.10 | 2211.52 |
| Crew Boats - Aux | 0.32 | 0.98 | 0.96 | 0.00 | 0.08 | 0.08 | 130.24 | 0.00 | 0.01 | 132.09 | 0.08 | 0.98 | 0.25 | 0.00 | 0.05 | 0.05 | 130.24 | 0.00 | 0.01 | 132.08 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.67 | 2.36 | 10.66 | 0.01 | 0.44 | 0.41 | 908.65 | 0.01 | 0.04 | 921.55 | 0.12 | 2.36 | 1.60 | 0.01 | 0.24 | 0.22 | 908.65 | 0.00 | 0.04 | 921.45 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min) [a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.727 | 43.027 | 120.566 | 0.063 | 0.585 | 0.538 | 6617.135 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.03 | 0.13 | 0.35 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.03 | 0.00 | | | | |
| **On Site Total** | **6.0** | **21.9** | **80.4** | **0.1** | **3.8** | **3.4** | **8418.5** | **0.0** | **0.4** | **8537.7** | **1.7** | **21.9** | **18.7** | **0.1** | **2.1** | **1.9** | **8418.5** | **0.0** | **0.4** | **8537.0** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.451 | 2.032 | 4.942 | 0.018 | 0.306 | 0.243 | 1842.488 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.919 | 14.346 | 40.202 | 0.000 | 0.195 | 0.179 | 2196.372 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.129 | 1.043 | 0.083 | 0.004 | 0.034 | 0.019 | 391.398 | 0.040 | 0.038 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.161 | 2.214 | 0.136 | 0.000 | 0.007 | 0.006 | 70.846 | 0.000 | 0.000 |

| Equipment | Daily: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Mitigated: ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | 0.96 | 4.30 | 10.46 | 0.04 | 0.65 | 0.52 | 3899.45 | 0.01 | 0.01 | 3902.82 | 0.60 | 3.02 | 6.30 | 0.04 | 0.37 | 0.26 | 3899.45 | 0.01 | 0.01 | 3902.82 |
| On-Road Truck | 0.10 | 0.51 | 1.42 | 0.00 | 0.01 | 0.01 | 77.47 | 0.00 | 0.00 | 77.47 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 77.47 | 0.00 | 0.00 | 77.47 |
| On-Road Crew Vehicle | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 | 0.17 | 1.38 | 0.11 | 0.01 | 0.04 | 0.03 | 517.72 | 0.05 | 0.05 | 534.23 |
| On-Road Crew Vehicle | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 | 0.01 | 0.15 | 0.01 | 0.00 | 0.00 | 0.00 | 4.69 | 0.00 | 0.00 | 4.69 |
| **Total** | **7** | **28** | **92** | **0** | **4** | **4** | **12898** | **0** | **0** | **13037** | **3** | **27** | **26** | **0** | **2** | **2** | **12898** | **0** | **0** | **13037** |

Phase 11 — SP Diffuser Construction — Start Date 2021

| Equipment | Type | Equipment Specs | | | | | | | E.F. Units |
|---|---|---|---|---|---|---|---|---|---|
| | | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Separation Plant | offroad | - | 3,200 | 3,200 | 1.00 | 0 | 19 | 0 | g/kW-hr |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 1 | 8 | 2580 | g/hp-hr |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 1 | 8 | 9440 | g/hp-hr |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr |
| Generator | offroad | 500 | - | 500 | 0.74 | 2 | 8 | 5920 | g/hp-hr |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr |
| Hoist | offroad | 250 | - | 250 | 0.51 | 1 | 4 | 510 | g/hp-hr |
| Pump | offroad | 500 | - | 500 | 0.74 | 1 | 8 | 2960 | g/hp-hr |

| Equipment | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 2.05 | 7.67 | 26.65 | 0.02 | 1.28 | 1.18 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.60 | 7.67 | 6.40 | 0.02 | 0.70 | 0.65 | 3254.98 | 0.01 | 0.15 | 3300.90 |
| Tugboat - Aux | 0.22 | 0.85 | 1.95 | 0.00 | 0.13 | 0.12 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 0.85 | 0.51 | 0.00 | 0.08 | 0.07 | 197.96 | 0.00 | 0.01 | 200.76 |
| Crew Boats | 0.54 | 1.89 | 8.53 | 0.00 | 0.35 | 0.33 | 726.92 | 0.00 | 0.03 | 737.24 | 0.16 | 1.89 | 2.05 | 0.00 | 0.19 | 0.18 | 726.92 | 0.00 | 0.03 | 737.17 |
| Crew Boats - Aux | 0.11 | 0.33 | 0.32 | 0.00 | 0.03 | 0.03 | 43.41 | 0.00 | 0.00 | 44.03 | 0.03 | 0.33 | 0.08 | 0.00 | 0.02 | 0.02 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.86 | 5.70 | 3.38 | 0.03 | 0.10 | 0.09 | 3232.39 | 0.08 | 0.00 | 3234.03 | 0.16 | 5.70 | 0.51 | 0.03 | 0.06 | 0.05 | 3232.39 | 0.01 | 0.00 | 3232.69 |
| Pipe Barge | 7.35 | 24.46 | 76.05 | 0.12 | 1.82 | 1.62 | 11827.05 | 0.66 | 0.00 | 11840.97 | 1.34 | 24.46 | 11.41 | 0.12 | 1.00 | 0.89 | 11827.05 | 0.12 | 0.00 | 11829.60 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 3.85 | 14.31 | 22.92 | 0.07 | 0.84 | 0.75 | 7416.97 | 0.35 | 0.00 | 7424.26 | 0.70 | 14.31 | 3.44 | 0.07 | 0.46 | 0.41 | 7416.97 | 0.06 | 0.00 | 7418.30 |
| Service Vessel | 0.67 | 2.36 | 10.66 | 0.01 | 0.44 | 0.41 | 908.65 | 0.01 | 0.04 | 921.55 | 0.12 | 2.36 | 1.60 | 0.01 | 0.24 | 0.22 | 908.65 | 0.00 | 0.04 | 921.45 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.33 | 1.27 | 2.20 | 0.01 | 0.07 | 0.07 | 638.96 | 0.03 | 0.00 | 639.58 | 0.06 | 1.27 | 0.33 | 0.01 | 0.04 | 0.04 | 638.96 | 0.01 | 0.00 | 639.07 |
| Pump | 1.30 | 6.65 | 10.84 | 0.04 | 0.36 | 0.32 | 3708.48 | 0.12 | 0.00 | 3710.94 | 0.24 | 6.65 | 1.63 | 0.04 | 0.20 | 0.17 | 3708.48 | 0.02 | 0.00 | 3708.93 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | 16 | 5 | | g/idle-hr | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 |
| Fugitive Dust | | | | 400 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| On-Road Truck - Idle | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 | 0.02 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 19.45 | 0.00 | 0.00 | 19.45 |
| Fugitive Dust | | | | | 0.07 | 0.01 | | | | | | | | | 0.03 | 0.00 | | | | |
| **On Site Total** | **17.3** | **65.6** | **163.8** | **0.3** | **5.5** | **4.9** | **31975.2** | **1.3** | **0.2** | **32074.0** | **3.5** | **65.6** | **28.3** | **0.3** | **3.0** | **2.7** | **31975.2** | **0.2** | **0.2** | **32052.4** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 16 | 960 | | g/mile | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 16 | | | g/trip | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 30 | 600 | | g/mile | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 |
| On-Road Crew Vehicle | onroad | | 30 | | | g/trip | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| On-Road Truck | 0.80 | 3.75 | 8.59 | 0.04 | 0.55 | 0.42 | 3909.79 | 0.01 | 0.01 | 3913.16 | 0.60 | 3.00 | 6.17 | 0.04 | 0.38 | 0.27 | 3909.79 | 0.01 | 0.01 | 3913.16 |
| On-Road Truck | 0.10 | 0.50 | 1.43 | 0.00 | 0.01 | 0.01 | 78.10 | 0.00 | 0.00 | 78.10 | 0.09 | 0.49 | 1.45 | 0.00 | 0.00 | 0.00 | 78.10 | 0.00 | 0.00 | 78.10 |
| On-Road Crew Vehicle | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 | 0.16 | 1.21 | 0.09 | 0.01 | 0.04 | 0.03 | 518.91 | 0.05 | 0.05 | 534.32 |
| On-Road Crew Vehicle | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 | 0.01 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 | 0.00 | 4.67 |
| **Total** | **18** | **71** | **174** | **0** | **6** | **5** | **36467** | **1** | **0** | **36585** | **4** | **70** | **36** | **0** | **3** | **3** | **36467** | **0** | **0** | **36563** |

Phase 12 — Existing Ocean Outfall Rehabilitation — Start Date 2021

| Equipment | Type | Equipment Specs | | | | | | | E.F. Units |
|---|---|---|---|---|---|---|---|---|---|
| | | HP | kW | Power Rating | LF | Number Active | Equipment Hrs/Day | Daily Hp-hr | |
| Backhoe/Loader | offroad | 120 | - | 120 | 0.55 | 0 | 18 | 0 | g/hp-hr |
| Change House | offroad | - | 16 | 16 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Compressor (2000 cfm) | offroad | - | 400 | 400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Crawler Crane | offroad | 500 | - | 500 | 0.64 | 0 | 6 | 0 | g/hp-hr |
| Forklift | offroad | 145 | - | 145 | 0.60 | 0 | 6 | 0 | g/hp-hr |
| Gantry Crane | offroad | | 160 | 160 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Hydaulic Excavator - Large | offroad | 518 | - | 518 | 0.57 | 0 | 12 | 0 | g/hp-hr |
| Hydaulic Excavator - Medium | offroad | 210 | - | 210 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Loader | offroad | 349 | - | 349 | 0.54 | 0 | 6 | 0 | g/hp-hr |
| Motor Grader | offroad | 259 | - | 259 | 0.61 | 0 | 6 | 0 | g/hp-hr |
| Office Trailers | offroad | - | 56 | 56 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft and Tunnel Lighting | offroad | - | 140 | 140 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Shaft Pump | offroad | - | 80 | 80 | 1.00 | 0 | 8 | 0 | g/kW-hr |
| Shop (mechanical) | offroad | - | 60 | 60 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Shop (welding) | offroad | - | 60 | 60 | 1.00 | 0 | 6 | 0 | g/kW-hr |
| Site Lighting | offroad | - | 8 | 8 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Slurry Circuit Pumps (discharge) | offroad | - | 4.960 | 4.960 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Circuit Pumps (feed) | offroad | - | 2.400 | 2.400 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Slurry Separation Plant | offroad | - | 3.200 | 3.200 | 1.00 | 0 | 19 | 0 | g/kW-hr |
| Street Sweeper | offroad | 90 | - | 90 | 0.68 | 0 | 12 | 0 | g/hp-hr |
| TBM & Trailing gear | offroad | - | 2,240 | 2,240 | 1.00 | 0 | 12 | 0 | g/kW-hr |
| Tower Crane | offroad | | 240 | 240 | 1.00 | 0 | 10 | 0 | g/kW-hr |
| Tunnel Ventilation Fans | offroad | - | 2.960 | 2.960 | 1.00 | 0 | 24 | 0 | g/kW-hr |
| Water Truck | offroad | 189 | - | 189 | 0.57 | 0 | 8 | 0 | g/hp-hr |
| Worker Hoist | offroad | - | 28 | 28 | 1.00 | 0 | 3 | 0 | g/kW-hr |
| Tugboats | offroad | 1,300 | - | 1,300 | 0.31 | 2 | 2 | 1612 | g/hp-hr |
| Tugboat - Aux | offroad | 57 | - | 57 | 0.43 | 2 | 2 | 98.04 | g/hp-hr |
| Crew Boats | offroad | 400 | - | 400 | 0.45 | 1 | 2 | 360 | g/hp-hr |
| Crew Boats - Aux | offroad | 25 | - | 25 | 0.43 | 1 | 2 | 21.5 | g/hp-hr |
| Crane Barge | offroad | 750 | - | 750 | 0.43 | 0 | 8 | 0 | g/hp-hr |
| Pipe Barge | offroad | 2,000 | - | 2,000 | 0.59 | 0 | 8 | 0 | g/hp-hr |
| Dump Barge | offroad | 250 | - | 250 | 0.51 | 0 | 8 | 0 | g/hp-hr |
| Generator | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |
| Service Vessel | offroad | 500 | - | 500 | 0.45 | 1 | 2 | 450 | g/hp-hr |
| Locomotives | offroad | 185 | - | 185 | 1.00 | 0 | 12 | 0 | g/hp-hr |
| Hoist | offroad | 250 | - | 250 | 0.51 | 0 | 4 | 0 | g/hp-hr |
| Pump | offroad | 500 | - | 500 | 0.74 | 0 | 8 | 0 | g/hp-hr |

| Equipment | Emission Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
| Backhoe/Loader | 0.373 | 3.727 | 2.495 | 0.007 | 0.118 | 0.105 | 568.300 | 0.034 | 0.000 |
| Change House | | | | | | | 308.901 | 0.013 | 0.003 |
| Compressor (2000 cfm) | | | | | | | 308.901 | 0.013 | 0.003 |
| Crawler Crane | 0.355 | 1.365 | 2.366 | 0.005 | 0.088 | 0.078 | 549.583 | 0.032 | 0.000 |
| Forklift | 0.335 | 3.288 | 1.880 | 0.006 | 0.097 | 0.086 | 568.300 | 0.030 | 0.000 |
| Gantry Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Hydaulic Excavator - Large | 0.276 | 1.109 | 1.274 | 0.006 | 0.046 | 0.041 | 568.300 | 0.025 | 0.000 |
| Hydaulic Excavator - Medium | 0.280 | 1.166 | 1.392 | 0.006 | 0.048 | 0.043 | 568.300 | 0.025 | 0.000 |
| Loader | 0.297 | 1.179 | 1.720 | 0.006 | 0.062 | 0.056 | 568.300 | 0.027 | 0.000 |
| Motor Grader | 0.313 | 1.204 | 1.985 | 0.006 | 0.068 | 0.061 | 568.300 | 0.028 | 0.000 |
| Office Trailers | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft and Tunnel Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Shaft Pump | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (mechanical) | | | | | | | 308.901 | 0.013 | 0.003 |
| Shop (welding) | | | | | | | 308.901 | 0.013 | 0.003 |
| Site Lighting | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (discharge) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Circuit Pumps (feed) | | | | | | | 308.901 | 0.013 | 0.003 |
| Slurry Separation Plant | | | | | | | 308.901 | 0.013 | 0.003 |
| Street Sweeper | 0.355 | 3.699 | 2.402 | 0.007 | 0.110 | 0.098 | 568.300 | 0.032 | 0.000 |
| TBM & Trailing gear | | | | | | | 308.901 | 0.013 | 0.003 |
| Tower Crane | | | | | | | 308.901 | 0.013 | 0.003 |
| Tunnel Ventilation Fans | | | | | | | 308.901 | 0.013 | 0.003 |
| Water Truck | 0.300 | 1.191 | 1.495 | 0.006 | 0.051 | 0.046 | 568.300 | 0.027 | 0.000 |
| Worker Hoist | | | | | | | 308.901 | 0.013 | 0.003 |
| Tugboats | 0.576 | 2.158 | 7.500 | 0.006 | 0.362 | 0.333 | 915.918 | 0.005 | 0.042 |
| Tugboat - Aux | 1.002 | 3.940 | 9.021 | 0.006 | 0.588 | 0.541 | 915.918 | 0.005 | 0.042 |
| Crew Boats | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Crew Boats - Aux | 2.276 | 6.894 | 6.735 | 0.006 | 0.579 | 0.533 | 915.918 | 0.005 | 0.042 |
| Crane Barge | 0.152 | 1.003 | 0.594 | 0.006 | 0.018 | 0.016 | 568.300 | 0.014 | 0.000 |
| Pipe Barge | 0.353 | 1.175 | 3.655 | 0.006 | 0.087 | 0.078 | 568.300 | 0.032 | 0.000 |
| Dump Barge | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Generator | 0.295 | 1.096 | 1.756 | 0.006 | 0.064 | 0.057 | 568.300 | 0.027 | 0.000 |
| Service Vessel | 0.676 | 2.376 | 10.742 | 0.006 | 0.447 | 0.411 | 915.918 | 0.005 | 0.042 |
| Locomotives | 0.262 | 2.600 | 4.655 | 0.005 | 0.146 | 0.145 | 34.956 | 0.002 | 0.001 |
| Hoist | 0.290 | 1.133 | 1.952 | 0.006 | 0.066 | 0.059 | 568.300 | 0.026 | 0.000 |
| Pump | 0.199 | 1.019 | 1.660 | 0.006 | 0.055 | 0.049 | 568.300 | 0.018 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| Backhoe/Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change House | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor (2000 cfm) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Crawler Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forklift | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gantry Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Large | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hydaulic Excavator - Medium | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Loader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Motor Grader | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Office Trailers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft and Tunnel Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shaft Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (mechanical) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shop (welding) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Site Lighting | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (discharge) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Circuit Pumps (feed) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slurry Separation Plant | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Street Sweeper | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TBM & Trailing gear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tower Crane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tunnel Ventilation Fans | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Water Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Worker Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tugboats | 2.05 | 7.67 | 26.65 | 0.02 | 1.28 | 1.18 | 3254.98 | 0.02 | 0.15 | 3301.18 | 0.60 | 7.67 | 6.40 | 0.02 | 0.70 | 0.65 | 3254.98 | 0.01 | 0.15 | 3300.90 |
| Tugboat - Aux | 0.22 | 0.85 | 1.95 | 0.00 | 0.13 | 0.12 | 197.96 | 0.00 | 0.01 | 200.77 | 0.05 | 0.85 | 0.51 | 0.00 | 0.08 | 0.07 | 197.96 | 0.00 | 0.01 | 200.76 |
| Crew Boats | 0.54 | 1.89 | 8.53 | 0.00 | 0.35 | 0.33 | 726.92 | 0.00 | 0.03 | 737.24 | 0.16 | 1.89 | 2.05 | 0.00 | 0.19 | 0.18 | 726.92 | 0.00 | 0.03 | 737.17 |
| Crew Boats - Aux | 0.11 | 0.33 | 0.32 | 0.00 | 0.03 | 0.03 | 43.41 | 0.00 | 0.00 | 44.03 | 0.03 | 0.33 | 0.08 | 0.00 | 0.02 | 0.02 | 43.41 | 0.00 | 0.00 | 44.03 |
| Crane Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pipe Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dump Barge | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Generator | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Service Vessel | 0.67 | 2.36 | 10.66 | 0.01 | 0.44 | 0.41 | 908.65 | 0.01 | 0.04 | 921.55 | 0.12 | 2.36 | 1.60 | 0.01 | 0.24 | 0.22 | 908.65 | 0.00 | 0.04 | 921.45 |
| Locomotives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hoist | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pump | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Equipment | Type | Daily Trips | Idle Time (min)[a] | Tons Soil | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck - Idle | onroad | - | 5 | | g/idle-hr | 8.384 | 42.520 | 121.509 | 0.063 | 0.447 | 0.411 | 6617.134 | 0.000 | 0.000 |
| Fugitive Dust | | | | 0 | lbs/ton | | | | | 0.000166 | 0.0000249 | | | |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| On-Road Truck - Idle | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive Dust | | | | | 0.00 | 0.00 | | | | | | | | | 0.00 | 0.00 | | | | |
| **On Site Total** | **3.6** | **13.1** | **48.1** | **0.0** | **2.2** | **2.1** | **5131.9** | **0.0** | **0.2** | **5204.8** | **1.0** | **13.1** | **10.6** | **0.0** | **1.2** | **1.1** | **5131.9** | **0.0** | **0.2** | **5204.3** |

| Equipment | Type | Miles / Trip | Daily Trips | Miles / Day | Acres Disturbed | E.F. Units | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On-Road Truck | onroad | 60 | 0 | 0 | | g/mile | 0.380 | 1.772 | 4.061 | 0.018 | 0.259 | 0.201 | 1847.375 | 0.005 | 0.005 |
| On-Road Truck | onroad | | 0 | | | g/trip | 2.801 | 14.165 | 40.495 | 0.000 | 0.160 | 0.147 | 2214.169 | 0.000 | 0.000 |
| On-Road Crew Vehicle | onroad | 20 | 20 | 400 | | g/mile | 0.119 | 0.917 | 0.071 | 0.004 | 0.034 | 0.020 | 392.297 | 0.038 | 0.035 |
| On-Road Crew Vehicle | onroad | | 20 | | | g/trip | 0.133 | 1.862 | 0.110 | 0.000 | 0.007 | 0.006 | 70.628 | 0.000 | 0.000 |

| Equipment | Daily Emission Rates (lbs/day) | | | | | | | | | | Mitigated Daily Emission Rates (lbs/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | ROG | CO | $NO_X$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| On-Road Crew Vehicle | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 | 0.10 | 0.81 | 0.06 | 0.00 | 0.03 | 0.02 | 345.94 | 0.03 | 0.03 | 356.21 |
| On-Road Crew Vehicle | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 0.00 | 0.00 | 3.12 |
| **Total** | **4** | **14** | **48** | **0** | **2** | **2** | **5481** | **0** | **0** | **5564** | **1** | **14** | **11** | **0** | **1** | **1** | **5481** | **0** | **0** | **5564** |

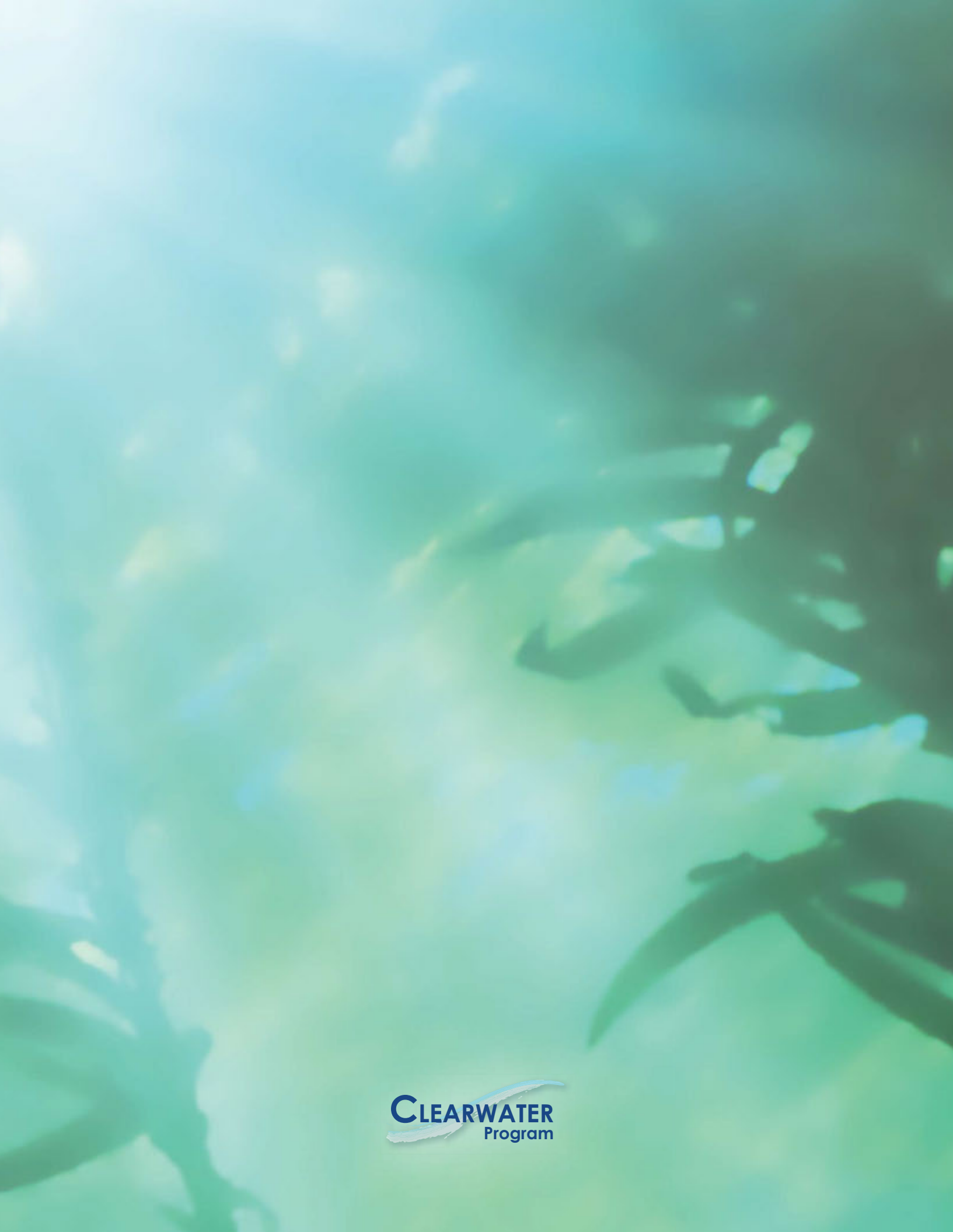
[a] Per CARB Regulations "A driver of a diesel-fueled motor vehicle with a gross vehicle weight rating (GVWR) greater than 10,000 pounds is prohibited from idling the vehicle's primary engine for more than 5 minutes at any location." Available http://www.arb.ca.gov/enf/diesel.htm#cmvidling.

## GHG'S BY PHASE

| Phase | | Start Date | Duration (Months) | Unmitigated Emissions (Metric Tons per Phase) | | | | Mitigated Emissions (Metric Tons per Phase) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** |
| 1 | TBM Mobilization | 1/1/2015 | 15 | - | - | - | - | - | - | - | - |
| 2 | JWPCP East Shaft Site Construction | 1/1/2015 | 12 | 5,817 | 0 | 0 | 5,825 | 5,817 | 0 | 0 | 5,823 |
| 3 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 4 | Onshore Tunnel | 7/1/2016 | 24 | 59,073 | 2 | 1 | 59,284 | 59,073 | 2 | 1 | 59,283 |
| 5 | TraPac Shaft Site Construction | 4/1/2016 | 12 | 5,820 | 0 | 0 | 5,828 | 5,820 | 0 | 0 | 5,825 |
| 6 | LAXT Shaft Site Construction | 1/1/2015 | 15 | 7,272 | 0 | 0 | 7,281 | 7,272 | 0 | 0 | 7,278 |
| 7 | Assemble TBM | 4/1/2016 | 3 | - | - | - | - | - | - | - | - |
| 8 | Offshore Tunnel | 7/1/2016 | 79 | 241,584 | 8 | 2 | 242,419 | 241,584 | 8 | 2 | 242,414 |
| 9 | SW Marine Shaft Site Construction | 7/1/2015 | 12 | 5,833 | 0 | 0 | 5,841 | 5,833 | 0 | 0 | 5,839 |
| 10 | SP Riser Cosntruction | 10/1/2019 | 24 | 3,132 | 0 | 0 | 3,166 | 3,132 | 0 | 0 | 3,166 |
| 11 | SP Diffuser Construction | 10/1/2021 | 12 | 4,415 | 0 | 0 | 4,430 | 4,415 | 0 | 0 | 4,427 |
| 12 | Existing Ocean Outfall Rehabilitation | 10/1/2021 | 9 | 496 | 0 | 0 | 503 | 496 | 0 | 0 | 503 |
| | Total | | | | | | 334,576 | | | | 334,558 |
| | Amortized Total | | | | | | 11,153 | | | | 11,152 |

Conversion: Short Tons to Metric Tons

0.9071847


CLEARWATER
Program