SR-241 / SR-91 Express Lanes Connector Project

ORANGE COUNTY AND RIVERSIDE COUNTY, CALIFORNIA
City of Anaheim, City of Yorba Linda and City of Corona
12-ORA-241 PM 36.1/39.1
12-ORA-91 PM 14.7/18.9
08-RIV-91 PM 0.0/1.5

0K9700 / 1200020097

Water Quality Assessment Report

Prepared for:
Foothill/Eastern Transportation Corridor Agency, Project Sponsor

and for:
State of California Department of Transportation, Lead Agency

August 2015

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 USC 327.

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Water Quality Assessment Report

August 2015

STATE OF CALIFORNIA
Department of Transportation

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Division of Environmental Analysis
NPDES/Storm Water Unit

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Executive Summary

The purpose of this Water Quality Assessment Report (WQAR) is to identify the physical setting of the State Route 241/State Route 91 (SR-241/SR-91) Express Lanes Connector Project (Proposed Project) and the existing water quality, specify the regulatory framework with respect to water quality, identify potential water quality impacts associated with the project, and make recommendations for avoidance and minimization measures for potentially adverse water quality impacts. Further, the analysis developed in this WQAR fulfills the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The California Department of Transportation (Caltrans) District 12, in cooperation with the Foothill/Eastern Transportation Corridor Agency (F/ETCA) proposes the State Route 241 (SR-241) / State Route 91 (SR-91) Express Lanes Connector Project (Proposed Project) to construct a median-to-median connector between SR-241 and the tolled lanes in the median of SR-91 (SR-91 Express Lanes). SR-241 is a tolled facility, starting at the Oso Parkway interchange, in south Orange County, to its terminus at SR-91. The SR-91 Express Lanes is a two-lane tolled facility located within the median of SR-91, from State Route 55 (SR-55), to the Orange/Riverside County line (east of the SR-241 interchange). The existing interchange connects all lanes of the northbound and southbound SR-241 to non-tolled, general purpose lanes of eastbound and westbound SR-91. There is currently no direct connection between the SR-241 and the SR-91 Express Lanes.

The Proposed Project, located at the junction of SR-241 and SR-91 and in the cities of Anaheim, Yorba Linda, Corona and counties of Orange, and Riverside, would provide improved access between SR-241 and SR-91 and is proposed to be a tolled facility. The proposed median-to-median connector project encompasses 12-ORA-241 (Post Mile [PM] 36.1/39.1), 12-ORA-91 (PM 14.7/18.9), and 08 RIV-91 (PM 0.0/1.5) for a length of approximately 8.7 miles (mi).

The existing surface drainage/storm drain system along the project alignment consists of earthen swales and drop inlets that convey runoff to cross culverts, ditches, and trapezoidal channels. The culverts, ditches, and channels drain surface storm water into the Santa Ana River and, eventually, the Pacific Ocean. Surface drainage/storm water runoff under the Build Alternative would involve: the construction of new drop inlets with connecting pipes, new guard railing with dikes, median drainage systems, and deck drain systems; modification of existing drop inlets; replacement of edge drains; removal or abandonment of existing drop inlets and existing culverts; and construction of biofiltration swales and strips and media filters.

The proposed surface drainage system would be linked to the existing drainage system and would preserve the existing drainage pattern as much as possible, including draining all storm water to the Santa Ana River and ultimately to the Pacific Ocean, consistent with existing conditions. Storm water runoff from the Build Alternative would be conveyed via existing culverts, ditches, and channels to receiving waters, including the Santa Ana River, which connects directly to the Pacific Ocean. The Santa Ana River, Reach 2 (17th Street in Santa Ana to Prado Dam), is listed on the 2010 California 303(d) List of Water Quality Limited Segments as impaired for indicator bacteria. Potential impacts during construction activities include exposure of excavated soil, which would increase the potential for soil erosion compared to existing

conditions. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported via storm runoff into receiving waters. The total disturbed area during construction would be 43.9 acres (ac).

A Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented during construction. The construction SWPPP would identify the specific Best Management Practices (BMPs) to be implemented during construction so as not to cause or contribute to an exceedance of any applicable water quality standard contained in the Santa Ana Regional Water Quality Control Board (RWQCB) Basin Plan. These BMPs would be designed to meet the technology requirement stipulated in the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

Groundwater dewatering may be necessary during construction of bridge footings for the proposed bridge at the interchange of SR-91 and SR-241. If groundwater dewatering becomes necessary during construction, the Build Alternative would be required to comply with the requirements of Order No. R8-2009-0003 (NPDES No. CAG998001). This permit covers general waste discharge requirements for discharges to surface waters that pose an insignificant (de minimums) threat to water quality within the Santa Ana Region. Under this permit, discharges must comply with discharge specifications, receiving water limitations, and monitoring and reporting requirements detailed in the permit.

Pollutants of concern during operation of the Build Alternative include nutrients, pesticides, suspended solids/sediments, heavy metals, oil and grease, toxic organic compounds, and trash and debris. The Build Alternative would result in a permanent increase in impervious surface area of approximately 20.5 ac. An increase in impervious area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters.

The proposed project would implement Caltrans-approved Treatment and Design Pollution Prevention BMPs to reduce the discharge of pollutants of concern to the maximum extent practicable (MEP). Treatment BMPs being proposed as part of the project include biofiltration swales and strips and media filters to address pollutants of concern during operation of the roadway facility.

Design Pollution Prevention BMPs proposed as part of the project include dikes, overside drains, ditches, berms, swales, modifications to the existing storm drain system, the preservation of existing vegetation, and replanting new slopes with appropriate native vegetation.

Coverage under the *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit, Order 2009-0009-DWQ, as amended by 2010-0014-DWQ; NPDES No. CAS000002) and the Caltrans Statewide NPDES Storm Water Permit Order No. 2012-0011-DWQ, No. CAS000003 would be required.

Under the No Build Alternative, no improvements to the SR-241 or SR-91 Express Lanes other than routine maintenance would be made. Therefore, the No Build Alternative would result in no short-term water quality impacts from construction-related activities. In addition, under the No

Build Alternative, there would be no increases in impervious surface area at the junction of SR-241 and SR-91. Therefore, the No Build Alternative would not result in an increase in storm water runoff or long-term pollutant loading; however, existing storm water runoff would remain untreated.

With the application of Storm Water Permit Waste Discharge Requirements (including BMPs) during construction and operation of the Build Alternative, as stipulated in Measures WQ-1, WQ-2, WQ-3, WQ-4, WQ-5, and measures from the Eastern Transportation Corridor (ETC) Final EIR and Final EIS in Section 5, the Build Alternative is not anticipated to result in adverse impacts to water quality.

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List of Acronyms

ac	acre/acres
amsl	above mean sea level
APN	Assessor's Parcel Number
ASBS	Areas of Special Biological Significance
BMP	Best Management Practice
BO	biological opinion
BSA	biological survey area
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CIP	Capital Improvement Plan
CWA	Clean Water Act
CWQ	Conceptual Water Quality
DSA	Disturbed Soil Area
EO	Executive Order
EPA	United States Environmental Protection Agency
ETC	Eastern Transportation Corridor
F/ETCA	Foothill/Eastern Transportation Corridor Agency
ft	foot/feet
HA	Hydrological Areas
HOV	High-Occupancy Vehicle
HU	Hydrologic Units
KSAT	saturated hydraulic conductivity
LEDPA	least environmentally damaging practicable alternative
MCAS	Marine Corps Air Station
MEP	maximum extent practicable
mg/L	milligrams per liter
mi	mle/miles
MS4	Municipal Separate Storm Sewer System
MTBE	methyl tertbutyl ether
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NES	Natural Environment Study

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OCEMA	Orange County Environmental Management Agency
OCFCD	Orange County Flood Control District
OCFD	Orange County Fire Department
OCTA	Orange County Transportation Authority
OCWD	Orange County Water District
Orange County Basin	Coastal Plain of Orange County Groundwater Basin
PM	Post Mile
Proposed Project	State Route 241 / State Route 91 Express Lanes Connector Project
RCTC	Riverside County Transportation Commission
RMP	Runoff Management Plan
ROD	Record of Decision
RUSCE	Revised Universal Soil Loss Equation
RWQCB	Regional Water Quality Control Board
SMC	Systems Management Concept
SR-241	State Route 241
SR-91	State Route 91
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCA	Transportation Corridor Agencies
TDS	total dissolved solids
TMDL	total maximum daily loads
U.S.	United States
USACE	United States Army Corps of Engineers
USLE	Universal Soil Loss Equation
WDR	Waste Discharge Requirement
WMA	Watershed Management Areas
WPCP	Water Pollution Control Plan
WQAR	Water Quality Assessment Report
WQMP	Water Quality Management Plan

1. Introduction

1.1. Project Description

The California Department of Transportation (Caltrans) District 12, in cooperation with the Foothill/Eastern Transportation Corridor Agency (F/ETCA) proposes the State Route 241 (SR-241)/State Route 91 (SR-91) Express Lanes Connector Project (Proposed Project) to construct a median-to-median connector between SR-241 and the tolled lanes in the median of SR-91 (SR-91 Express Lanes). SR-241 is a tolled facility, starting at the Oso Parkway interchange, in south Orange County, to its terminus at SR-91. The SR-91 Express Lanes is a two-lane tolled facility located within the median of SR-91, from State Route 55 (SR-55), to the Orange/Riverside County line (east of the SR-241 interchange). The existing interchange connects all lanes of the northbound and southbound SR-241 to non-tolled, general purpose lanes of eastbound and westbound SR-91. There is currently no direct connection between the SR-241 and the SR-91 Express Lanes.

The Proposed Project, located at the junction of SR-241 and SR-91 and in the cities of Anaheim, Yorba Linda and Corona and counties of Orange and Riverside, would provide improved access between SR-241 and SR-91 and is proposed to be a tolled facility. The proposed median-to-median connector project encompasses 12-ORA-241 (Post Mile [PM] 36.1/39.1), 12-ORA-91 (PM 14.7/18.9), and 08 RIV-91 (PM 0.0/1.5) for a length of approximately 8.7 miles (mi). The Project Location and Project Vicinity are shown in Figure 1.

Improvements for the connector are limited to 5.9 mi in the cities of Anaheim and Yorba Linda from south of the Windy Ridge Wildlife Undercrossing on SR-241 to Coal Canyon Undercrossing on SR-91. The remaining 2.8 mi of the Proposed Project is limited to FasTrak signage improvements (advance signage) in the Cities of Anaheim (1.2 mi total), Yorba Linda (0.1 mi) and Corona (1.5 mi), with exact placement pending the Final Design process. The Proposed Project is mostly within existing Caltrans right-of-way, with one partial acquisition adjacent to eastbound SR-91. Construction access and staging areas would occur within existing Caltrans right-of-way.

The proposed median-to-median connector is a later phase of the Eastern Transportation Corridor (ETC) project, previously approved in 1994. It was originally evaluated as a SR-241/SR-91 high-occupancy vehicle (HOV) direct connector in the 1991 ETC Draft Environmental Impact Report/ Environmental Impact Statement (Draft EIR/EIS), 1992 ETC Final EIR, and the 1994 ETC Final EIS (all of which studied a broader project area with improvements on SR-133, SR-241, and SR-261).

The Systems Management Concept (SMC) for the ETC projected that each Build Alternative would be staged, incorporating general purpose traffic and eventually HOV lanes, to meet the forecasted demand. Under the SMC, ETC construction would be completed in one stage, with three or more phases.

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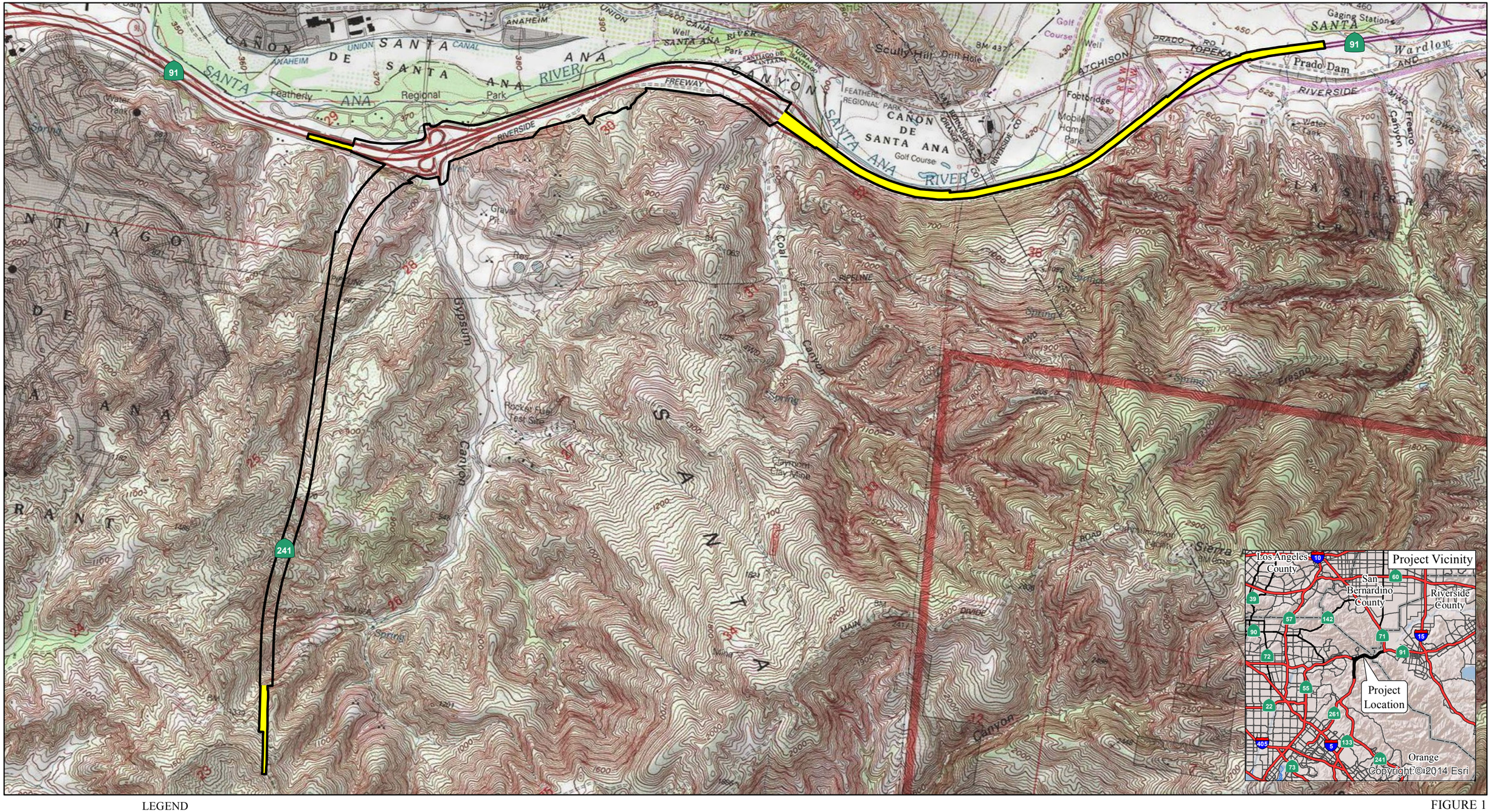

LEGEND

- Project Location
- Advance Signage Areas

FIGURE 1

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SOURCE: USGS 7.5' Quad - Black Star Canyon (1988), CA

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SR-241/SR-91 Express Lanes Connector

Project Location

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To implement this later phase of the ETC, a Supplemental Draft EIR/EIS is being prepared to focus on the eastern portion of the original project and to address changes to environmental conditions and regulatory requirements. Various alternatives were studied in the 1991 ETC Draft EIR/EIS, 1992 ETC Final EIR, and the 1994 ETC Final EIS; however, the Supplemental Draft EIR/EIS will include a No Build and only one Build Alternative for the median-to-median connector for the following reasons:

- There are limited locations for a median-to-median connector between SR-241 and SR-91;
- The median-to-median connector is a component of a previously approved project and alternative selected during a 1992 EIR Certification and 1994 Record of Decision (ROD);
- Various alternatives were studied for the previously approved project which required consideration of a reasonable range of alternatives; and
- The Supplemental Draft EIR/EIS is being prepared to address changes to environmental conditions and regulatory requirements and not to change the previously approved project as a whole.

The Proposed Project is being coordinated with the Orange County Transportation Authority (OCTA) and the Riverside County Transportation Commission (RCTC). The SR-91 Express Lanes are tolled and are operated by OCTA, from SR-55 to the Orange County/Riverside County line. Easterly from the county line, the lanes are HOV non-tolled lanes; however, as part of the RCTC SR-91 Corridor Improvement Project (SR-91 CIP), RCTC will operate median tolled lanes starting from the County line and ending at Interstate 15 (I-15). As part of the SR-91 CIP, the median tolled lanes include a connector to southbound I-15 general purpose lanes. Implementation of the SR-91 CIP along with the Proposed Project would provide a direct connection between SR-241 and southbound I-15.

Caltrans and the F/ETCA intend to begin construction of the Proposed Project in 2017.

1.2. Need and Purpose

1.2.1. Need

The project is needed to improve access between the SR-241 and SR-91 Express Lanes. The lack of connectivity between SR-241 and the SR-91 Express Lanes negatively affects traffic flow, worsens an already congested SR-91 during peak hours, and results in a long queue of vehicles on northbound SR-241 trying to access eastbound SR-91. As a result, motorists inappropriately "queue jump" (i.e., change lanes at the last minute) during congested traffic periods, contributing to delays.

1.2.2. Purpose

As stated in the Final EIR and Final EIS, the overall objective of the ETC was to accommodate traffic growth associated with planned and approved development in the County of Orange. Specifically, the ETC was proposed to meet the following objectives, which are applicable to the Proposed Project (which is a later phase of the ETC):

- To provide relief for existing freeways;

- To improve traffic flow on the regional transportation system;
- To service existing and planned development consistent with the General Plans of the counties and the cities in areas that will benefit from the project;
- To employ advanced transportation technology for the maximum operational and design efficiency and automatic vehicle monitoring for toll collections; and
- To implement the County of Orange Master Plan of Arterial Highways.

In addition to the originally intended objectives, changed circumstances at the junction of SR-241 and SR-91 have led to the following updated objectives for the Proposed Project:

- Implement the buildout of the ETC, as approved in 1994;
- Attain compatibility with the SR-91 mainline and Express Lanes;
- To improve traffic flow by minimizing queue-jumping on northbound SR-241 at the westbound SR-91 general purpose lane connector and at the eastbound SR-91 general purpose lane connector;
- To help achieve the Regional Mobility Plan goals of reducing emissions from transportation sources by improving movement in congested areas along the SR-241 and SR-91; and
- To enhance the efficiency of the tolled system, thereby reducing congestion on the non-tolled system on the SR-91.

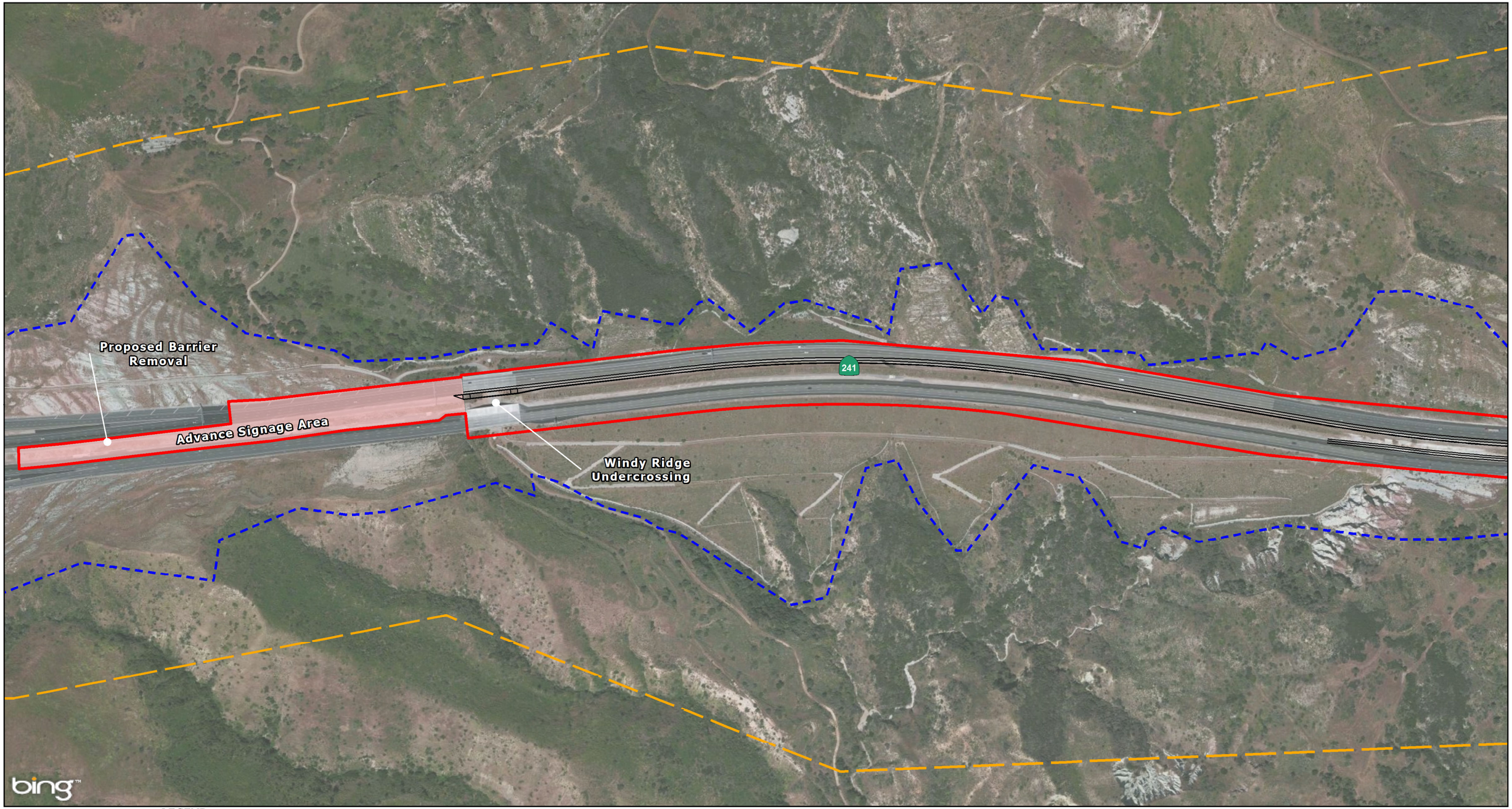
1.3. Project Alternatives

Two alternatives are being analyzed in this document: the Build Alternative and the No Build Alternative.

1.3.1. Build Alternative (Two-Lane Express Lanes Connector)

The Build Alternative would construct a two-lane express lane median-to-median connector between SR-241 and SR-91, which would connect lanes from the median of northbound SR-241 to the existing eastbound SR-91 Express Lanes. The reverse movement would also be accommodated, from the westbound SR-91 Express Lanes to the median of southbound SR-241. The connector would be tolled. The Build Alternative is shown in Figure 2.

On SR-241 at the southern end of the project (near PM 36), FasTrak signage would be improved approximately 0.2 mi south of the Windy Ridge Wildlife Undercrossing. For southbound SR-241, an additional lane and shoulder would be provided by widening the Windy Ridge Wildlife Undercrossing into the existing median and improving the highway median approximately 10,000 ft to the north. For northbound SR-241, starting approximately 5,000 ft north of the Windy Ridge Wildlife Undercrossing, an additional lane and shoulder will be provided by improving the highway median approximately 5,000 ft to the north. At this point on SR-241



LEGEND

- Project Area (Physical Improvements)
- Advance Signage Areas
- ETC EIR/EIS Project Area
- Existing Caltrans Right-of-Way
- Proposed Right-of-Way
- Proposed Lanes, Centerlines, and Ramps
- Proposed Grading Limits (Slope and Access Road)
- Proposed Bridge Structure
- Proposed Retaining Wall
- Proposed Construction Access
- Proposed Construction Staging Area
- Proposed Biofiltration Swale
- Proposed Media Filter
- Proposed Storm Drain Pipe
- Proposed Storm Drain Swale
- Proposed Storm Drain Structure

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SOURCE: Bing (2012); RBF (1/2015)

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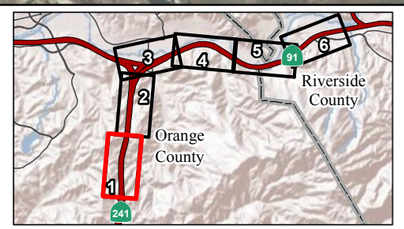

FIGURE 2
Sheet 1 of 6

SR-241/SR-91 Express Lanes Connector

Build Alternative

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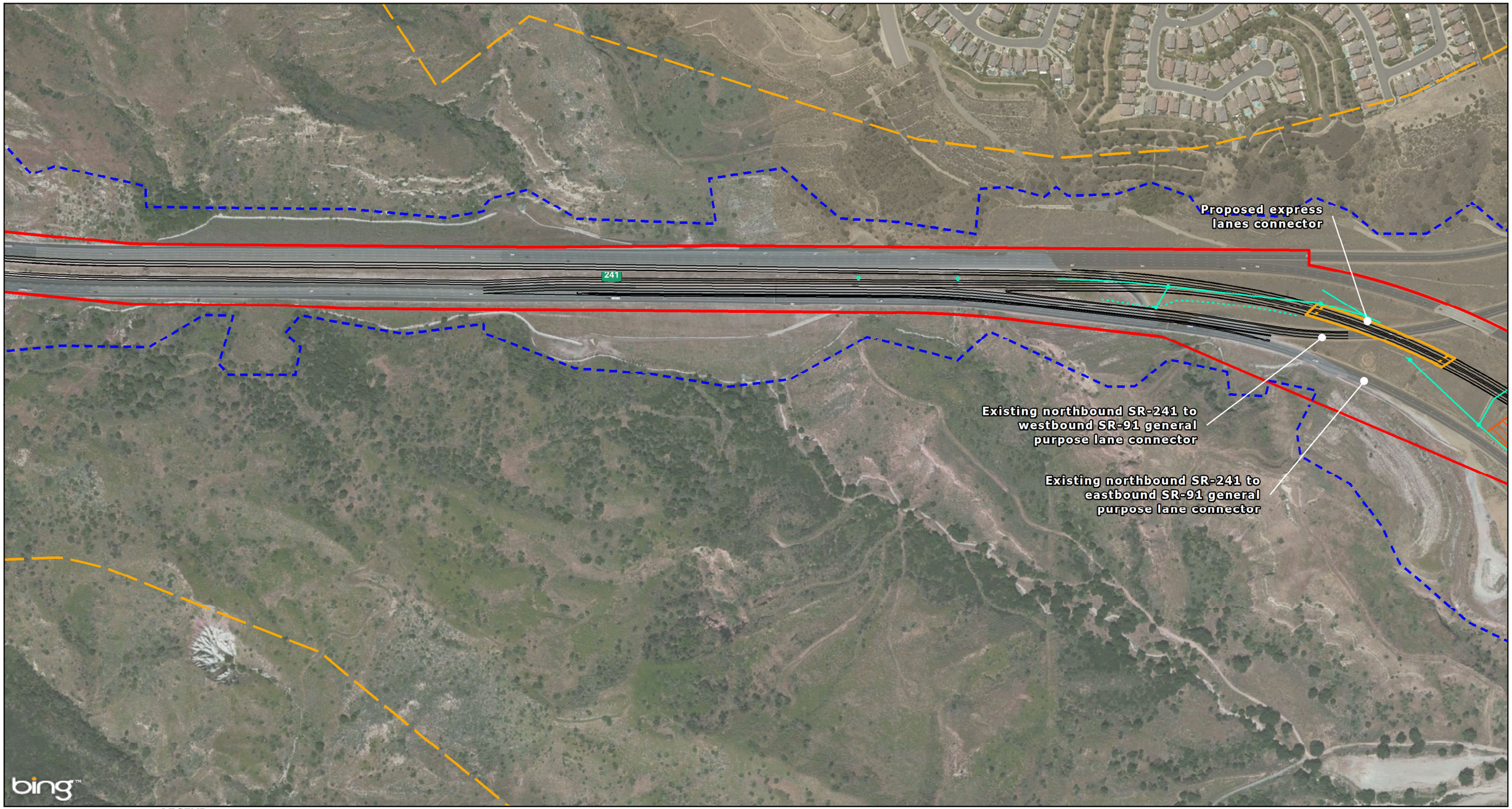

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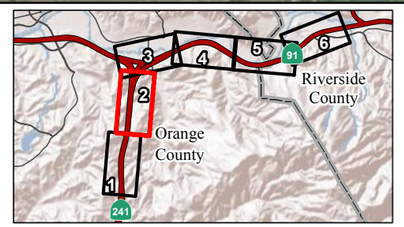

FIGURE 2
Sheet 2 of 6

SR-241/SR-91 Express Lanes Connector
Build Alternative

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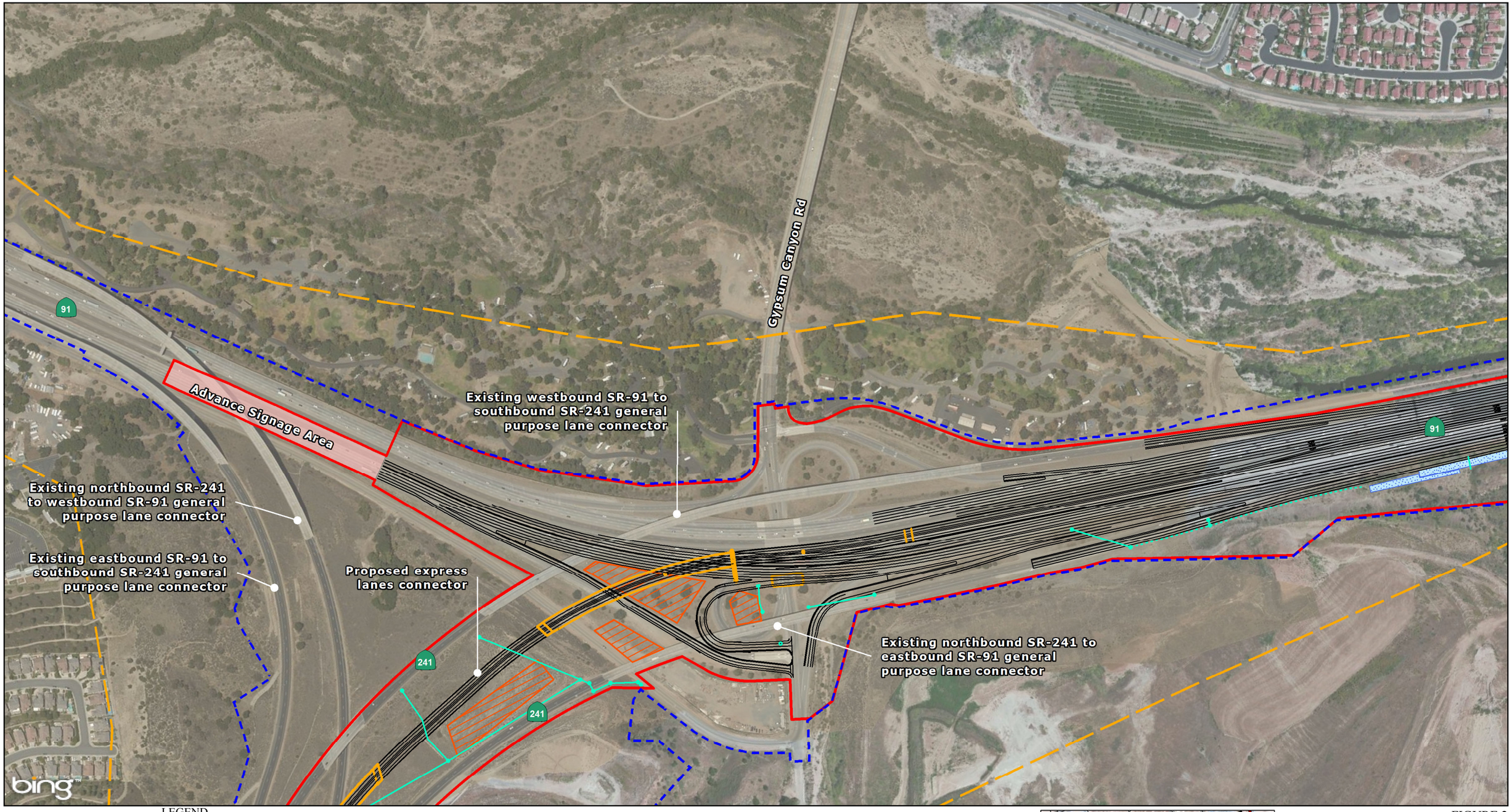

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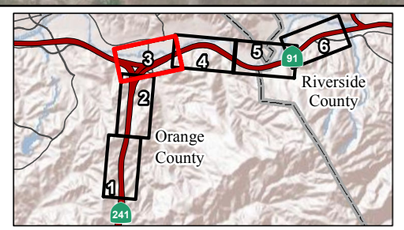

FIGURE 2
Sheet 3 of 6

SR-241/SR-91 Express Lanes Connector

Build Alternative

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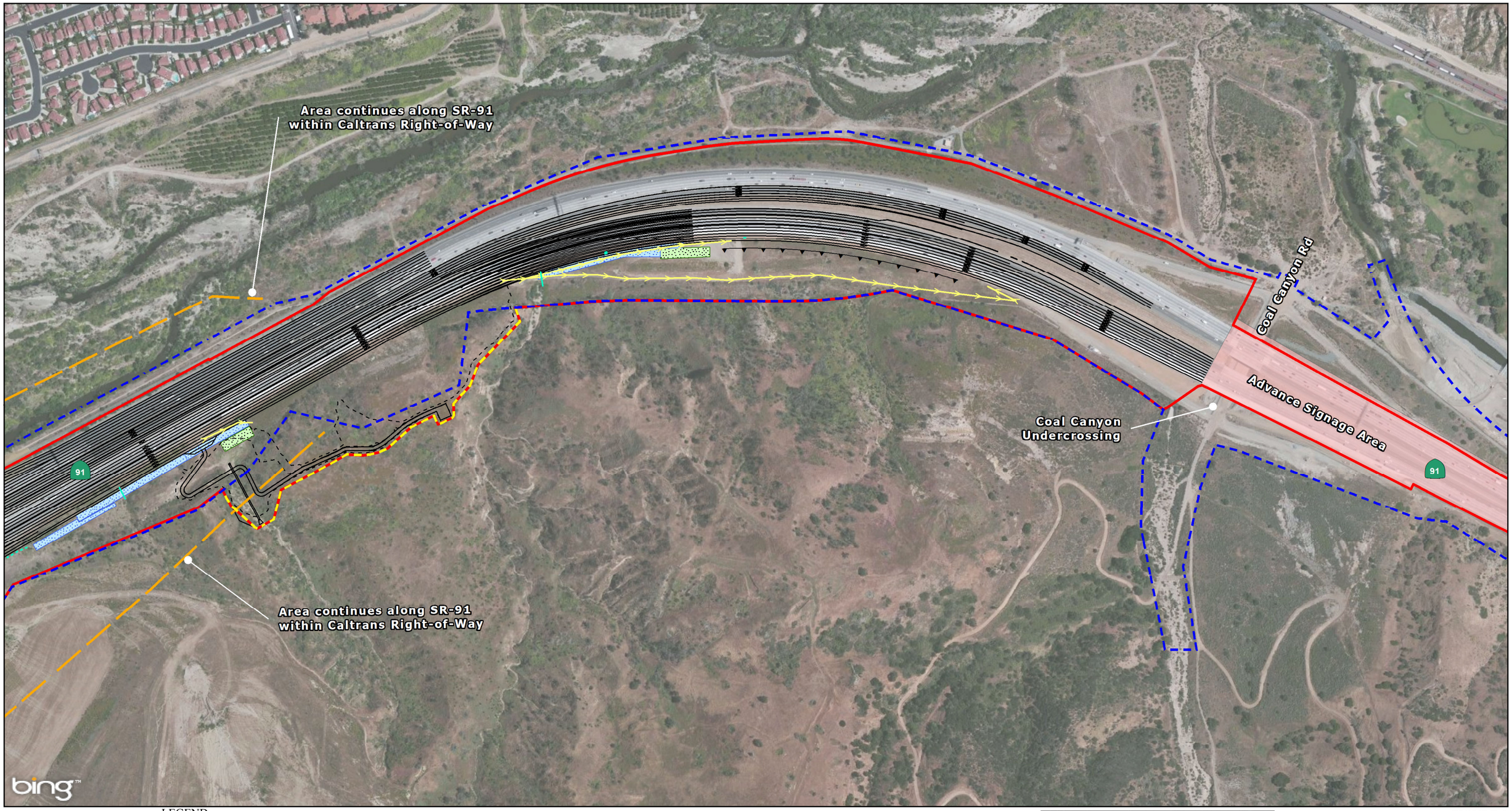

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- Proposed Storm Drain Structure

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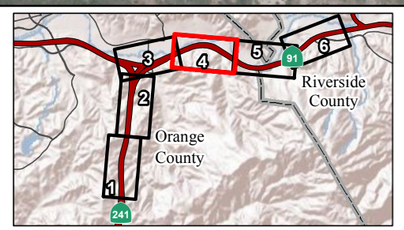

FIGURE 2
Sheet 4 of 6

SR-241/SR-91 Express Lanes Connector

Build Alternative

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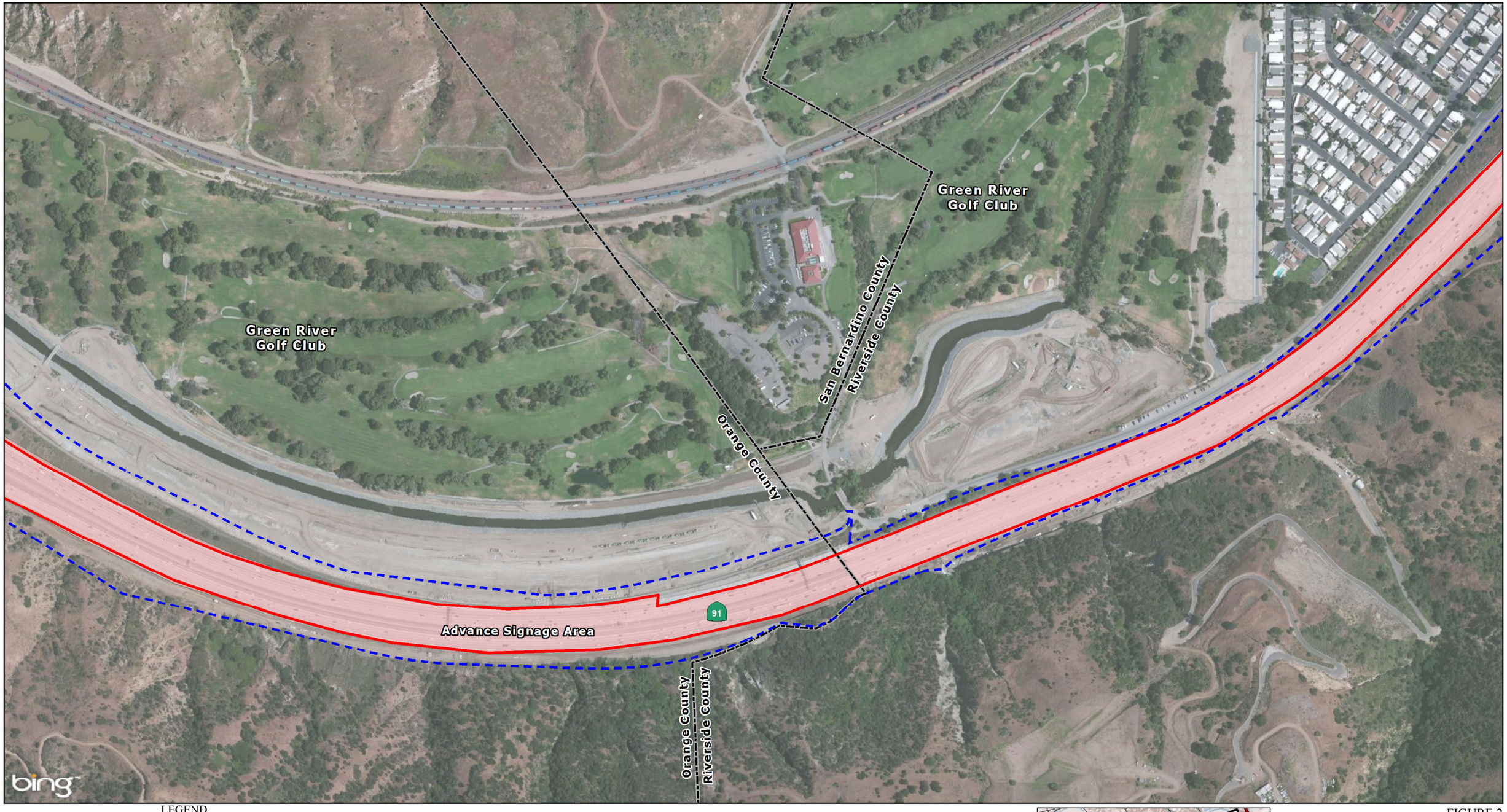

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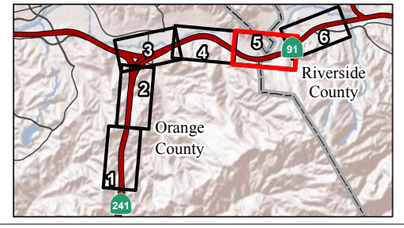

FIGURE 2
Sheet 5 of 6

SR-241/SR-91 Express Lanes Connector

Build Alternative

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LEGEND

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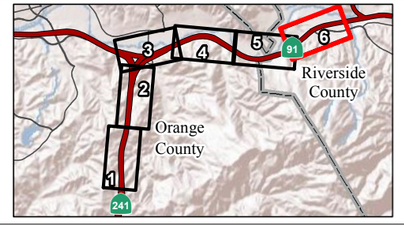

FIGURE 2
Sheet 6 of 6

SR-241/SR-91 Express Lanes Connector

Build Alternative

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fill and two new bridge structures approximately 700 ft (over the northbound SR-241 to westbound SR-91 general purpose lane connector) and 2,000 ft in length (to merge with SR-91). All approximate lengths will be further refined during the Final Design process.

Additional pavement would be added between the existing northbound SR-241/eastbound SR-91 and the northbound SR-241/westbound SR-91 general purpose connectors in order to accommodate a concrete barrier separation to prevent vehicles traveling on the westbound SR-91 general purpose connector to "queue jump" into the eastbound SR-91 general purpose connector. This would improve traffic flow on the SR-241.

The Build Alternative would merge into the existing OCTA SR-91 Express Lanes at the western limits of the RCTC SR-91 CIP, which extends the SR-91 Express Lanes further east to I-15. The Build Alternative is also compatible with the approved SR-91 CIP for both the initial and ultimate configurations, including the number and widths of the SR-91 Express Lanes, express auxiliary lanes, and general purpose lanes.

1.3.1.1. Improvements on Eastbound SR-91

At the western end of SR-91 project terminus, FasTrak signage improvements would occur approximately within the first 0.1 mi of the project. The Gypsum Canyon Road on- and off-ramps and the northbound-SR-241-to-eastbound-SR-91 general purpose connector would be realigned to accommodate the Proposed Project.

To accommodate the addition of the median-to-median connector, the existing eastbound SR-91 lanes would be shifted to the south by adding pavement to the south and restriping. The number of existing eastbound SR-91 general purpose lanes would be maintained within the project limits. At the eastern terminus of the connector bridge structure, the eastbound connector lane would continue for approximately 1 mi within the SR-91 median prior to tapering to tie in to the SR-91 CIP Express Lanes at Coal Canyon Undercrossing. Also near the eastern terminus of the connector lane bridge structure (approximately 2,000 ft west of Gypsum Canyon Road), one additional SR-91 CIP also at Coal Canyon Undercrossing.

These improvements would provide a four-lane express lane facility and tapering down to three lanes, between the connector and Coal Canyon Undercrossing.

The eastbound SR-91 Express Lanes would also have striped buffers (tapering from 0 ft to 4 ft). The Proposed Project would provide a striped buffer to separate the general purpose lanes from the SR-91 Express Lanes and a new striped buffer to temporarily separate the connector lane from the SR-91 Express Lanes. Additional separators within the striped buffers will be further considered during the Final Design process.

Approximately 3,600 ft west of Coal Canyon Undercrossing, grading would occur to accommodate the shift of the lanes to the south. The grading and construction of an access road would encroach into County-owned land on Assessor's Parcel Number (APN) 085-071-56. Approximately 5 acres (ac) of land on this parcel would be acquired from the County of Orange for Caltrans right-of-way. To the north of this parcel, a 1,000 ft retaining wall would be required, but would not be viewable from the highway. Further details for the retaining wall and the exact length will be determined during the Final Design process.

1.3.1.2. Improvements on Westbound SR-91

At the eastern terminus of the connector bridge structure, the westbound connector lane would extend for approximately 1 mi within the SR-91 median, with the lane tapering approximately 1,000 ft west of Coal Canyon Undercrossing. For the eastern 1,000 ft of the westbound connector express lane, one additional westbound auxiliary express lane would be provided to accommodate merging and diverging to and from the SR-91 Express Lanes. These improvements would provide a four-lane express lane facility for approximately 1,000 ft. To provide the additional SR-91 Express Lanes, restriping would occur between points east of the Gypsum Canyon Road Undercrossing and west of Coal Canyon Undercrossing.

There would be a striped buffer (tapering from 0 ft to 2 ft) to separate the westbound SR-91 Express Lanes from the general purpose lanes. Additional separators within the striped buffer will be further considered during the Final Design process. At the eastern end of SR-91 project terminus, FasTrak signage improvements would occur between Coal Canyon Undercrossing and Green River Road within the existing median and highway footprint of westbound SR-91. (No roadway improvements would occur in this area.)

1.3.2. No Build Alternative

Under this alternative, no direct toll connector would be constructed between SR-241 and SR-91. The No Build Alternative:

- Would not close the toll connector gap between SR-241 and the SR-91 Express Lanes.
- Would not prevent motorists from inappropriately "queue jumping" during congested traffic periods, thereby disrupting traffic flow on the northbound SR-241 connector to the eastbound SR-91 general purpose lanes during PM Peak hours.
- Would provide a benchmark by which the public and decision-makers can compare the magnitude of the effects of the Build Alternative.

1.3.3. Proposed Storm Water Features Associated with the Build Alternative

The Build Alternative would result in a permanent net increase in impervious surface area of approximately 20.5 ac. There would be no increase in impervious surface under the No Build Alternative. The Build Alternative would not include any additional cut/fill slopes greater than 2H: 1V; all slopes would be 2H: 1V or flatter. Runoff from the new impervious area would be managed using design features that provide biofiltration to address pollutants of concern and flow duration control to address potential hydromodification impacts. The proposed preliminary design features include biofiltration swales and strips and media filters in multiple locations throughout the Build Alternative's limits (Figure 2).

During construction activities, the total disturbed area would be approximately 43.9 ac. For the construction phase of the Build Alternative, the contractor would be required to develop a Stormwater Pollution Prevention Plan (SWPPP), Risk Level 2, in accordance with the California Statewide Construction General Permit (Construction General Permit) Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ, National Pollutant Discharge Elimination System (NPDES) No. CAS000002 and the Caltrans Statewide NPDES Storm Water Permit, Order No.

2012-0011-DWQ, No. CAS000003. The requirements of the Construction General Permit are based on the risk level of the project. Based on the Risk Determination methodology outlined in the Construction General Permit, the project's sediment risk is high and its receiving water risk is low, resulting in a combined Risk Level 2 (medium risk).[1]

The existing surface drainage/storm drain system along the proposed project alignment consists of earthen swales and drop inlets that convey runoff to cross culverts, ditches, and trapezoidal channels. The culverts, ditches, and channels drain surface storm water into the Santa Ana River and, eventually, the Pacific Ocean. Although the widened pavements along both SR-241 and SR-91 would increase the amount of storm water runoff, most of the additional runoff would be managed by the existing on-site drainage systems. However, modifications and improvements would be required to accommodate the additional flow. There are significant differences between the on-site drainage systems of SR-241 and SR-91.

Widening SR-241 within the existing median would increase the total amount of storm water runoff. Currently, existing drop inlets at various locations collect runoff with the earthen swales and convey the runoff to existing cross culverts. However, widening on SR-241 would occur within the median and would require the reconstruction of earthen swales and existing drop inlets, and portions of existing culverts would be removed. New drop inlets with connecting pipes would be constructed along the reconstructed earthen swales. The runoff collected in the new drop inlets would be conveyed to the existing cross culverts at their original locations. In addition, portions of the existing ditches and trapezoidal channels would be reconstructed to maintain existing flow patterns. Runoff that flows toward the outside shoulders of the roadbed would be picked up by modified existing drop inlets and pipes along the outside shoulders of the roadbed, which would convey the flows to existing cross culverts at their original locations. The existing edge drains would be removed and replaced and their locations would be specifically identified during the project's final design phase.

The Proposed Project consists of a roadbed connecting SR-241 to SR-91 on new embankments and two new structures. Within the embankment areas, new guard railing with dikes would be constructed to contain the runoff. New pipe systems and new drop inlets would be constructed along the median barrier and outside shoulders of the Proposed Project. Drainage systems along the new structures would consist of deck drain systems that collect and convey runoff to the new columns as per Caltrans Standard Plans.

Widening SR-91 will increase the total amount of storm water runoff. The increase in runoff would require additional median drainage systems and existing drop inlets and median culverts would be removed or abandoned. New "double" grate inlets and pipe systems would be constructed along the median barrier to collect elevated runoff. The new median drainage systems would convey flows to the existing cross culverts. Runoff flows toward the outside edge of the pavement would be captured by new "double" grate inlets with parallel pipe systems and new dikes, and would drain into existing cross culverts at their original locations. Existing drop inlets and culverts that are no longer needed would be removed or abandoned. New drop inlets and parallel pipe systems would be constructed at the edge of the pavement adjacent to the new

[1] RBF Consulting, Inc. 2014. *Storm Water Data Report.*

retaining walls. Along the stretch of eastbound SR-91, a 60-inch reinforced concrete pipe would require extension to the south. In addition, Treatment Best Management Practices (BMPs) would be constructed along a portion of the eastbound widening. Portions of the existing ditches would be reconstructed to maintain existing flow patterns.

Reconstruction of the ramps and connectors would not substantially increase the amount of runoff; however, new drop inlets and pipe systems would be constructed at appropriate locations and connect to existing drainage systems.

The proposed surface drainage system would be linked to the existing drainage system and would preserve the existing drainage pattern as much as possible, including draining all storm water to the Santa Ana River and then to the Pacific Ocean, which is consistent with current conditions.

1.4. Approach to Water Quality Assessment

The purpose of the Water Quality Assessment Report (WQAR) is to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information, to the extent possible, for NPDES permitting. The document includes a discussion of the proposed project, the physical setting of the project area, and the regulatory framework with respect to water quality; it also provides data on surface water and groundwater resources within the project area and the water quality of these waters, describes water quality impairments and beneficial uses, and identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

This WQAR determines whether the construction and operation of the Proposed Project would have an adverse impact on water quality. The determination of impacts is based on the anticipated change in pollutant loads due to changes in land use and change in impervious area between the existing condition and the post project condition. The analysis includes consideration of BMPs to be implemented as part of the proposed project. This assessment also discusses existing water quality regulations and methods of complying with those regulations. The report format is based on the Caltrans Water Quality Assessment Content and Recommended Format (June 2012).

2. Regulatory Setting

2.1. Federal Laws and Requirements

2.1.1. Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with a NPDES permit. Known today as the Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity, which may result in a discharge to waters of the U.S., to obtain certification from the State that the discharge will comply with other provisions of the act. (Most frequently required in tandem with a Section 404 permit request. See below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and Municipal Separate Storm Sewer Systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

USACE issues two types of 404 permits: Standard and General permits. For General permits, there are two types: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are also two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (EPA) Section 404 (b)(1) Guidelines (U.S. EPA CFR 40 Part 230), and whether permit approval is in the public interest. The 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative that would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable

alternative (LEDPA), to the proposed discharge that would have less effects on waters of the U.S., and not have any other significant adverse environmental consequences. Per Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures have been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4.

2.2. State Laws and Requirements

2.2.1. Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the State. It predates the CWA and regulates discharges to waters of the State. Waters of the State include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-source point controls (NPDES permits or Waste Discharge Requirements), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

2.2.1.1. State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB adjudicates water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **National Pollution Discharge Elimination System (NPDES) Program**

  Municipal Separate Storm Sewer Systems (MS4)

  Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water dischargers, including MS4s. The U.S. EPA defines an MS4 as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water." The SWRCB has identified Caltrans as an owner/operator of an MS4 pursuant to federal regulations. The Caltrans' MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

  Caltrans' MS4 Permit (Order No. 2012-0011-DWQ) was adopted on September 19, 2012 and became effective on July 1, 2013. The permit has three basic requirements:

  1. Caltrans must comply with the requirements of the Construction General Permit (see below);
  2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
  3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs) to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

  To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

  Construction General Permit

  Construction General Permit (Order No. 2009-009-DWQ, as amended by 2010-0014-DWG), adopted on November 16, 2010, became effective on February 14, 2011. The permit regulates storm water discharges from construction sites which result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. For all projects subject to the Construction General Permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan

(SWPPP). In accordance with Caltrans' Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre must comply with the provisions of the Construction General Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.3. Regional and Local Requirements

2.3.1. General Waste Discharge Requirements for De Minimus Discharges

On March 27, 2009, the Santa Ana RWQCB adopted the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality (Order No. R8-2009-0003, NPDES No. CAG998001). This permit covers discharge of groundwater and non-storm water construction dewatering waste in the Santa Ana Region. Under this permit, discharges must comply with discharge specifications, receiving water limitations, and monitoring and reporting requirements detailed in the permit.

2.3.2. Eastern Transportation Corridor 1992 Final Environmental Impact Report and 1994 Final Environmental Statement

As mentioned in Section 1.1, Project Description, the Proposed Project is a later phase of the ETC project that included a broader project area and improvements on SR-133, SR-241, and SR-261. Mitigation measures outlined in the ETC Final EIR and Final EIS included the federal, State, and local requirements and regulations at that time. The requirements and regulations from 1992 and 1994 have been updated and many of the mitigation measures outlined in the ETC Final EIR and Final EIS are, therefore, outdated and have been superseded by measures in Section 5, Avoidance and Minimization Measures, of this WQAR. However, several mitigation measures from the ETC Final EIR and Final EIS included requirements that are still applicable to the Proposed Project. The applicable mitigation measures are included in Section 3.8, Water Quality and Storm Runoff, of the Supplemental Draft EIR/EIS.

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3. Affected Environment

3.1. Introduction

The project area lies within the northeastern portion of the City of Anaheim and the southeastern portion of the City of Yorba Linda in Orange County, within the Santa Ana River Watershed (Figure 3).

3.2. General Setting

3.2.1. Population and Land Use

A variety of land uses exist adjacent to the project area, including transportation, residential, infrastructure, recreational, and undeveloped/open space. Featherly Regional Park, the Santa Ana River, and the Santa Ana River Trail border the north side of SR-91. To the immediate south of SR-91 and west of SR-241, the area is predominately bordered by residential properties. To the east of SR-241 and south of SR-91, the area consists of undeveloped areas. Farther south of SR-91 and east and west of SR-241, the area is undeveloped open space.[1]

According to the United States Census Bureau, in 2013 the population of Orange County was 3,121,854 persons. The 2013 populations of the Cities of Anaheim and Yorba Linda were 345,012 and 67,032, respectively.[2]

3.2.2. Topography

Elevations range from approximately 370 ft above mean sea level (amsl) to 1,570 ft amsl.[3] The topography is moderately rolling adjacent to SR-91, with steep canyons and hillsides along the Santa Ana Mountains, which border the southernmost portion of the project area. Canyons and tributary washes associated with the Santa Ana River also occur throughout the project area.[4]

3.2.3. Hydrology

3.2.3.1. Regional Hydrology

The proposed project is located within the Santa Ana Region, which covers approximately 2,800 square miles in Southern California. The Santa Ana River Basin makes up most of the Santa Ana Region. The Santa Ana Region is too large and complex to be managed as a single watershed. Therefore, for the purpose of watershed planning, the Santa Ana Region has been divided into 10 Watershed Management Areas (WMAs). The project area is within the Lower Santa Ana River WMA, which expands from the Prado Dam to the Pacific Coast but

1 LSA Associates, Inc. 2015. *SR-241/91 Express Lanes Connector Project Natural Environment Study.*
2 United States Census Bureau. *Quick Facts.* Last accessed April 23, 2015, from http://www.census.gov/quickfacts/table/PST045214/00.
3 LSA Associates, Inc. 2015. *SR-241/91 Express Lanes Connector Project Natural Environment Study.*
4 United States Geological Survey (USGS). 1988. *7.5-Minute Quadrangle, Black Star Canyon, California.*

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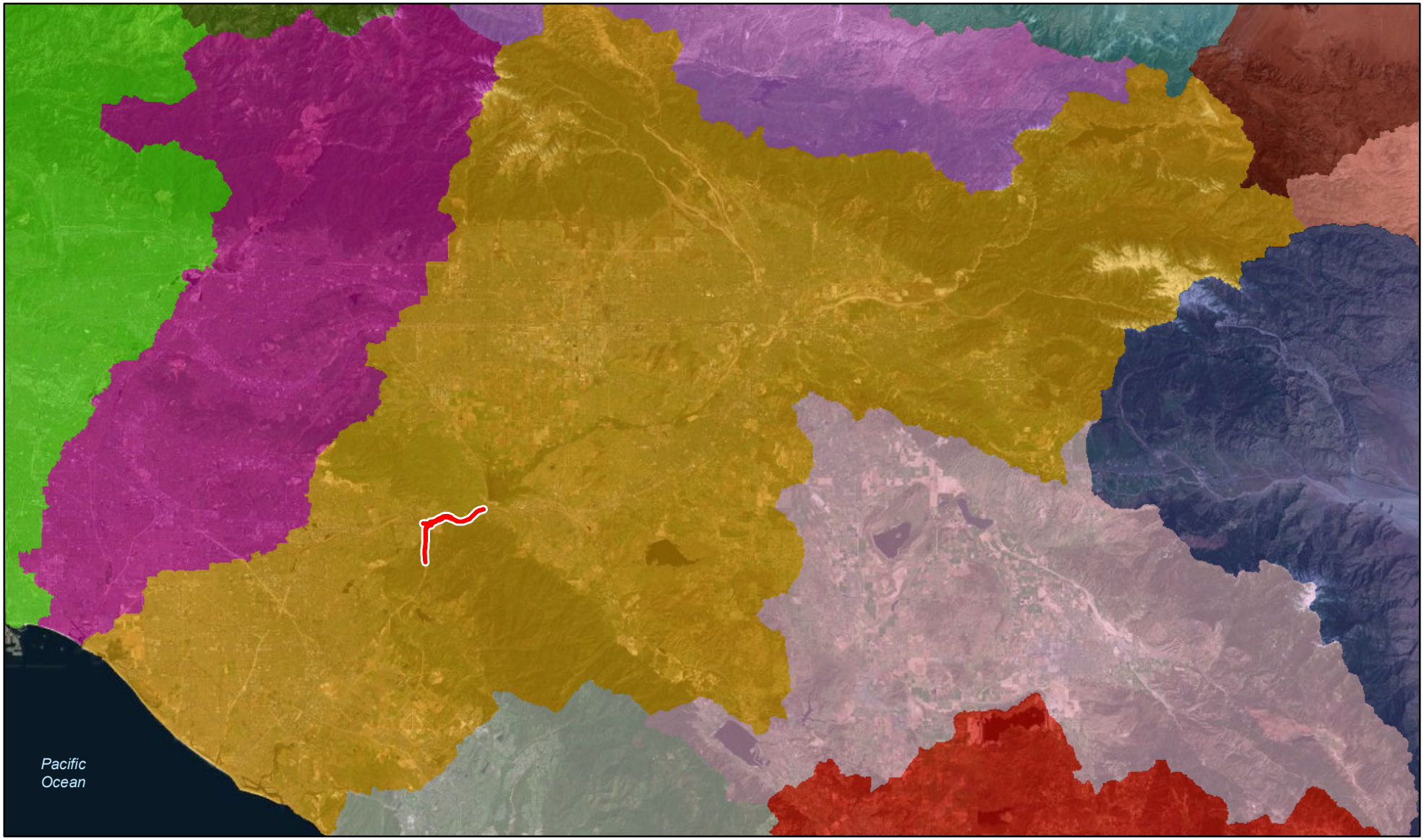

FIGURE 3

LEGEND

Project Location

Watershed Boundary

- Antelope
- Emerson
- Johnson
- Los Angeles River
- Lucerne Lake
- Mojave
- San Gabriel River
- San Jacinto Valley
- San Juan
- San Luis Rey
- Santa Ana River
- Santa Margarita
- Whitewater

N

0 5 10
Miles

Source: Eagle Aerial (05/25/2010);USGS NHD (2012); CalWater (v 2.2.1)

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SR-241/SR-91 Express Lanes Connector

Santa Ana River Watershed Boundary

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excludes the Newport Bay Watershed and the Anaheim Bay, Huntington Harbor, and Bolsa Chica WMAs. The cities in the Lower Santa Ana River WMA include all or portions of Yorba Linda and Anaheim Hills, Orange, Villa Park, Anaheim, Garden Grove, Santa Ana, Fountain Valley, Huntington Beach, and Costa Mesa.[1] The Santa Ana River is within the Santa Ana Region and is a major drainage route for Southern California; the river originates in the San Bernardino Mountains and extends southwest into the Pacific Ocean in the vicinity of Newport Beach.[2]

For regulatory purposes, the Santa Ana RWQCB designates watershed areas in Hydrologic Units (HU) which are further divided into Hydrological Areas (HA) and Hydrologic Subareas (HSA). As designated by the Santa Ana Region 8, the project area is located within the Santa Ana River HU, the Lower Santa Ana River HA, the Santa Ana Narrows HSA, and the Santiago HSA[3] (Figure 4).

3.2.3.2. Local Hydrology

Storm water runoff from the project is discharged directly into the Santa Ana River, Reach 2, and, ultimately, the Pacific Ocean.[4]

3.2.3.2.1. Precipitation and Climate

The climate is classified as Mediterranean—generally dry in the summer with mild, wet winters. Annual average precipitation in the Santa Ana River Basin ranges from 12 inches per year in the coastal plain to 18 inches per year in the inland alluvial valleys, and 40 inches per year in the San Bernardino Mountains. Most of the precipitation occurs between November and March. Consequently, under natural conditions, the Santa Ana River would be intermittent with little or no flow in the summer months.[5]

3.2.3.2.2. Surface Streams

SR-91 runs parallel to the Santa Ana River. Drainage from the project area flows to the Santa Ana River, Reach 2, and, ultimately, the Pacific Ocean. In addition, Coal Creek and Gypsum Creek are located east of the project area, originating in the Santa Ana Mountains. Coal Creek is northeast of Gypsum Creek and flows towards the north end of the project area, near SR-91. Gypsum Creek is southwest of Coal Creek and flows parallel to SR-241, toward the SR-241/SR-91 interchange (Figure 5).

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1 Santa Ana Regional Water Quality Control Board. 2006. *Watershed Management Initiative.* Last accessed April 23, 2015, from http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/wmi/index.shtml.

2 CH2MHILL.2011. *Geologic Summary and General Earthwork Recommendations, State Route 241/91 Direct Connector Project, Orange County, California.*

3 California Regional Water Quality Control Board, Santa Ana Region. *Water Quality Control Plan, Santa Ana River Basin.* 1995. Updated February 2008 and June 2011.

4 RBF Consulting. 2014. *Storm Water Data Report.*

5 USGS. 2015. *California Water Science Center- Santa Ana Basin, National Water Quality Assessment Program.* Last accessed April 23, 2015, from http://ca.water.usgs.gov/sana_nawqa/env_set.html.

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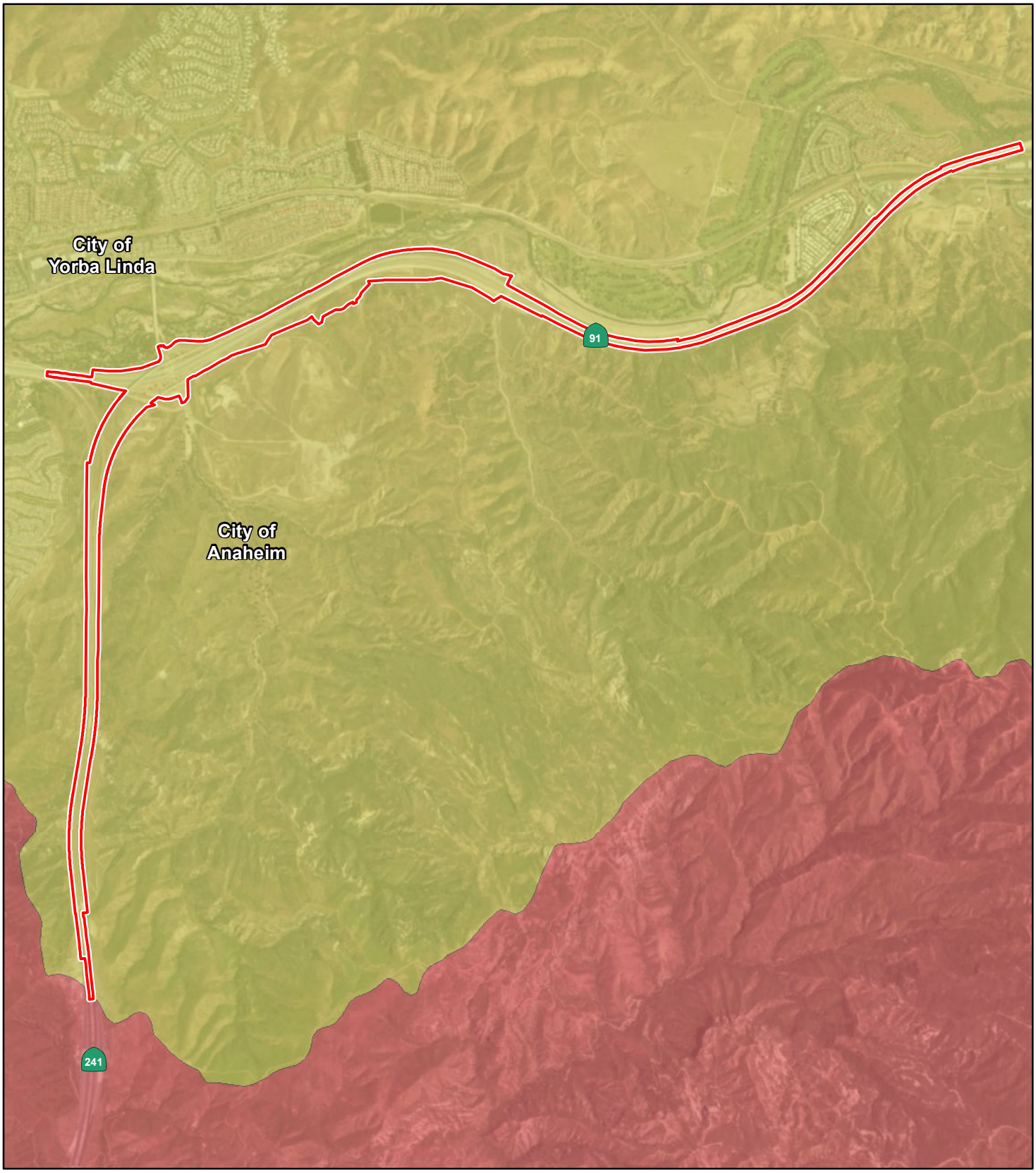

LEGEND

Project Location

Hydrologic Unit/Area/Sub-area

Santa Ana River/Lower Santa Ana River/Santiago

Santa Ana River/Lower Santa Ana River/Santa Ana Narrows

N

0 1500 3000

Feet

Source: Eagle Aerial (05/25/2010);USGS NHD (2012); CalWater (v 2.2.1)

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FIGURE 4

SR-241/SR-91 Express Lanes Connector

Hydrologic Unit, Hydrologic Area, and Subarea

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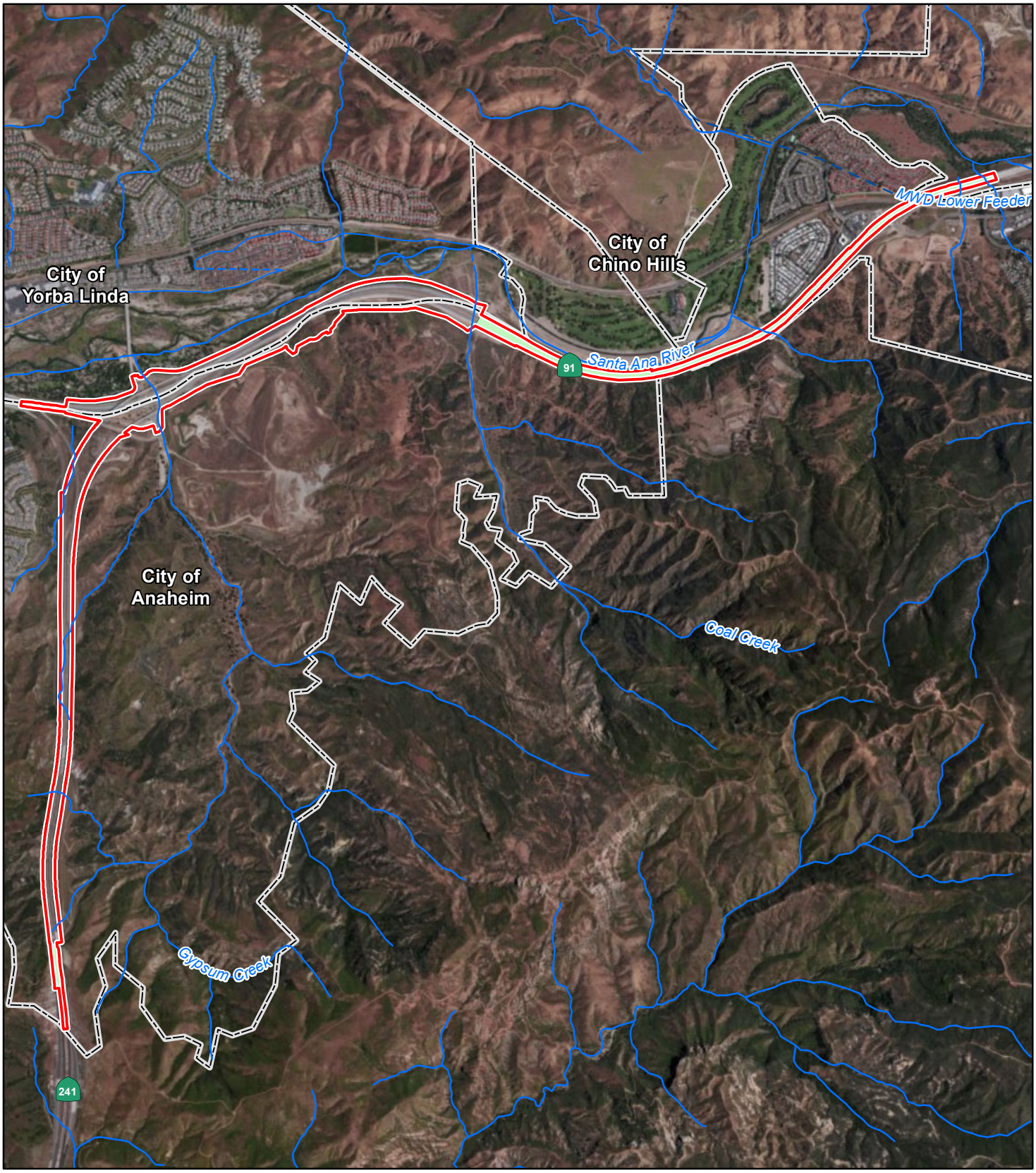

LEGEND

Surface Waters

City Boundary

FIGURE 5

N

0 1500 3000

Feet

SR-241/SR-91 Express Lanes Connector

Surface Waters

Source: Eagle Aerial (05/25/2010);USGS NHD (2012); CalWater (v 2.2.1)

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3.2.3.2.3. Floodplains

The project is adjacent to the Santa Ana River, which runs parallel to SR-91. The Santa Ana River, north of SR-91, is within the 100-year Flood Zone AE. Zone AE identifies a special flood hazard area for which Base Flood Elevations have been provided. However, no project improvements would occur within Zone AE.[1] A small portion of the project along SR-241 is within Flood Zone X. Areas within Zone X are moderate flood hazard areas, between the limits of the 100-year flood and the 500-year flood zone.[2] The project is not anticipated to encroach into the 100-year floodplain.

3.2.3.2.4. Municipal Supply

The City of Anaheim's water supply is a blend of groundwater from the wells in the local groundwater basin that underlies most of northern Orange County, and water imported from Northern California and the Colorado River by the Metropolitan Water District of Southern California (MWD).[3]

The City of Yorba Linda's water supply is a blend of local water from Yorba Linda Water District's 10 water wells that pump water from the large underground aquifer that underlies most of northern Orange County. The aquifer is carefully managed by the Orange County Water District (OCWD) and is replenished by water from the Santa Ana River, local rainfall, and surplus water purchased from imported sources. Approximately half of the water the City needs is pumped from these wells. The Yorba Linda Water District obtains the remainder of the water from local wholesaler Municipal Water District of Orange County (MWDOC). MWDOC obtains its water from regional supplier MWD.[4]

3.2.3.3. Groundwater Hydrology

A portion of the project area is within the Coastal Plain of Orange County Groundwater Basin (Orange County Basin) (Figure 6). The rest of the project area falls within an undefined area. The Orange County Basin underlies a coastal alluvial plain in the northwestern portion of Orange County. The basin is bounded by consolidated rocks exposed on the north in the Puente and Chino Hills, on the east in the Santa Ana Mountains, and on the south in the San Joaquin Hills. The basin is bounded by the Pacific Ocean on the southwest and by a low topographic divide approximated by the Orange/Los Angeles County line on the northwest. The basin underlies the lower Santa Ana River watershed.[5]

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1 RBF Consulting. 2014. *Location Hydraulic Study*.

2 Federal Emergency Management Agency. *Flood Insurance Rate Map No. 06059C0180J*. December 3, 2009.

3 Anaheim Public Utilities. 2014. *2014 Water Quality Report*. Last accessed April 23, 2015, from http://www.anaheim.net/utilities/waterservices/2014WQR.pdf.

4 Yorba Linda Water District. 2015. *Water Sources.* Last accessed April 23, 2015, from http://www.ylwd.com/your-water-service/water-quality/water-sources.

5 California Department of Water Resources. 2004. *Coastal Plain of Orange County Groundwater Basin.* Last accessed April 23, 2015, from http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/8-1.pdf.

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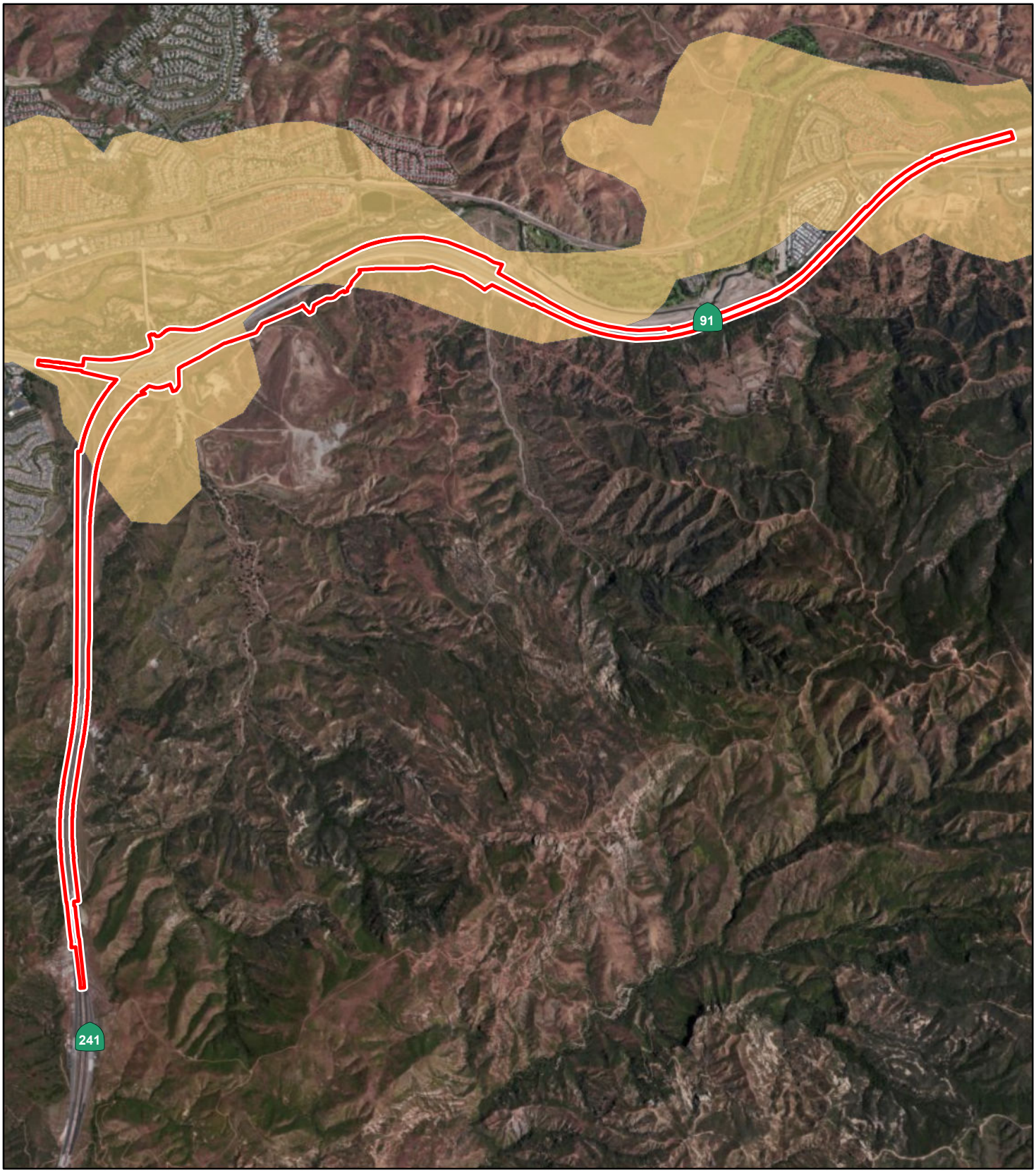

LEGEND

Project Location

Groundwater Basin - Coastal Plain of Orange County

FIGURE 6

N

0 1500 3000

Feet

Source: Eagle Aerial (05/25/2010);USGS NHD (2012); CalWater (v 2.2.1)

I:\RBF1101\GIS\GroundwaterBasin.mxd (4/29/2015)

SR-241/SR-91 Express Lanes Connector

Groundwater Basin

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Between the intersection of SR-91 with SR-241 and the County Line, the reported groundwater elevations range from approximately 359 ft to 411 ft. Between the County Line and Green River Road, the reported groundwater elevations range from 347 ft to approximately 399 ft. Groundwater elevations rise toward the SR-91/SR-71 Separation to a high elevation of 445 ft. Historical groundwater levels were recorded by the California Department of Water Resources (DWR) in its monitoring wells in the vicinity of this segment.[1] Historic high-groundwater levels in the vicinity of the junction of SR-241 and SR-91 and within Santa Ana Canyon along SR-91 have been mapped at 10 ft to 40 ft below ground surface (bgs).[2]

The proposed project area is located in a "high risk" area, defined as a location where spills from State-owned rights-of-way, activities, or facilities can discharge directly to municipal or domestic water supply reservoirs or groundwater percolation facilities. OCWD maintains a system of diversion structures and recharge basins along a 6 mi section of the Santa Ana River that capture most of the water that would otherwise flow into the Pacific Ocean. Runoff from SR-91 discharges directly into the Santa Ana River upstream of the OCWD Recharge Basins and is, therefore, considered a "high risk" area.[3]

3.2.4. Geology/Soils

3.2.4.1. Soil Erosion Potential

Locally, the project area is underlain by artificial fill placed in association with SR-241 and SR-91, sediments eroded from upland areas and transported and deposited by the Santa Ana River, competent landslide debris, and bedrock of various sedimentary formations.[4]

Most of the soil along the SR-91 segment consists of corralitos loamy sand, riverwash, and yorba cobbly sandy loam. Around the location of SR-241, the soil consists of mainly cienebarock outcrop complex, corralitos loamy sand, rock outcrop-cieneba complex, soper loam, soper gravelly loam and yorba cobbly sandy loam. The Orange County Hydrology Manual defines the various soil types within the project area in four broad categories based on those adopted by the National Resource Conservation Service (NRCS).[5] Group A soils have low runoff potential and high infiltration rates. Group B soils have moderate runoff potential and moderate infiltration rates. Group C soils have moderately high runoff potential and low infiltration rates. Group D soils have very low infiltration rates and high runoff potential.[6] Soil types for the project area are classified as A, C, and D.

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1 RBF Consulting. 2014. *Storm Water Data Report.*

2 CH2MHILL. 2011. *Geologic Summary and General Earthwork Recommendations, State Route 241/91 Direct Connector Project, Orange County, California.*

3 California Department of Transportation, *Stormwater Management Program, District 12 Work Plan, Fiscal Year 2015–2016.* October 1, 2014. Last accessed April 23, 2015, from http://www.dot.ca.gov/hq/env/stormwater/annual_report/distwkplan/2015-2016/d12_ar_pub_dwp.pdf.

4 CH2MHLL. 2011. *Geologic Summary and General Earthwork Recommendations, State Route 241/91 Direct Connector Project, Orange County, California.*

5 RBF Consulting. 2014. *Storm Water Data Report.*

6 United States Department of Agriculture. 2007. *Chapter 7 Hydrologic Soils.* Last accessed April 23, 2015, from http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx? content=17757.wba.

Groups C and D appear to be the most common along the SR-241 stretch. Along the SR-91 stretch, the project contains large pockets of Groups A and D.[1]

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water, transportability of the sediment, and the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.05 to 0.65. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. The soils found within the project area have a soil erosion factor K of 0.32, which indicates moderate susceptibility to particle detachment and moderate runoff rates.[2]

3.2.5. Biological Communities

3.2.5.1. Aquatic Habitat

Some of the drainage features within the project area are composed of a mixture of natural earthen bottoms and concrete or riprap-lined channels. All of these drainages have been altered in some form or are wholly human-made.[3] Aquatic resources are limited within the project area due to the impacted drainage features and limited water availability.

3.2.5.1.1. Special-Status Species

The results presented in the Natural Environment Study (NES) for the Proposed Project are based on literature searches and biological resource surveys conducted in 2011, 2013, 2014, and 2015. In 2011, 2013, 2014, and 2015, reconnaissance-level biological resource surveys, focused plant and wildlife surveys, and vegetation mapping were performed to document the existing conditions of biological resources in the Biological Study Area (BSA). The BSA included areas of undeveloped land within Caltrans right-of-way that are dominated by ruderal and ornamental vegetation. According to the NES, no aquatic or aquatic-dependent special-status plant species are known or expected to occur within the BSA. However, the BSA supports suitable habitat for a variety of special-status wildlife species. Suitable nesting habitat for Allen's hummingbird, Lawrence's goldfinch, and Cooper's hawk is present within the BSA. In addition, suitable roosting habitat for special-status bat species is present within the BSA. Special-status bat species, including western small-footed myotis and Yuma myotis, were observed at the Coal Canyon box culvert and the Gypsum Canyon box culvert within the BSA.[4]

1 RBF Consulting. 2014. *Storm Water Data Report.*
2 Ibid.
3 LSA Associates, Inc. 2015. *Jurisdictional Delineation.*
4 LSA Associates, Inc. 2015. *SR-241/SR-91 Express Lanes Connector Project Natural Environment Study.*

3.2.5.1.2. Stream/Riparian Habitats

Some of the drainage features within the project area are composed of a mixture of natural earthen bottoms and concrete or riprap-lined channels. All of these drainages have been altered in some form or are wholly human-made. Due to the impacted drainage features and limited water availability, it is unlikely that aquatic wildlife species would depend on the conveyance of water through the project area.

Wildlife movement and habitat fragmentation are greatly affected by roads. Several wildlife crossings were constructed into SR-241 to allow for wildlife movement, including the Windy Ridge Wildlife Undercrossing in the southern part of the BSA. The Windy Ridge Wildlife Undercrossing beneath SR-241 at the southern section of the BSA allows wildlife to move under SR-241 across the western extant of the Santa Ana Mountains and is designed to functionally link the Natural Communities Conservation Plan (NCCP) Reserve with the Coal Canyon Reserve, Lomas de Santiago, and the Cleveland National Forest.[1]

3.2.5.1.3. Wetlands

As described in the Proposed Project's Jurisdictional Delineation there are several drainages in the BSA that connect directly or indirectly to the Santa Ana River. The Jurisdictional Delineation prepared for the project identified nine drainage features along SR-91 within the project area, five of which may be subject to USACE, California Department of Fish and Wildlife (CDFW), and RWQCB jurisdiction. One drainage feature at the east end of SR-91 already has a USACE approved determination and was found to be nonjurisdictional.[2] The remaining three drainage features are considered nonjurisdictional because they have been excavated on dry land during the construction of SR-241 and SR-91 for the sole purpose of collecting sheet flow from upland areas or, in most cases, roadway runoff. No wetland waters were observed within the project limits that met the USACE three-parameter hydrophytic vegetation, hydric soils, and wetland hydrology requirements. [3]

3.2.5.1.4. Fish Passage

It is unlikely that the altered or wholly human-made and ephemeral flow of the drainages within the project area would provide necessary habitat to support fish. Much of the Santa Ana River channel has been contained in concrete-lined channels and, therefore, would not support fish habitat.[4] The Santa Ana River, Reach 2, eventually drains into the Pacific Ocean. The Pacific Ocean is used for commercial and recreational fishing.

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1 LSA Associates, Inc. 2015. *SR-241/SR-91 Express Lanes Connector Project Natural Environment Study.*
2 Ibid.
3 LSA Associates, Inc. 2015. *Jurisdictional Delineation.*
4 Orange County Water District. 2015. Santa Ana River Watershed. Last accessed April 23, 2015, from http://www.ocwd.com/Environment/SantaAnaRiverWatershed.aspx.

3.3. Water Quality Objectives/Standards and Beneficial Uses

3.3.1. Surface Water Quality Objectives/Standards and Beneficial Uses

Surface water quality objectives for all inland waters in the Santa Ana Region as documented in the *Basin Plan* are listed in Table A. In addition, the San Ana River, Reach 2, has the following site-specific numeric Water Quality Objectives:[1]

- **Total Dissolved Solids (TDS):** 650 milligrams per liter (mg/L)[2]

Beneficial uses of water are defined in the Santa Ana RWQCB Basin Plan as those necessary for the survival or well-being of humans, plants, and wildlife. Examples of beneficial uses include drinking water supplies, swimming, industrial and agricultural water supply, and the support of freshwater and marine habitats and their organisms.

Beneficial uses are identified in the Basin Plan for the Santa Ana River, Reach 2, from 17th Street in Santa Ana to Prado Dam. The intermittent beneficial uses include the following[3]:

- **AGR:** Agricultural Water Supply
- **GWR:** Groundwater Recharge
- **REC-1:** Contact Water Recreation (swimming/wading)
- **REC-2:** Noncontact Water Recreation (boating/fishing)
- **WARM:** Warm Freshwater Habitat (for fish amenable to reproduction in warm water)
- **WILD:** Wildlife Habitat (for wild plants and animals)
- **RARE**: Rare, Threatened, or Endangered Species (habitat for plants and animals)

3.3.2. Groundwater Quality Objectives/Standards and Beneficial Uses

The groundwater quality objectives for Santa Ana Region as designated in the *Basin Plan* are provided in Table B. The site-specific groundwater quality objectives for the Orange County Groundwater Basin are:

- **Total Dissolved Solids (TDS):** 580 mg/L
- **Nitrate as Nitrogen:** 3.4 mg/L

1 California Regional Water Quality Control Board, Santa Ana Region. Water Quality Control Plan, Santa Ana River Basin. 1995. Updated February 2008 and June 2011.
2 Five-year moving average.
3 California Regional Water Quality Control Board, Santa Ana Region. *Water Quality Control Plan, Santa Ana River Basin.* 1995. Updated February 2008 and June 2011.

Table A: Surface Water Quality Objectives for Inland Surface Waters

Constituent	Concentration	Receiving Waters
Algae	Waste discharges shall not contribute to excessive algal growth in inland surface receiving waters.	All inland surface waters
Ammonia	Varies based on pH and temperature. Ranges from 0.004 to 0.0224 mg/L unionized ammonia and 0.05 to 1.49 mg/L total ammonia.	COLD beneficial use designation
	Varies based on pH and temperature. Ranges from 0.0006 to 0.0530 mg/L unionized ammonia and 0.119 to 2.27 mg/L total ammonia.	WARM beneficial use designation
Boron	Shall not exceed 0.75 mg/L as a result of controllable water quality factors.	All inland surface waters
Chlorine (residual)	Chlorine residual in wastewater discharged to inland surface waters shall not exceed 0.1 mg/L.	All inland surface waters
Coliform (fecal)	Logarithm means less than 200 organisms per 100 mL based on five or more samples per 30-day period and not more than 10% of the samples exceed 400 organisms per 100 mL for any 30-day period.	REC-1 beneficial use designation
	Logarithm means less than 2,000 organisms per 100 mL based on five or more samples per 30-day period and not more than 10% of the samples exceed 4,000 organisms per 100 mL for any 30-day period.	REC-2 beneficial use designation
Coliform (total)	Not to exceed 100 organisms per 100 mL.	MUN beneficial use designation
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish, or other inland surface water resources used for human consumption shall not be impaired.	All inland surface waters
Floatables	Waste discharges shall not contain floating materials, including solids, liquids, foam, or scum, that cause a nuisance or adversely affect beneficial uses.	All inland surface waters
Fluoride	Shall not exceed 0.7 to 1.2 mg/L as a result of controllable water quality factors depending on air temperature (refer to Basin Plan).	MUN beneficial use designation
Metals	Varies based on hardness.	All inland surface waters
Methylene blue-activated substances	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Nitrate	Shall not exceed 45 mg/L as NO_3 or 10 mg/L as N.	MUN beneficial use designation
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that result in a visible film or in coating objects in the water or that cause a nuisance or adversely affect beneficial uses.	All inland surface waters
Oxygen (dissolved)	Shall not be depressed below 5 mg/L a result of controllable water quality factors.	WARM beneficial use designation
	Shall not be depressed below 6 mg/L a result of controllable water quality factors.	COLD beneficial use designation

Table A: Surface Water Quality Objectives for Inland Surface Waters

Constituent	Concentration	Receiving Waters
	Waste discharges shall not cause the median dissolved oxygen concentration to fall below 85% of saturation or the 95th percentile concentration, or fall below 75% of saturation within a 30-day period.	All inland surface waters
pH	Shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.	All inland surface waters
Radioactivity	Shall not exceed the California Code of Regulations, Title 22, standards of 5 pCi/L for combined radium-226 and radium-228, 15 pCi/L for gross alpha, 20,000 pCi/L for tritium, 8 pCi/L for strontium-90, 50 pCi/L for gross beta, and 20 pCi/L for uranium.	MUN beneficial use designation
Solids (suspended and settleable)	Shall not cause nuisance or adversely affect beneficial uses.	All inland surface waters
Sulfides	Shall not be increased as a result of controllable water quality factors.	All inland surface waters
Surfactants	Waste discharges shall not contain concentrations of surfactants that result in foam in the course of flow or use of the receiving water or that adversely affect aquatic life.	All inland surface waters
Taste and odor	Shall not contain taste- or odor-producing substances at concentrations that cause a nuisance or adversely affect beneficial uses.	All inland surface waters
Temperature	Shall not be raised above 90°F from June through October or above 78°F during the rest of the year as a result of controllable water quality factors.	WARM beneficial use designation
	Shall not be increased by more than 5°F as a result of controllable water quality factors.	COLD beneficial use designation
Toxic substances	Shall not be discharged at levels that will bioaccumulate in aquatic resources to levels that are harmful to human health. Concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.	All inland surface waters
Turbidity	Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20 percent. Where natural turbidity is between 50 and 100 JTU, increases shall not exceed 10 NTU. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent.	All inland surface waters

Source: *Water Quality Control Plan – Santa Ana River Basin.* 1995 (updated February 2008 and June 2011).

°F = degrees Fahrenheit
Basin Plan = Water Quality Control Plan – Santa Ana River Basin
COLD = Cold Freshwater Habitat
JTU = Jackson turbidity units
mg/L = milligrams per liter
mL = milliliters
MUN = Municipal and Domestic Water Supply
N = nitrogen
NO_3 = nitrate
NTU = nephelometric turbidity units
pCi/L = picocuries per liter
pH = percentage of hydrogen
REC-1 = Contact Water Recreation
REC-2 = Noncontact Water Recreation
WARM = Warm Freshwater Habitat

Table B: Groundwater Quality Objectives for Groundwater Basins

Constituent	Concentration	Area
Arsenic	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Boron	Shall not exceed 0.75 mg/L as a result of controllable water quality factors.	Santa Ana Region
Chloride	Shall not exceed 500 mg/L as a result of controllable factors.	MUN beneficial use designation
Coliform (total)	Shall not exceed 2.2 organisms/100 mL median over any 7-day period as a result of controllable water quality factors.	MUN beneficial use designation
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses.	Santa Ana Region
Cyanide	Shall not exceed 0.2 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Fluoride	Shall not exceed 1.0 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Hardness	Shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.	MUN beneficial use designation
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that cause a nuisance or adversely affect beneficial uses.	Santa Ana Region
Barium	Shall not exceed 1.0 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Cadmium	Shall not exceed 0.01 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Chromium	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Cobalt	Shall not exceed 0.2 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Copper	Shall not exceed 1.0 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Iron	Shall not exceed 0.3 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Lead	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Manganese	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Mercury	Shall not exceed 0.002 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Selenium	Shall not exceed 0.01 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Silver	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Methylene blue-activated substances	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
pH	The pH of groundwater shall not be raised above 9 or depressed below 6 as a result of controllable water quality factors.	Santa Ana Region

Table B: Groundwater Quality Objectives for Groundwater Basins

Constituent	Concentration	Area
Radioactivity	Shall not exceed the California Code of Regulations, Title 22, standards of 5 pCi/L for combined radium-226 and radium-228, 15 pCi/L for gross alpha, 20,000 pCi/L for tritium, 8 pCi/L for strontium-90, 50 pCi/L for gross beta, and 20 pCi/L for uranium.	MUN beneficial use designation
Sodium	Shall not exceed a sodium absorption rate of 9.	AGR beneficial use designation
Sulfate	Shall not exceed 500 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Taste and odor	Groundwater shall not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses.	Santa Ana Region
Toxic substances	All waters shall be maintained free of substances in concentrations that are toxic or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	Santa Ana Region

Source: *Water Quality Control Plan – Santa Ana River Basin.* 1995 (updated February 2008 and June 2011).
AGR = Agricultural Water Supply
MUN = Municipal Water Supply
mg/L = milligrams per liter
pCi/L = picocuries per liter
mL = milliliters
pH = percentage of hydrogen

The present or potential beneficial uses identified in the Basin Plan for the Orange County Groundwater Management Zone include:

- **MUN:** Municipal and Domestic Supply
- **AGR:** Agricultural Supply
- **IND:** Industrial Supply
- **PROC:** Process Water Supply

3.4. Existing Water Quality

3.4.1. Regional Water Quality

3.4.1.1. Surface Water Quality

The surface waters are within the Lower Santa Ana River WMA. Significant water quality issues in the Santa Ana River Watershed include nitrogen/TDS management in the Santa Ana River and water quality problems associated with dairies and coastal beaches. Water quality degradation due to high concentrations of nitrogen and TDS is among the most significant regional water quality problems in the Santa Ana River Watershed.[1]

[1] Santa Ana Regional Water Quality Control Board. 2006. Watershed Management Initiative. Last accessed April 23, 2015, from http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/wmi/index.shtml.

3.4.1.2. Groundwater Quality

Water within the Orange County Groundwater Management Zone is primarily sodium-calcium bicarbonate. TDS range from 232 to 661 mg/L and average 475 mg/L. Groundwater is impaired by salinity, nitrate, and methyl tertbutyl ether (MTBE).[1]

3.4.2. List of Impaired Waters

The SWRCB approved the 2012 Integrated Report (Conceptual Water Quality [CWQ] Section 303(d) List Report) on August 8, 2015. On July 30, 2015, the EPA approved the 2012 California 303 (d) List of Water Quality Limited Segments.[2] There are no additional 303(d) listings or delistings for the Santa Ana Region on the 2012 303(d) List compared to the 2010 303(d) List. Therefore, the Santa Ana River, Reach 2, is listed on the 2012 California 303 (d) List as impaired for indicator bacteria.[3]

3.4.2.1. TMDL Requirements

There are no approved TMDLs for Reach 2 of the Santa Ana River. The expected completion date for the indicator bacteria TMDL is 2021.

3.4.3. Areas of Special Biological Significance

Areas of Special Biological Significance (ASBS) are a subset of State water quality protection areas and require special protection as determined by the SWRCB pursuant to the California Ocean Plan. There are no ASBS, as defined by the SWRCB, in the project area. There are a total of three ASBS along the Orange County coastline. These include the Robert E. Badham ASBS, which consists of 0.7 mi of coastline in Orange County just south of the Newport Bay; the Irvine Coast (Crystal Cove) ASBS, which also begins south of Newport Bay at Pelican Point and continues 3.4 mi along the coastline to the City of Laguna Beach; and the Heisler Park ASBS, which also begins south of Newport Bay and covers 0.5 mi of coastline.[4] Runoff from the project area does not drain into an ASBS.

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1 California Department of Water Resources. 2004. Coastal Plain of Orange County Groundwater Basin. Last accessed April 23, 2015, from http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/8-1.pdf.

2 California State Water Resources Control Board. 2012. Impaired Water Bodies. Last accessed July 31, 2015, from http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml.

3 California State Water Resources Control Board. 2012. 2012 Integrated Report (CWA Section 303 (d) List Report).

4 California State Water Resources Control Board. 2015. California's Areas of Special Biological Significance. Last accessed April 23, 2015, from http://www.waterboards.ca.gov/water_issues/programs/ocean/asbs_map.shtml.

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4. Environmental Consequences

4.1. Introduction

This chapter discusses the potential environmental effects related to water quality with implementation of the project, as well as the procedures and practices that will be applied to reduce those effects.

Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During construction activities, excavated soil would be exposed and there would be an increased potential for soil erosion compared to existing conditions. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported via storm runoff into receiving waters.

Pollutants of concern during operation of the Build Alternative include suspended solids/ sediments, nutrients, pesticides, heavy metals, oil and grease, toxic organic compounds, and trash and debris. The Build Alternative would result in a permanent net increase in impervious surface area of 20.5 ac. An increase in impervious area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters.

Caltrans completed a comprehensive set of studies designed to characterize storm water runoff from transportation facilities throughout the State of California. The study results were published in 2003 in a report titled *Stormwater Monitoring & Data Management, Discharge Characterization Study Report.* Table C presents the concentrations of typical pollutants found on State highways based on the monitoring conducted as part of the Caltrans 2003 *Statewide Discharge Characterization Study Report.*

Storm water runoff from the Build Alternative is discharged directly into the Santa Ana River, Reach 2, and, ultimately, the Pacific Ocean. Storm water runoff from the Build Alternative would be collected and conveyed by the existing storm water infrastructure along with newly developed and modified drop inlets with connecting pipes, dikes, median drainage systems, deck drain systems, and edge drains that would convey storm water to existing cross culverts. The proposed surface drainage system would be linked to the existing drainage system.

The project is within the ETC. Existing treatment BMPs within the ETC include water quality inlets, hazardous materials basins, culvert energy dissipation, vegetated swales, and detention basins, which capture the runoff from the toll roads as well as the surrounding development. Existing treatment BMPs within the project area adjacent to the junction of SR-241 and SR-91 and at the toll plaza include a hazardous materials basin and water quality inlets. The project would implement Caltrans-approved Treatment BMPs to the maximum extent practicable (MEP), which would include biofiltration swales and strips and media filters. These are discussed below within the context of potential project-related water quality impacts.

Table C: Summary Statistics for Water Quality Data for Highway Facilities

Constituent	Concentration
pH	7.1
TSS	112.7 mg/L
NH_3-N	1.08 mg/L
NO_3-N	1.07 mg/L
TKN	2.06 mg/L
Ortho-phosphate	0.11 mg/L
Dissolved Copper	14.9 µg/L
Dissolved Zinc	68.8 µg/L
Dissolved Lead	7.6 µg/L
Total Copper	33.5 µg/L
Total Zinc	187.1 µg/L
Total Lead	47.8 µg/L

Data Source: Caltrans *Stormwater Monitoring & Data Management, Discharge Characterization Study Report* (CTSW-RT-03-065.51.42), Table 3-2, *Summary Statistics for Highway Facilities* , Mean Values

µg = micrograms
L = liter
mg = milligrams
NH_3-N = ammonia
NO_3-N = nitrate
pH = percentage of hydrogen
TKN = total Kjeldahl nitrogen
TSS = total suspended solids

4.2. Potential Impacts to Water Quality

4.2.1. Anticipated Changes to the Physical/Chemical Characteristics of the Aquatic Environment

4.2.1.1. Substrate

Runoff from the Build Alternative would drain directly in the Santa Ana River, Reach 2. The Build Alternative would not discharge into unlined channels.[1] Therefore, there is a minimal amount of substrate to erode and to be carried downstream. Because the project's storm water is discharged to a lined channel rather than a natural channel, there is limited opportunity for on-site erosion and accretion to occur.

Construction activities disturb soil and increase the potential for soil erosion. Through the construction of the Proposed Project, land and vegetation would be cleared, exposing soil to the potential for erosion and downstream transport of sediment to occur. During construction, the Build Alternative would comply with the requirements of the Construction General Permit. Under the Construction General Permit, the Build Alternative would be required to prepare a SWPPP and implement Construction BMPs including, but not limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site. Therefore, there is a low potential for construction-related activities associated with the Build Alternative to adversely affect the downstream substrate.

[1] RBF Consulting. 2014. *Storm Water Data Report.*

The Build Alternative would result in a net increase in impervious surface area of approximately 20.5 ac. Increases in impervious surface area decrease infiltration and increase the volume of runoff during a storm, which can more effectively transport sediment to receiving waters. The downstream transport of sediment has the potential to change the substrate of the downstream receiving waters. During operation, storm water runoff would be treated with Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters. Biofiltration swales and strips and media filters would: target and process pollutants of concern, including sediment, from the operation of the Proposed Project; provide flow volume and duration control functions; and promote infiltration, thereby reducing the downstream transport of sediment and reducing the energy of the flows of storm water runoff. The biofiltration swales and strips and media filters would also help to prevent an increase in erosive velocities from storm water flows. Therefore, there is a low potential for operational activities associated with the Build Alternative to adversely affect the downstream substrate.

4.2.1.2. Currents, Circulation, or Drainage Patterns

With construction of the Proposed Project, the Build Alternative would result in a net increase in impervious surface area of approximately 20.5 ac. Increases in impervious surface area can change on-site drainage patterns, decrease infiltration, and increase the volume and rate of runoff during a storm. Storm water runoff from the Build Alternative would be collected and conveyed by the existing storm water infrastructure along with newly developed and modified drop inlets with connecting pipes, dikes, median drainage systems, deck drain systems, and edge drains that would convey storm water to existing cross culverts. The road widening, construction of the Proposed Project, and reconstruction of the ramps and connectors would impact the existing storm water infrastructure and, in some cases, require the removal, abandonment, and replacement of existing drop inlets and culverts. However, the Build Alternative would preserve the existing drainage system as much as possible. In addition, the Build Alternative includes the implementation of Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters. These biofiltration swales and strips and media filters would be linked to the existing drainage system. The proposed biofiltration swales and strips and media filters would provide flow duration, volume, and rate control functions and promote infiltration to offset the increased flows associated with the increase in impervious surface from the project area. By preserving existing drainage patterns to the extent practicable and adding biofiltration swales and strips and media filters to the existing drainage system, storm water flow concentrations associated with the project area would be similar to current conditions, which would minimize seasonal changes in storm water flows. Therefore, the Build Alternative would result in only a negligible increase in flow velocities and volumes. Therefore, there is a low potential for the Build Alternative to adversely affect currents, circulation, and drainage patterns.

4.2.1.3. Suspended Particulates (Turbidity)

Natural sediment loads are important to downstream environments in that they provide habitat, substrate, and nutrition; however, increased sediment loads can result in several negative effects to downstream environments. Excessive sediment can be detrimental to aquatic life by interfering with photosynthesis, respiration, growth, and reproduction. In addition, pollutants that adhere to sediment, such as nutrients, trace metals, and

hydrocarbons, can have other harmful effects on the aquatic environment when they occur at elevated levels.

Construction activities disturb soil and increase the potential for soil erosion. During grading, excavation, construction of retaining walls and bridge structures, and overall road widening, vegetation would be cleared, exposing soil to the potential for erosion. Suspended particles can also be generated from vehicles operating on a roadway during construction activities. When soil erodes, the potential for sediments/suspended particles to enter surface waters increases, and an increase in sediment/suspended particles in turn increases turbidity (water cloudiness). During construction, the Build Alternative would comply with the requirements of the Construction General Permit. Under the Construction General Permit, the project would be required to prepare a SWPPP and implement Construction BMPs including, but not limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site. Therefore, there is a low potential for construction-related activities associated with the Build Alternative to result in adverse effects related to suspended particles.

The increased impervious area associated with the Build Alternative would increase the volume and velocity of runoff during a storm, which can transport a greater concentration of pollutants to receiving waters; lead to downstream erosion; and increase suspended particles and sediment. In addition, as in the existing condition, vehicles operating on the freeways for maintenance activities could generate suspended particles and sediment. Increases in suspended particles and sediment result in increases in turbidity. During operation, the Build Alternative would treat storm water runoff with Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters. Biofiltration swales and strips and media filters would target and process pollutants of concern from the operation of transportation facilities, including sediment, and along with the proposed Design Pollution Prevention BMPs, would prevent an increase in erosive storm water flow velocities, thereby reducing the amount of suspended particles. Therefore, there is a low potential for operational activities associated with the Build Alternative to contribute to adverse effects related to suspended particles.

4.2.1.4. Oil, Grease and Chemical Pollutants

Heavy metals, pesticides, petroleum hydrocarbons (oil and grease), and organic compounds can be toxic to aquatic life. In addition, some of these compounds can bioaccumulate (concentrate within the body) over several years, resulting in health problems for the affected organism. For example, these compounds can effect reproduction, the nervous system, and other biological functions.

Construction activities for the project (road widening, construction of bridge structures and retaining walls, etc.) involve grading and earthmoving activities. Grading and earthmoving equipment is a source of chemicals, liquid products, and petroleum products if the equipment leaks. Chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported via stormwater runoff into receiving waters. The Build Alternative would comply with the requirements of the Construction General Permit. Under the Construction General Permit, the Build Alternative would be required to prepare a SWPPP and implement Construction BMPs

including, but not limited to, Good Housekeeping BMPs to prevent spills, leaks, and discharges of construction debris and waste into receiving waters. Therefore, there is a low potential for construction activities associated with the Build Alternative to contribute to adverse effects related to oil, grease, and chemical pollutants.

During operation, oil and grease and toxic organic compounds are pollutants of concern. These pollutants of concern can be generated from maintenance activities as well as vehicles operating on the site. However, the Build Alternative would treat storm water runoff with Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters. Biofiltration swales and strips and media filters would target and process pollutants of concern from the operation of transportation facilities, including oil, grease, and other chemical pollutants. Therefore, there is a low potential for operational activities associated with the Build Alternative to contribute to adverse effects related to oil, grease, and chemical pollutants.

4.2.1.5. Temperature, Oxygen, Depletion and Other Parameters

Water temperature can affect survival, spawning success, and metabolic rates of aquatic animals. In addition, increased water temperature decreases the availability of dissolved oxygen, promotes algal and bacterial growth, and increases sensitivity of organisms to pollution, parasites, and disease. Water detained on construction sites has the potential to reach ambient air temperature, which could increase surface water temperature if discharged during storm events. During operation, storm water falling on or flowing over warm pavement can increase the temperature of runoff.

Nutrients are typically composed of phosphorus and/or nitrogen. Elevated levels in surface waters cause algal blooms and excessive vegetative growth. As nutrients are absorbed, the vegetative growth decomposes, utilizing oxygen in the process and reducing dissolved oxygen levels. Dissolved oxygen is critical for support of aquatic life. The ammonium form of nitrogen (found in wastewater discharges) converts to nitrite and nitrate in the presence of oxygen, which further reduces the dissolved oxygen levels in water. Temporary or portable sanitary facilities may be provided for construction workers and could be a source of sanitary waste, i.e., nutrients that would be a pollutant of concern during construction. Nutrients would also be a pollutant of concern during operation due to the presence of on-site re-vegetation, which may require the application of fertilizers to establish the vegetation. Sources of phosphorus that may be present in highway runoff include tree leaves, surfactants and emulsifiers, and natural sources such as the mineralized organic matter in soils. Potential sources of nitrogen in highway runoff include atmospheric fallout, nitrite discharges from automobile exhausts, fertilizer runoff, and natural sources such as mineralized soil organic matter.

Trash and debris can interfere with aquatic life respiration and can be harmful or hazardous to aquatic animals that mistakenly ingest floating debris. Construction workers can generate trash and debris (i.e., food wrappers) and construction waste and debris (e.g., broken concrete and wood, rocks, reclaimed asphalt). During operation, trash and debris are pollutants of concern that are generated from maintenance/repair activities (e.g., maintenance workers and vehicles using the roads).

During construction, the Build Alternative would comply with the requirements of the Construction General Permit. Under the Construction General Permit, the Build Alternative would be required to prepare a SWPPP and implement Construction BMPs detailed in the SWPPP during construction activities. Construction BMPs would include, but not be limited to, Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. Therefore, there is a low potential for construction activities associated with the Build Alternative to contribute to adverse effects associated with temperature, oxygen depletion, trash, and debris.

In addition, when appropriate, the Build Alternative would include Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters that would target and process pollutants of concern from the operation of transportation facilities, including nutrients and debris. Therefore, there is a low potential for the Build Alternative to contribute to adverse effects related to temperature, oxygen depletion, trash, and debris.

4.2.1.6. Flood Control Functions

The project is adjacent to the Santa Ana River, which runs parallel to SR-91. The Santa Ana River and area north of SR-91 is within the 100-year Flood Zone AE and Regulatory Floodway of the Santa Ana River. However, no project improvements would occur within Zone AE and the project is not anticipated to encroach into the 100-year floodplain of the Santa Ana River. A small portion of the project along SR-241 is within Flood Zone X. However, the portions of the project within Zone X do not include major roadway alterations or any cut or fill. The work in these areas is limited to re-striping of existing pavement and a shift of the median barrier to accommodate the alignment of the Proposed Project.[1] As a result, the Build Alternative would not alter the existing flood control functions along the existing SR-241 or SR-91 roadway. Therefore, the Build Alternative would not have an adverse effect on flood control functions of surface waters or storm drain facilities in or downstream of the project area.

4.2.1.7. Storm, Wave, and Erosion Buffers

Wetlands serve as buffer zones, shielding upland areas from wave actions, storm damage, and erosion. However, there are no areas in the project area that are considered to be wetland waters of the United States. Therefore, the Build Alternative would not change existing storm, wave, and erosion buffers within the project area, and there would be no adverse impacts to storm, wave, and erosion buffers.

4.2.1.8. Erosion and Accretion Patterns

Runoff from the Build Alternative would drain directly in the Santa Ana River, Reach 2. The Build Alternative would not discharge into unlined channels.[2] Therefore, there is a minimal amount of substrate to erode and to be carried downstream. Because the project's storm water is discharged to a lined channel rather than a natural channel, there is limited opportunity for on-site erosion and accretion to occur.

1 RBF Consulting. 2014. *Location Hydraulic Study.*
2 RBF Consulting. 2014. *Storm Water Data Report.*

Construction activities disturb soil and increase the potential for soil erosion. Through the construction of the Proposed Project, land and vegetation would be cleared, exposing soil to the potential for erosion. During construction, the Build Alternative would comply with the requirements of the Construction General Permit. Under the Construction General Permit, the Build Alternative would be required to prepare a SWPPP and implement Construction BMPs including, but not limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site. Therefore, there is a low potential for construction-related activities associated with the Build Alternative to adversely affect erosion and accretion.

The Build Alternative would result in a net increase in impervious surface area of approximately 20.5 ac. An increase in impervious surface area decreases infiltration and increases the volume of runoff during a storm, which can lead to changes in downstream erosion and accretion. During operation, storm water runoff would be treated with Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters. Biofiltration swales and strips and media filters would provide flow volume and duration control functions that minimize increases in velocity and volume of runoff, reduce the movement of sediment to downstream receiving waters, and minimize erosion. Because the Build Alternative would include measures to offset increases in velocity and volume of runoff and minimize erosion, there is a low potential for the Build Alternative to adversely affect downstream erosion and accretion patterns.

4.2.1.9. Aquifer Recharge/Groundwater

Groundwater dewatering may be necessary during construction of bridge footings for the proposed bridge at the junction of SR-91 and SR-241. Disposal of groundwater during dewatering has the potential to introduce pollutants to surface waters such as organic and inorganic pollutants. Permanent groundwater dewatering during operation would not be required.

The Build Alternative would result in a net increase in impervious surface area of approximately 20.5 ac. An increase in impervious surface area decreases infiltration, which decreases the amount of water that is able to recharge the aquifer/groundwater. However, the soils within the project area are classified as having very low to low infiltration rates. Because the soils in the project area have very low to low infiltration rates, an increase in impervious surface area would not substantially reduce infiltration compared to existing conditions. Therefore, impacts to aquifer/groundwater recharge would not be adverse.

4.2.1.10. Baseflow

Baseflow is the streamflow resulting from precipitation that infiltrates into the soil and eventually moves through the soil to the stream channel. This is also referred to as groundwater flow or dry-weather flow. The drainages in the project area do not contain persistent dry-weather flow. In addition, as discussed above, the most common soils in the project area have low infiltration rates. However, along SR-91 stretch there are some large pockets of soils with high infiltration rates. Since a majority of the soils within the project area have low infiltration rates and high runoff potential, there would be little or no baseflow in the project area. Where construction may disturb existing vegetated slopes, the disturbed

slopes would be landscaped with appropriate native vegetation. The existing vegetation is non-irrigated and the disturbed vegetation would be replaced in kind with an erosion control mix. Since irrigation is not required for the replaced vegetation, the Build Alternative would not create dry-weather flows. Therefore, any existing baseflow would not be impacted by the Build Alternative.

4.2.2. Anticipated Changes to the Biological Characteristics of the Aquatic Environment

4.2.2.1. Special Aquatic Sites

No special aquatic sites exist within the project area. Therefore, no special aquatic sites would be impacted by the Build Alternative.

4.2.2.2. Habitat for Fish and Other Aquatic Organisms

No habitat for fish or other aquatic organisms exists on site. Therefore, no habitat for fish or other aquatic organisms would be impacted by the Build Alternative.

4.2.2.2.1. Fish Passage (Beneficial Uses)

It is unlikely that altered or wholly human-made and ephemeral flow of the drainages within the project area would provide necessary habitat to support fish. In addition, much of the Santa Ana River has been contained in concrete-lined channels and, therefore, would not support fish habitat. Therefore, no fish passage would be impacted by the Build Alternative.

4.2.2.3. Wildlife Habitat

Some of the drainage features within the project area contain sparse riparian vegetation. Sparse riparian vegetation consists of mulefat (*Baccharis salicifolia*), Mediterranean tamarisk (*Tamarix ramosissima*), willow species, and western cottonwood (*Populus fremontii* ssp. *fremontii*). No impacts are anticipated to these species within and surrounding the drainage features. In addition, the project would not impact any known aquatic or aquatic-dependent special-status plant species.

The project area supports suitable habitat for a variety of wildlife species. Suitable nesting habitat for Allen's hummingbird, Lawrence's goldfinch, and Cooper's hawk is present within the BSA. Avoidance and minimization measures outlined in the NES would reduce potential impacts to these species. In addition, suitable roosting habitat for special-status bat species is present within the BSA. Special-status bat species, including western small-footed myotis and Yuma myotis, were observed at the Coal Canyon box culvert and Gypsum Canyon box culvert. Avoidance and minimization measures outlined in the NES would reduce potential impacts to these species.

4.2.2.3.1. Wildlife Passage (Beneficial Uses)

Wildlife movement and habitat fragmentation are greatly affected by roads. Several wildlife crossings were constructed into SR-241 to allow for wildlife movement, including the Windy Ridge Wildlife Undercrossing in the southern part of the BSA. The

Build Alternative would widen the southbound bridge structure at the Windy Ridge Wildlife Undercrossing along SR-241. Although it will decrease the openness ratio by a small increment (23 percent decrease from 12.1 m to 9.3 m [39.6 ft to 30.5 ft]), the openness ratio is not reduced enough to discourage wildlife use or have a long-term effect on larger wildlife utilization of the crossing.[1] Construction duration at this location should be minimized as much as is feasible and should occur only during daylight hours, subject to public health and safety considerations. Avoidance and minimization measures for wildlife movement are provided in the NES.

4.2.2.4. Endangered or Threatened Species

There are no aquatic or aquatic-dependent endangered or threatened wildlife species known or expected to occur within the project area.

4.2.2.5. Invasive Species

Exotic plant species exist within the nonnative plant communities throughout the BSA, within patches of native plant communities, and in areas that have been disturbed by human uses. A total of 29 exotic plants occurring on the California Invasive Plant Council's (Cal-IPC) California Invasive Plant Inventory were identified. Of these species, there are 4 with an overall high rating, 12 with a moderate rating, and 13 with a limited rating. In compliance with Executive Order (EO) 13112, invasive species would be removed from the project work area and controlled during construction. In addition, affected areas would not be revegetated with plant species listed in Cal-IPC's California Invasive Plant Inventory with a high or moderate rating. In areas adjacent to native vegetation, the use of plant species native to the vicinity would be used as described in the Biological Opinion (BO). In addition, inspection and cleaning of construction equipment would be performed to minimize the importation of nonnative plant material, and eradication strategies would be employed should an invasion occur.

4.2.3. Anticipated Changes to the Human Use Characteristics of the Aquatic Environment

4.2.3.1. Existing and Potential Water Supplies; Water Conservation

Water service within the area adjacent to the project limits is provided by the City of Anaheim and the City of Yorba Linda. The Build Alternative would require the removal of existing non-irrigated vegetation, which would be replaced in kind with an erosion control mix. Therefore, the Build Alternative would not require irrigation and there are no other demands for harvested water that exist on the project site. During construction, water would be used as necessary for construction-related activities such as dust control, and fire suppression, etc.

[1] The openness ratio recommended for mule deer is greater than 0.6 meter.

4.2.3.2. Recreational or Commercial Fisheries

Changes in water quality can affect the survival of fish and other aquatic organisms that would have deleterious impacts to recreational and commercial fisheries. Runoff from the Build Alternative would drain directly into the Santa Ana River, Reach 2. The Santa Ana River, Reach 2 is used for recreational purposes but not for commercial fishing. However, the Basin Plan states that recreational uses should not be construed as encouraging recreational activities. Furthermore, in certain reaches of the Santa Ana River, access to the water bodies is prohibited because of potentially hazardous conditions and/or because of the need to protect other uses. The Santa Ana River eventually drains into the Pacific Ocean, which is approximately 20 mi downstream from the Build Alternative and is used for recreational and commercial fishing. The Build Alternative includes biofiltration swales and strips and media filters that would target pollutants of concern from transportation facilities. Because runoff from the Build Alternative would be treated using Caltrans-approved Treatment BMPs, and because of the Build Alternative's distance from the Pacific Ocean, there is low potential for the Build Alternative to have adverse effects on recreational or commercial fishing.

4.2.3.3. Other Water Related Recreation

Trash and debris, oil and grease, nutrients, and sediment can decrease the recreational value and safety of a water body for contact and noncontact recreational activities. The Basin Plan identifies both body and non-body contact recreation as intermittent beneficial uses for the Santa Ana River, Reach 2. However, the Basin Plan states that recreational uses should not be construed as encouraging recreational activities. Furthermore, in certain reaches of the Santa Ana River, access to the water bodies is prohibited because of potentially hazardous conditions and/or because of the need to protect other uses.

Pollutants of concern during construction include sediments, trash, and petroleum products. All aspects of a construction project can generate trash, debris, and petroleum products. Construction workers can generate trash, and construction trash and debris can be the result of intersection, street, and freeway ramp improvements and road widening. Chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and therefore have the potential to be transported via storm runoff into receiving waters. The Build Alternative requires construction vehicles and activities that use chemicals, liquid products, and petroleum products. The Build Alternative would be required to develop and implement an effective SWPPP and implement Construction BMPs detailed in the SWPPP during construction activities to address pollutants of concern. Construction BMPs would include, but are not limited to, Erosion and Sediment Control and Good Housekeeping BMPs. Therefore, there is a low potential for construction activities associated with the Build Alternative to have an adverse effect on other water-related recreation.

Pollutants of concern during operation of the Build Alternative include suspended solids/ sediments, nutrients, pesticides, oil and grease, and trash and debris. These pollutants can be introduced by maintenance/repair activities during operation of the project (e.g., repairing pavement, fertilizing vegetation) or by vehicles operating on the facility. During operation, the Build Alternative would treat storm water runoff with Caltrans-approved Treatment

BMPs that include biofiltration swales and strips and media filters. Biofiltration swales and strips and media filters would target pollutants of concern emanating from the Build Alternative, including nutrients, sediments, oil and grease, and trash and debris. The Treatment BMPs would target pollutants of concern in the storm water runoff. Therefore, there is a low potential for operational activities associated with the Build Alternative to have an adverse effect on other water-related recreation.

4.2.3.4. Aesthetics of the Aquatic Ecosystem

The project area includes nine drainage features that discharge directly into the Santa Ana River, Reach 2. Some of the drainage features within the project area are composed of a mixture of natural earthen bottoms and concrete or riprap-lined channels. However, all of these drainages have been altered in some form or are wholly human-made. Because of the disturbed nature of the drainage features, the ephemeral flows, and inability to support aquatic organisms, the drainages within the project area are considered to have little aesthetic value.

Trash and debris, oil and grease, nutrients, and sediment can detract from the aesthetics of a water body. Trash and debris can accumulate within the waterways. Oil and grease float on the water surface and often have a distinctive sheen and/or smell. Sediment increases turbidity and can turn water a murky brown color. Nutrients can promote algal blooms and reduce the clarity of surface waters.

Pollutants of concern during construction include sediments, trash, and petroleum products. Chemicals, liquid products, and petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and therefore have the potential to be transported via storm runoff into receiving waters. Sediment, trash, petroleum products, chemicals, liquid products, and concrete-related waste would be generated from all aspects of the Build Alternative. The Build Alternative would comply with the requirements of the Construction General Permit. Under the Construction General Permit, the Build Alternative would be required to prepare and implement an effective SWPPP during construction to address pollutants of concern. Construction BMPs would include, but are not limited to, Erosion and Sediment Control and Good Housekeeping BMPs. Therefore, there is a low potential for construction activities associated with the Build Alternative to have an adverse effect on the aesthetics of the aquatic ecosystem.

Pollutants of concern during operation of the project include suspended solids/sediments, nutrients, pesticides, oil and grease, and trash and debris. As with construction activities, these pollutants can be introduced during all aspects of the operation of the Build Alternative, including repair/maintenance activities or vehicles operating on the facility. The Build Alternative would include Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters to treat runoff from the project site and reduce pollutants of concern. Because the BMPs would target pollutants of concern in storm water runoff, there is a low potential for the Build Alternative to have an adverse effect on the aesthetics of the aquatic ecosystem.

4.2.3.5. Parks, National and Historic Monuments, National Seashores, Wild and Scenic Rivers, Wilderness Areas, etc.

The Build Alternative's alignment is surrounded by Featherly Regional Park to the north, Chino Hills State Park and Green River Golf Course to the northeast, Gypsum Canyon Nature Preserve to the east and west, and Weir Canyon Nature Preserve to the west. However, the Build Alternative would implement biofiltration swales and strips and media filters that would target pollutants of concern emanating from the project area. In addition, the Build Alternative would implement Construction BMPs aimed at reducing pollutants of concern in the storm water runoff. Therefore, there is a low potential for the Build Alternative to have an adverse effect on parks and preserves in the vicinity of the project area.

4.2.3.6. Traffic/Transportation Patterns

Although construction of the Build Alternative would affect traffic and transportation patterns in the project area, the aquatic resources in the project area are not used for transportation. Therefore, there is no potential for the Build Alternative to have an adverse effect on aquatic traffic/transportation patterns.

4.2.3.7. Energy Consumption or Generation

The waters in the project area are not used for energy generation. Therefore, there is no potential for the Build Alternative to have an adverse effect on energy consumption or energy generation.

4.2.3.8. Navigation

The waters in the project area are altered in some form or are wholly human-made channels and ditches that experience ephemeral flows and are not used for navigation. Therefore, the Build Alternative would not have an adverse effect on navigation.

4.2.3.9. Safety

As discussed previously, the Build Alternative includes a comprehensive drainage system in which an increase in impervious surface area and an increase in the amount of runoff would be managed by the drainage improvements and would not result in an increase in volume and velocity of storm water flows. The Build Alternative would not result in an encroachment into any floodplains or increase flood levels; therefore, the Build Alternative would not result in any adverse effects on safety.

4.2.4. Short Term Impacts during Construction

During construction, the total disturbed area would be 43.9 ac for the Build Alternative and will include the following elements:

- Construction of retaining walls;
- Road widening;
- Grading activities;

- Paving activities;
- Permanent Water Quality Treatment BMPs;
- Construction of bridge structures;
- Addition of an auxiliary express lane;
- Addition of lanes for the connector; and
- Modification of freeway on-/off-ramps.

The following sections summarize the potential for short-term effects of the Build Alternative to the physical/chemical characteristics, biological characteristics, and human use characteristics of the aquatic environment.

4.2.4.1. Physical/Chemical Characteristics of the Aquatic Environment

Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Construction activities associated with the Build Alternative includes grading, excavation, construction of retaining walls and bridge structures, and overall road widening. During construction of the Build Alternative, activities such as grading and excavation could expose soil and increase the potential for soil erosion, which could be a source of downstream sediment. As noted above, when sediment enters a receiving water body, it can increase turbidity, smother bottom-dwelling organisms, and suppress aquatic vegetation growth. When new structures are installed or modified (e.g., retaining walls and road widening), concrete and/or asphalt applications could be a source of fine sediment, metals, and chemicals that could change the pH levels in downstream water bodies. Grading and other earthmoving activities during construction could be a source of petroleum products and heavy metals if the equipment engines leak. Furthermore, temporary or portable sanitary facilities provided for construction workers could be a source of sanitary waste. Under the Construction General Permit, the Build Alternative would be required to prepare a SWPPP and implement Construction BMPs aimed at reducing pollutants of concern in the storm water runoff. Therefore, the potential for short-term water quality impacts associated with construction to adversely affect the physical/chemical characteristics of the on-site or downstream aquatic environment during construction is considered to be low.

4.2.4.2. Biological Characteristics of the Aquatic Environment

The highly altered or wholly human-made drainages in the project area have resulted in limited biological resources that would be able to support a healthy and functioning on-site aquatic environment. However, runoff from the Build Alternative would eventually drain into receiving waters such as the Pacific Ocean, which depends on the biological characteristics of the aquatic environment in order to sustain a functioning aquatic ecosystem, an ecosystem that supports the biological (e.g., fish) and human environment (e.g., recreation). Under the Construction General Permit, the Build Alternative would be required to prepare a SWPPP and implement Construction BMPs aimed at reducing pollutants of concern in storm water runoff. Therefore, the potential for short-term water quality impacts during construction to adversely affect the biological characteristics of the on-site or downstream aquatic environment during construction is considered to be low.

4.2.4.3. Human Use Characteristics of the Aquatic Environment

The highly altered or wholly human-made drainages in the project area preclude beneficial uses associated with human activities, such as contact and noncontact recreation. The Basin Plan identifies both body and non-body contact recreation as intermittent uses for the Santa Ana River, Reach 2. However, the Basin Plan states that recreational uses should not be construed as encouraging recreational activities. Furthermore, in certain reaches of the Santa Ana River, access to the water bodies is prohibited because of potentially hazardous conditions and/or because of the need to protect other uses. However, runoff from the Build Alternative would eventually drain into receiving waters such as the Pacific Ocean, which has beneficial uses associated with human activities that include contact and noncontact recreation. Under the Construction General Permit, the Build Alternative would be required to prepare a SWPPP and implement Construction BMPs aimed at reducing pollutants of concern in storm water runoff. Consequently, the Build Alternative would result in negligible changes in the quality of runoff reaching downstream receiving waters during construction. Therefore, the potential for short-term water quality impacts during construction to adversely affect the human use characteristics of the on-site or downstream aquatic environment during construction is considered to be low.

4.2.5. Long-Term Impacts during Operation and Maintenance

The Caltrans Statewide NPDES Permit and SWMP provide the framework for management of storm water discharges and water quality controls within Caltrans right-of-way. The roadway and drainage improvements associated with the Build Alternative include general-purpose lanes, an auxiliary lane, highway ramp modifications, bridge modifications, retaining walls, and permanent Water Quality Treatment BMPs, which would result in a net increase in impervious area of approximately 20.5 ac. This increase in impervious area would cause a long-term increase in velocity at outlets and an increase in the amount of pollutants typically generated by operating and maintaining a transportation facility (TDS, nutrients, trash/litter, oil and grease, heavy metals, etc.). As noted above, increases in sediment and other pollutants in a water body can increase turbidity, smother bottom-dwelling organisms, suppress aquatic vegetation growth, and alter the temperature and pH of a water body. The following section summarizes the potential for long-term effects to the physical/chemical characteristics, biological characteristics, and human use characteristics during operation and maintenance of the Build Alternative.

4.2.5.1. Physical/Chemical Characteristics of the Aquatic Environment

Primary pollutants of concern are pollutants that are expected to be or have the potential to be in project runoff based on proposed land uses and that also have been identified as causing impairments to receiving waters on the most recent 303(d) list or have an established TMDL. Other pollutants of concern are those that are expected to be or have the potential to be in project runoff but do not have an established TMDL for receiving waters and have not been identified as causing impairments to receiving waters. Pollutants of concern during operation of the Build Alternative include the following:

- Suspended solids/sediments
- Nutrients

- Pesticides
- Heavy metals
- Oil and grease
- Trash and debris

These pollutants of concern are typically generated during the operation of a transportation facility. With construction of the Proposed Project, the Build Alternative would increase impervious area by approximately 20.5 ac. An increase in impervious surface area would increase the volume of runoff during a storm, thereby more effectively transporting pollutants to receiving waters, which in turn causes turbidity and downstream erosion or accretion. Increases in chemical pollutants and changes in temperature and pH may lead to detrimental effects to downstream receiving waters. The Build Alternative would include Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters to treat runoff from the project site and reduce pollutants of concern. The proposed BMPs would treat approximately 135 percent of the net new impervious surface area. Because the Build Alternative would implement effective BMPs that would treat the proposed new impervious surface area as well as portions of the existing impervious surface area, there is a low potential for the Build Alternative to have an adverse effect on the physical/chemical characteristics of the on-site or downstream aquatic environment.

4.2.5.2. Biological Characteristics of the Aquatic Environment

As indicated above, there are no biological resources present on site that are dependent on aquatic resources. However, there are biological resources dependent on aquatic resources downstream of the project area (e.g., the Pacific Ocean). As noted above, the Build Alternative would increase the amount of impervious surface area, resulting in an increase in the volume of runoff, thereby increasing the energy of the flows and increasing the downstream transport of pollutants to downstream receiving waters. The Build Alternative would include Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters to treat runoff from the project site and reduce pollutants of concern. Because the project area is in an urbanized area and no biological resources were identified on site that depend on aquatic resources, and because the Build Alternative would implement effective BMPs that would treat storm water runoff from the project site, there is a low potential for the Build Alternative to have an adverse effect on the biological characteristics of the on-site or downstream aquatic environment. Therefore, no long-term water quality impacts to biological characteristics of the aquatic environment are anticipated.

4.2.5.3. Human Use Characteristics of the Aquatic Environment

The highly altered or wholly human-made drainages within the project area preclude beneficial uses associated with human activities (e.g., contact and noncontact recreation). The Basin Plan identifies both body and non-body contact recreation as intermittent beneficial uses of the Santa Ana River, Reach 2. However, as noted above, the Basin Plan states that recreational uses should not be construed as encouraging recreational activities. Furthermore, in certain reaches of the Santa Ana River, access to the water bodies is prohibited because of potentially hazardous conditions and/or because of the need to protect other uses. However, runoff from the Build Alternative would eventually drain into receiving

waters such as the Pacific Ocean that have beneficial uses associated with human activities, including contact and noncontact recreation. The Build Alternative would include Caltrans-approved Treatment BMPs that include biofiltration swales and strips and media filters to treat runoff from the project site and reduce pollutants of concern. Therefore, the Build Alternative would result in negligible changes in the quality of runoff that reaches downstream receiving waters during operation of the Build Alternative. Therefore, there is a low potential for the Build Alternative to have an adverse effect on human use characteristics of the on-site or downstream aquatic environment.

4.3. Impact Assessment Methodology

This WQAR analyzes the differences between the existing condition and the project build condition with respect to water quality impacts. The WQAR takes the following into consideration:

- Pollutant sources (change in land use)
- Impervious area and relation to amount of runoff (increase or decrease)
- Application of BMPs (number of BMPs, new technologies, effectiveness)
- Discharges into impaired waters (listed pursuant to Section 303[d] of the CWA)

4.4. Alternative-Specific Impact Analysis

4.4.1. No Build Alternative

Under the No Build Alternative, no improvements would be made. Therefore, the No Build Alternative would not result in any short-term water quality impacts from construction-related activities. In addition, under the No Build Alternative, there would be no increase in impervious area at the junction of SR-241 and SR-91. Therefore, the No Build Alternative would not result in an increase in storm water runoff or long-term pollutant loading compared to existing conditions.

4.4.2. Build Alternative

4.4.2.1. Construction

Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. The total disturbed area would be 43.9 ac.

During construction, there is also the potential for construction-related pollutants to be spilled or leaked or to be transported via storm runoff into drainages adjacent to the project area and thereby into downstream receiving waters. The following construction-related pollutants have the potential to impact water quality: chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste. These pollutants

may be spilled or leaked and have the potential to be transported via storm runoff into receiving waters.

As specified in Section 5 in Measure WQ-1, the Build Alternative would comply with the requirements of the Construction General Permit. Under the Construction General Permit, the project would be required to prepare a SWPPP and implement Construction BMPs detailed in the SWPPP during construction activities to minimize erosion and prevent spills. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site and Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. The SWPPP would be developed and Construction BMPs selected and implemented to target pollutants of concern during construction. Because the Construction BMPs would be designed to retain sediment and other pollutants on the project site so they would not reach receiving waters, storm water discharges and authorized nonstorm water discharges are not anticipated to cause or contribute to any violations of applicable water quality standards or objectives or adversely impact human health or the environment. In addition, because Construction BMPs would be designed to retain sediment and other pollutants on the project area so they would not reach receiving waters, runoff during construction would not contain pollutants in quantities that would create a condition of nuisance or adversely affect beneficial uses of waters of the State. When Construction BMPs are properly designed, implemented, and maintained to address pollutants of concern, as required in Measure WQ-1, pollutants of concern would be retained on the project area so they would not reach receiving waters; therefore, no adverse water quality impacts are anticipated during construction of the Build Alternative.

Groundwater dewatering may be necessary during construction of bridge footings for the proposed bridge at the junction of SR-91 and SR-241. As specified in WQ-5 in Section 5, if groundwater dewatering becomes necessary during construction, the Build Alternative would be required to comply with the requirements of Order No. R8-2009-0003 (NPDES No. CAG998001). This permit covers general waste discharge requirements for discharges to surface waters that pose an insignificant (de minimus) threat to water quality within the Santa Ana Region. Under this permit, discharges must comply with discharge specifications, receiving water limitations, and monitoring and reporting requirements detailed in the permit.

As previously discussed, the Santa Ana River, Reach 2 (17th Street in Santa Ana to Prado Dam), is listed on the 2010 California 303(d) List as impaired for indicator bacteria. Pollutants of concern during construction include sanitary waste. Enterococcus, fecal coliform, and total coliform would have the potential to be introduced to the Santa Ana River from fecal matter in sanitary waste. Construction BMPs would include Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction waste, including sanitary waste, into receiving waters. As part of the Good Housekeeping BMPs, construction workers would be provided access to portable toilets. Portable toilets would be located in the staging areas in areas where pollutants would not have the potential to be washed into the Santa Ana River. In addition, disposal of waste from portable toilets would be performed by contracted waste haulers that would handle, haul away, and dispose of portable toilet waste in accordance with applicable regulations. Therefore, construction of the proposed project would not contribute to the indicator bacteria impairment.

4.4.2.2. Operation

Pollutants of concern during operation of the Build Alternative includes suspended solids/ sediments, nutrients, pesticides, heavy metals, oil and grease, toxic organic compounds, and trash and debris. The Build Alternative would result in a permanent net increase in impervious surface area of approximately 20.5 ac. An increase in impervious area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters. Also, an increase in impervious surface would also increase the total amount of pollutants in the storm water runoff and nonstorm water runoff, which would increase the amount of pollutants traveling to on-site drainages and to downstream receiving waters.

As specified in Section 5 in Measures WQ-2 through WQ-4, the Build Alternative would comply with the Caltrans NPDES Permit and would implement Caltrans-approved Design Pollution Prevention and Treatment BMPs to reduce the discharge of pollutants of concern to the maximum extent practicable (MEP). Design Pollution Prevention BMPs are measures that focus on reducing or eliminating runoff and controlling sources of pollutants during operation of the project. Treatment BMPs utilize a treatment mechanism to remove pollutants that have entered storm water runoff. Design Pollution Prevention BMPs being proposed as part of the project include the following:

- Consideration of Downstream Effects Related to Potentially Increased Flow:
    - The Build Alternative would modify existing slopes to the minimum extent possible, would not discharge into unlined channels, and would not encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability.
- Slope/Surface Protection Systems:
    - Proposed improvements would consider minimizing cut and fill areas to reduce slope lengths.
    - Disturbed slopes would be landscaped with appropriate native vegetation and would be returned to the original slope (typically 2:1 or flatter).
    - All disturbed embankments would be stabilized.
    - Slopes would be 2:1 or flatter and an erosion control plan would be prepared during the final design.
    - No hard surfaces because there are no slopes greater than 2:1 (H:V).
- Concentrated Flow Conveyance Systems:
    - Ditches, berms, dikes, swales, overside drains, and velocity dissipation devices would be used to reduce erosion from concentrated flows as appropriate.
    - There would be modifications to the existing drainage system.
    - Flared end sections would be used as part of this project.

- Preservation of Existing Vegetation:
  - Existing vegetation would be preserved where feasible.
  - Disturbed vegetation would be replaced with nonirrigated vegetation, with an erosion control mix.
  - Areas of clearing and grubbing include the portions of the roadway being widened, portions along the direct connectors, and all areas that are to be graded.
  - There is the potential for areas to be placed off-limits to the Contractor; this would be further evaluated during final design.
  - The project would not affect or be affected by a floodplain, wetland, problem soils, or steep slopes.

The project is within the ETC. Existing treatment BMPs within the ETC include water quality inlets, hazardous materials basins, culvert energy dissipation, vegetated swales, and detention basins, which capture the runoff from the toll roads as well as the surrounding development. Existing treatment BMPs within the project area adjacent to the junction of SR-241 and SR-91 and at the toll plaza include a hazardous materials basin and water quality inlets.[1] Treatment BMPs being proposed as part of the Build Alternative include biofiltration swales and strips and media filters. Biofiltration swales and strips and media filters would target and process pollutants of concern from the operation of transportation facilities, including nutrients, sediments, oil and grease, and trash and debris. The Build Alternative would increase the existing amount of impervious surface area; however, the Build Alternative would treat the proposed new impervious surface area and a portion of the old impervious surface area, providing greater overall water quality benefits to on-site drainages and downstream receiving waters.

As previously discussed, the Santa Ana River, Reach 2, is listed on the 2010 California 303(d) List of Water Quality Limited Segments as impaired for indicator bacteria; however, indicator bacteria is not a pollutant of concern. Therefore, operation of the Build Alternative would not contribute to the existing impairment.

As stated above, the Treatment BMPs would target constituents of concern from transportation facilities. Therefore, when construction and operational BMPs are implemented in accordance with NPDES Permit requirements as stipulated in Measures WQ-2 through WQ-4, there is a low potential for the Build Alternative to adversely affect water quality.

4.5. Cumulative Impacts

Cumulative development in the project area is a continuation of the existing urban pattern of development that has already resulted in extensive modifications to watercourses in the area. The area's watercourses have been channelized and drainage systems have been put into place to

[1] Silverado Constructors. 1997. *Drainage Report Final Runoff Management Plan for Eastern Transportation Corridor*.

respond to the past urbanization that has occurred in this area. For all cumulative analysis related to hydrology and water quality, the cumulative projects being considered include all potential projected development within the Santa Ana Narrows HSA, because the project area is within this HSA (Figure 4). Because cumulative hydrology and water quality impacts are caused by build out of properties that increase impervious area and pollutant loads, cumulative development is considered to be the build out of the Santa Ana Narrows HSA over an extended period of time, resulting in development of all available parcels, consistent with local and regional plans.

New development and redevelopment can result in increased urban pollutants in dry weather and storm water runoff from project sites. Each project must comply with NPDES permitting requirements and include BMPs to avoid impacts to water quality and local hydrology in compliance with local ordinances and plans adopted to comply with the MS4 Permit and other permits (e.g., Construction General Permit). The Build Alternative must consider impaired receiving waters and annual TMDL loads for receiving waters. The TMDL program is designed to identify all constituents that adversely affect the beneficial uses of water bodies and then identify appropriate reductions in pollutant loads or concentrations from all sources so that the receiving waters can maintain/attain the beneficial uses in the *Basin Plan*. Thus, by complying with TMDLs, the project's contribution to overall water quality improvement in the watershed in the context of the regulatory program is designed to account for cumulative impacts.

The Build Alternative would make modifications and improvements to an existing roadway. The Build Alternative includes a series of biofiltration swales and strips and media filters that would reduce pollutant concentrations from runoff from the widened roadway, addition of new lanes, and on-/off-ramp connectors.

Regional programs and BMPs, such as TMDL programs and the MS4 Permit Program, have been designed under an assumption that the Santa Ana Narrows HSA would continue its pattern of urbanization. The regional control measures contemplate the cumulative effects of proposed development. The Build Alternative would be required to comply with the regulations in effect at the time the grading permits are issued. Compliance with these regional programs and the Construction General Permit constitutes compliance with programs intended to address cumulative water quality impacts.

Each cumulative project would be required to develop a SWPPP or a Water Quality Management Plan (WQMP) and would be evaluated individually to determine appropriate BMPs and treatment measures to avoid impacts to surface water quality. Because the project includes BMPs to reduce pollutants of concern in runoff from the project area during construction and operation, the Build Alternative's contribution to cumulative water quality impacts is not anticipated to be substantial.

5. Avoidance and Minimization Measures

The following regulatory requirements would be implemented with the Build Alternative and would reduce or avoid impacts related to water quality:

WQ-1 The Proposed Project will comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) Order No. 2009-009-DWQ, or any subsequent permit. The project shall comply with the Construction General Permit by preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP) to address all construction-related activities, equipment, and materials that have the potential to impact water quality for the appropriate Risk Level. The SWPPP will identify the sources of pollutants that may affect the quality of storm water and include Best Management Practices (BMPs) to control the pollutants, such as Sediment Control, Catch Basin Inlet Protection, Construction Materials Management and Nonstorm Water BMPs. All work shall conform to the Construction Site BMP requirements specified in the latest edition of the Caltrans *Storm Water Quality Handbooks: Construction Site Best Management Practices Manual* to control and minimize the impacts of construction and construction-related activities, materials, and pollutants on the watershed. These include, but are not limited to, temporary sediment control, temporary soil stabilization, waste management and materials pollution control, wind erosion control, and other nonstorm water BMPs.

WQ-2 The Proposed Project will comply with the provisions of the NPDES Permit, Statewide Storm Water Permit, Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans) Order No. 2012-0011-DWQ, NPDES No. CAS000003 (Caltrans Permit) or any subsequent permit.

WQ-3 Caltrans-approved Design Pollution Prevention BMPs will be implemented to the maximum extent practicable (MEP) consistent with the requirements of the Caltrans Permit and Project Planning and Design Guide. Design Pollution Prevention BMPs include preservation of existing vegetation, slope/surface protection systems (replanting of vegetation) dikes, overside drains, and concentrated flow conveyance systems such as ditches, berms, and biofiltration swales and strips.

WQ-4 Caltrans-approved Treatment BMPs will be implemented to the maximum extent practicable (MEP) consistent with the requirements of the Caltrans Permit and Project Planning and Design Guide. Treatment BMPs may include biofiltration swales, biofiltration strips, and media filters.

WQ-5 If dewatering is required, the Proposed Project will comply with the provisions of General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality, Order No. R8-2009-0003, National Pollutant Discharge Elimination System (NPDES) No. CAG998001, as they relate to discharge of non-storm water dewatering wastes for the project. This will include submitting to the Santa Ana Regional Water Quality Control Board (RWQCB) a Notice of Intent (NOI) at least 60 days prior to the start of construction, notification of discharge at least 5 days prior to any planned discharges, and monitoring reports by the 30th day of each month following the monitoring period.

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