

APPENDIX M

List of Applicant's Best Management Practices and Agency Recommended Mitigation Measures

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BMP Number	BMP Description
A. General and Onshore	
A1	The proposed Texas GulfLink (TGL) Deepwater Port (DWP) Project would be designed, constructed, tested, operated, and maintained to conform or exceed the requirements of applicable Federal, State, and local regulations.
A2	Any deviations from agency-specified best management practices (BMP) may require Applicant and/or agency approval. BMPs are a guide and may be impractical in real world scenarios or if an alternative method is infeasible or unworkable based on Project-specific conditions or provides equal or better environmental protection.
A3	Project plans would minimize footprint and duration of disturbances. During onshore construction, the construction right-of-way and approved workspaces would be the boundary for acceptable ground disturbance, including site storage and supply components. Ground disturbing activities beyond these marked areas would require additional review to determine if there are any sensitive environmental or cultural resources. Use of any additional limited areas is subject to landowner approval and must be compliant with applicable survey and permit obligations.
A4	Onshore Construction: Within the Project construction workspaces, speed limits less than 10 mile per hour would be enforced for construction-related vehicular traffic.
A5	During onshore construction, TGL would limit access, traffic, and disturbance on the right-of-way with use of signs, fences, construction markers, survey stakes, and/or gates.
A6	A minimum of one designated Environmental Inspector (EI) would be required for the TGL Project during onshore construction and restoration. At a minimum, the EI shall be responsible for inspecting construction activities for compliance to the BMPs, environmental permits, agency mitigation prescriptions, and landowner agreements, overseeing corrective actions, identifying and monitoring areas needing special attention, ensuring proper solid and hazardous waste disposal. The EI shall have the authorization to cease activities that disturb the environmental conditions beyond the allowance of any existing permits.
A7	Pre-Construction Planning would ensure that appropriate cultural resources and wetland surveys are conducted before construction, onshore construction activities are scheduled to best minimize construction time and the duration of open trench sections, to assist in the prevention of excessive erosion or sediment flow into sensitive environmental resource areas. Per USEPA recommendations, wetlands would be surveyed and staked according to the verified wetland delineation.
A8	During construction, Horizontal direction drill (HDD) or other trenchless bore construction techniques (onshore) would be used for all road crossings. In the event of an HDD or bore being unsuccessful, the county or local highway department would be contacted to decide the best times for temporary road closures in order to minimize effects on local traffic. Roads may need to be closed during hydrostatic testing prior to HDD or boring, or for other event-driven needs. Such closures would last less than 12 hours.
A9	<p>Onshore Construction Road Crossings and Access Point BMPs:</p> <ul style="list-style-type: none"> • In order to assist with final removal of any crushed stone access pads, a fabric would be set first beneath the crushed stone. • Any crossed roadways would be cleaned daily to maintain safety for normal traffic. • Any roadway surface damage would be repaired as quickly as possible. • Used rubber tires would be placed on all asphalt roadways prior to tracked equipment crossing.

BMP Number	BMP Description
A10	During onshore construction and operations, TGL would implement plans to prevent accidental spills, leaks, and other releases of hazardous materials from equipment and vehicles that could impact onshore water quality. Spills and leaks during onshore construction would be addressed through the Construction Stormwater Pollution Prevention Plan (SWPPP). Spills and leaks during onshore operations would be addressed by measures found in the Spill Prevention, Control, and Countermeasure (SPCC) Plan; the Onshore Oil Spill Consequence Report (The Response Group 2019a); the Offshore Oil Spill Consequence Report (The Response Group 2019b); Hazardous Liquid Pipeline Operations, Maintenance, and Emergency Response Manual; and the (proprietary) TGL Operations Manual (TGL DWP Application, Volume IV, Appendix H).
A11	Offshore impacts from waste and debris during construction and operation would be minimized through development and adherence to a Waste Management Program (WMP) along with compliance with MARPOL Annex V, USCG, and USEPA regulations. TGL would continuously evaluate methods and locations for the regular collection and disposal of excess construction materials throughout construction. Any material disposal must not result in adverse environmental impacts and is subject to compliance with all landowner approvals and permit requirements.
A12	During onshore construction, TGL would minimize impacts on surface waters through implementation of its SWPPP (CK Associates 2019d) and conduct all work in accordance with a National Pollutant Discharge Elimination System (NPDES) permit (Appendix Y) for storm water and industrial waste water and would meet all provisions as provided in Texas Administrative Code (TAC) 30 TAC 305, et seq. During operation, TGL employees would be properly trained on SPCC and NPDES practices.
A13	Construction practices and off-site material storage would adhere to a SWPPP to protect rivers, lakes, wetlands, and coastal waters.
A14	The SWPPP contains specialized BMPs designed to the maximize controlled discharge into Jones Creek while minimizing sediment runoff during onshore construction (Abadie-Williams 2019c).
A15	For all properties with residents within 50 feet of work areas, onshore construction would avoid removal of mature trees, or damage to mature tree roots and landscaping when not necessary for safe operation of construction equipment, or as specified in landowner agreements. The edge of the construction work area would be fenced for a distance of 100 feet on either side of the residence. Yard areas and landscaping would be restored following cleanup operations, or as specified in landowner agreements. Temporary erosion controls would be maintained and monitored when weather conditions make compliance difficult. All residential landscaping would be restored to landowners' satisfaction.
A16	During onshore construction TGL would locate and maintain existing drain tiles and irrigation systems; repair drain tiles and irrigation systems to their original or better condition after construction.
A17	TGL would adhere to measures described in the Mitigation Plan in the TGL Section 404 Permit Application, and with State and local agencies during the permitting process to ensure wetlands are protected during construction, operation, and decommissioning of the proposed Project.

BMP Number	BMP Description
A18	All onshore construction work potentially impacting jurisdictional wetlands would be conducted in accordance with the US Army Corps of Engineers (USACE) Section 404/10 Individual Permit application (CK Associates 2019a) and Compensatory Wetland Mitigation Plan (Appendix O) for the proposed project designed to avoid, minimize, and mitigate potential impacts to wetlands. Measures including silt fences, trench plugs, revegetation, non-trench crossing methods, and reduced/minimal footprint would be employed (Abadie-Williams 2019c). A copy of the Section 404 permit would be placed at each work area. As detailed in the Compensatory Wetland Mitigation Plan (Appendix O), TGL intends to compensate for unavoidable impacts through purchase of appropriate functional credit units (FCUs) to help offset unavoidable impacts to wetlands. Should one of the proposed mitigation banks identified for use not have credits available for sale, the Applicant would develop a permittee-responsible mitigation (PRM) plan that meets the requirements of the 2008 Mitigation Rule and be made available for resource agency and public review. Per TPWD requirements, compensatory mitigation plans would contain all the required components identified under 33 Code of Federal Regulations (CFR) 332.4(c)(2) through (c)(14) in Compensatory Mitigation for Losses of Aquatic Resources (73 Federal Register 19596, April 10, 2008).
A19	Onshore construction would adhere to Regional USACE Conditions for applicable Project actions, as well as all national USACE permit conditions.
A20	In accordance with the USACE Galveston District Regional Conditions for onshore construction, no discharges would be made to Mangrove Marshes, Coastal Dune Swales, or Columbia Bottomlands. No discharges would be made within 500 feet of vegetated shallows, seagrass beds, oyster reefs, and coral reefs; as defined by 40 Code of Federal Regulations (CFR), Parts 230.43 and 230.44.
A21	During onshore construction, herbicides or pesticides would not be used in or within 100 feet (30.5 meters) of a wetland or waterbody, as practicable; mechanical control would be used instead.
A22	During onshore construction, soil compaction methods would be executed according to the conditions set by USACE Section 404 permit and the Project's SWPPP. Soil compaction would be mitigated as needed. In agricultural, residential, and wetland areas, TGL would ensure the subsoil has been recompacted and determine additional soil compaction mitigation methods in severely compacted areas. If issues with revegetation persist, the topsoil would be tested for compaction and would be restored.
A23	During onshore construction, all disturbed areas would be revegetated in accordance with the USACE Section 404 permit, landowner requests, or any other regulatory requirement. All revegetation would be monitored in accordance with USACE Section 404 permit conditions, the Habitat Restoration Plan, and the project SWPPP.
A24	During onshore construction, impacts to soil and geological resources would be minimized through mitigation including topsoil segregation, reducing soil compaction through use of timber mats (or prefabricated mats) used to track equipment where relevant (wetlands, saturated areas, and other sensitive areas) to reduce rutting or mixing of soils, revegetating and installing erosion controls, filling and grading ruts and disturbed areas (Abadie-Williams 2019c).

BMP Number	BMP Description
A25	<p>During onshore construction of pipelines, topsoil would be protected through segregation and stockpiling. Topsoil Segregation BMPs include:</p> <ul style="list-style-type: none"> • Recovered topsoil and subsoil would remain separated throughout construction activities. • Unless requested by the landowner, importation of topsoil is not an acceptable alternative to topsoil segregation. • The mixing of topsoil with subsoil would be avoided unless approved by the landowner. To prevent the mixing of soil types, the topsoil can be stripped from either the full work area or from the trench and subsoil storage area in residential areas, jurisdictional wetlands, and agricultural plots. • A minimum of 12 inches of topsoil would be required to be stripped out in designated soil segregation areas that are considered to have deep soils. In areas with less than 12 inches of topsoil, the entire topsoil layer would be stripped out as much as possible. • The length of time that topsoil is segregated and the trench is left open would be minimized as much as possible.
A26	<p>During onshore construction, the following Temporary Erosion Control BMPs would be employed:</p> <ul style="list-style-type: none"> • Post wetland disturbance sediment barriers would be set and maintained until permanent erosion controls have been implemented or relative areas have completed restoration requirements. • If trenching is proposed at a stream crossing then sediment barriers would be installed across the entire construction right-of-way as needed, to prevent the flow of sediments into the waterbody. If the right-of-way slopes toward an adjacent waterway, sediment barriers would be installed along the edge of the construction rights-of-way. • Trench plugs would also be used at open trench and water body crossings to keep trench water out of the waterbody and vice versa. • Per USEPA recommendations, monitoring is recommended during and after construction for open-cut construction methods to ensure areas are properly restored. Otherwise, mitigation should be required for stream crossings that fail to be completely restored.
A27	<p>If erosion were to occur during onshore construction, the Applicant would use silt fencing, hay bale structures, and vegetation buffers as needed. Hay bale structures would be installed by placing and staking hay bales, wedging loose straw between bales, and backfilling and compacting soil as an anchor. Vegetation buffers would be used where dense herbaceous vegetation is present and would be monitored for continued stability.</p>
A28	<p>During onshore operation of pipelines, mowing or clearing maintenance for the width of the permanent right-of-way in uplands would be conducted annually, but a centered corridor may be cleared more frequently to accommodate necessary survey work along the pipeline.</p>
A29	<p>During onshore operation of pipelines, routine vegetation mowing or clearing maintenance would be limited in wetland areas to allow a riparian strip at least 25 feet wide, as practicable, measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way.</p>
A30	<p>During onshore construction of pipelines, proper HDD or other non-trench crossing methods would be used to cross sensitive areas, such as streams, wetlands, and protected or sensitive areas.</p>

BMP Number	BMP Description
A31	Prior to non-trench pipeline installation method employment during onshore construction, underground utilities would be located and staked including exposure of utilities within 25 feet of the drill path. In addition, all-weather access points with hard stand, bentonite/slurry pit, and secondary containments would be designated along with dead-man anchorage for the drill rig (Appendix K).
A32	During onshore construction via HDD or other non-trench crossing methods, safety BMPs to minimize ground movement shall be employed, including subsidence of surface structures, while protecting the electrical conduit. Measures include proper safety orientations, tailgate safety meetings, job safety analysis, weekly safety meetings, and adherence to safety protocols (Appendix K).
A33	During water body crossing via HDD other non-trench crossing methods for onshore construction, TGL would adhere to specific HDD environmental management BMPs to prevent or contain spills of oil and hazardous substances include measures for containers, tanks, loading zones, HDD operations, emergency response, and cleanup procedures (Appendix K).
A34	In the event of an inadvertent release of drilling fluid during HDD or other non-trench method operations, TGL would implement its Appendix K, Proposed HDD Execution Plan. Vacuum trucks, booms, absorbent pads, shovels, and hay bales would be available and maintained at each trenchless method construction site for cleanup in the event of an inadvertent return.
A35	During the final stages of onshore construction and prior to being placed into service, all tanks, pipelines, and flowlines would be hydrostatically tested. Municipal or river water would be used to test tanks, then the water would be discharged to a series of stormwater features before being released via a controlled outfall (gravity fed) using a flow gate, preventing erosion and sedimentation in accordance with the NPDES permit and 40 CFR 122. Upon completion of the piping hydrostatic test, piping would be dried using warm compressed dry nitrogen or air with foam pigs until the pipeline is void of water and moisture (for both onshore and offshore pipelines).
A36	<p>During onshore construction of pipelines, TGL would follow US Fish and Wildlife Service (USFWS) recommended mitigation measures to minimize impacts to rivers, streams, and tributaries, which include:</p> <ul style="list-style-type: none"> • Schedule stream crossing construction during low streamflow months. • Construct stream crossings using gentle slopes and at right angle to flow. • Minimize disturbance of riparian and floodplain vegetation. • Limit construction equipment stream crossings to a solitary location and use an existing bridge or protective equipment pads, temporary native rock, or temporary portable bridge. • Limit in-stream equipment to equipment needed to construct the crossing. • Place trench spoil on land more than 25-feet from streambank. • When standing or flowing water is present, utilize sediment filter devices to prevent spoil movement off ROW. • Dewater trenches to prevent silty discharge into stream. • Maintain current contours of stream. • Store hazardous material more than 100-feet from streambanks. • Refuel equipment more than 100-feet from streambanks. • Revegetate with native riparian plants as soon as possible. • Maintain ROW sediment filters until vegetation reestablished. • Maintain a properly sized vegetative strip along streams and wetlands. • Direct runoff into vegetated areas.

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A37	During onshore construction, TGL would implement onshore BMPs to minimize impacts to onshore biological resources, including threatened and endangered (T&E) species, and their habitats. TGL would informally consult with the USFWS during application regarding the T&E species that may be affected by the proposed onshore project. Mitigation measures in addition to standard BMPs to minimize impacts to biological resources include limiting light, noise, and traffic; daily inspection of open trenches for trapped wildlife prior to construction operations; and adherence to species-specific surveys and BMPs (Abadie-Williams 2019c).
A38	To mitigate impacts on vegetation and potential wildlife habitat during onshore construction, TGL would restore and revegetate all areas not used for TGL onshore operations following the Habitat Restoration Plan (Appendix P). Following construction, TGL would permanently stabilize disturbed areas within the construction site by covering with crushed rock (or the equivalent) or seeding with a grass that is compatible with the climate and easily maintained. If re-seeding of the construction work areas cannot be completed immediately following construction, TGL would mulch the disturbed areas and install appropriate erosion-control devices until final restoration and seeding can be completed. Roads and parking areas that may be disturbed by construction would be re-covered with crushed rock, concrete, or asphalt.
A39	During offshore construction, TGL would implement the USFWS Standard Manatee Conditions for In-Water Work.
A40	<p>During onshore and offshore construction, mitigation measures to minimize impacts to fish and essential fish habitat (EFH) from construction, operation, and decommissioning of the proposed project include (Abadie-Williams 2019c):</p> <ul style="list-style-type: none"> • Use of the least environmentally sensitive path by avoiding oyster reefs, mud flats, and aquatic vegetation; • Unavoidable features, including the Freeport Rocks, have been identified and quantified; • Use of HDD or other non-trench method at coastal landfall to avoid coastal and estuarine resources; and • Burial and maintenance of pipelines. <p>For pipeline construction, a suitable vessel would be selected, such as a dynamic positioning barge, self-propelled barge, limiting anchor barge and/or anchor handling tug, to be used in EFH areas. The selection of vessel would be with agency consultation to reduce potential sediment disturbance on the seafloor at specific water depths due to thrust or anchor drop/drag.</p>
A41	During onshore and offshore construction, TGL would follow the recommendations of the USFWS and TPWD to take all measures possible to minimize the risk to migratory birds. TGL has agreed to use smart lighting and down-shielded lights to the maximum extent feasible.
A42	During all phases of Project development, TGL would commit to utilizing the USFWS voluntary guidelines for platform design, siting, construction, and operation to the extent that these guidelines apply to the TGL project platform. Should any platform elements exceed 200 ft above sea level, the Federal Aviation Administration would require pilot warning lights (flashing red or white strobe).
A43	During onshore construction, TGL would consult regularly with the USFWS to determine the peak bird migration periods for the site of the TGL project.

BMP Number	BMP Description
A44	<p>During onshore construction, TGL would commit to monitoring for any bird mortality consistent with any recommendations from USFWS. The survey should be rigorous enough to detect any use by migratory birds of the offshore facility and should encompass both the spring and fall migrations. Results of the fatality monitoring would be reported to the USFWS in order to assess any need for additional conservation measures that may be required to further reduce any bird fatalities.</p>
A45	<p>During onshore pipeline construction and to the extent practicable, TGL would implement the following:</p> <ul style="list-style-type: none"> • Minimize construction activities during the winter months to minimize disruptions to wintering migratory birds. • Any grading and clearing would be scheduled to occur outside the migratory bird nesting season as identified for the region by TPWD (March 15 to September 15). • Should grading or vegetation clearing activities for the terminal or onshore pipelines need to be conducted within nesting season, TGL would consult with the USFWS and TPWD to determine appropriate site-specific measures to minimize potential impacts on birds (Abadie-Williams 2019c). <p>Minimization measures may include surveys for active nests within habitat to be impacted by a qualified biologist no more than 5 days prior to clearing to identify recently constructed nests and other active nests. If active nests are found, a 150-foot vegetation buffer would be maintained around the nest until the young have fledged or the nest is abandoned.</p>
A46	<p>During onshore construction and operation, TGL would take all practicable measures to minimize the amount of total lighting used on the proposed Jones Creek Terminal to that required for safety. Additionally, the amount of light would be minimized during the height of the trans-migratory period for bird species. To reduce the disruptive effects of lighting, all lighting at the proposed Jones Creek Terminal would be down-shielded to keep the dispersion of light to a minimum. The shields would prevent the lights from shining skyward, instead directing the light to shine only on work areas.</p>
A47	<p>Based on cultural resources reviews for the proposed pipeline and Jones Creek Terminal, an Unanticipated Discoveries Plan for Cultural Resources and Human Remains for the onshore components of the proposed Project has been developed and reviewed by the Texas Historic Commission (THC) and Texas State Historic Protection Officer (SHPO) (Appendix U). During onshore construction, operation, and decommissioning personnel shall be familiar with the plan and the steps that TGL has agreed to follow in the event of the discovery of a significant cultural resource including human remains. If a potential cultural resource is encountered during construction, work would be stopped, the potential find would be protected, the THC would be notified, and the Applicant or their representative would coordinate with the THC to develop a treatment plan for the resource.</p>
A48	<p>During onshore and offshore construction, TGL commits to making reasonable efforts to avoid or minimize damage to cultural resources and to reporting the discovery of any previously unreported cultural resources to BOEM and THC as described above. TGL further commits to preliminary documentation of the cultural resource, avoidance of further damage, and cooperation with BOEM and THC to develop appropriate plans regarding the discovery.</p>
A49	<p>During onshore and offshore construction, if the proposed Project cannot avoid cultural resources identified as potentially eligible for the NRHP, then further investigations would be required to determine if these qualify as historic properties. If the cultural resources are identified as historic properties, an appropriate treatment plan would need to be developed and implemented prior to construction.</p>

BMP Number	BMP Description
A50	During onshore and offshore construction, TGL commits to evaluation of the extent of contamination, required avoidance measures and the potential impact on existing cultural resources in developing response measures to any Project-related upsets/accidents involving limited heavy hydrocarbons and debris.
A51	In the event that human remains are discovered during onshore construction, TGL commits to stopping work and following the Antiquities Code of Texas guidelines outlined in the applicable portions of Location and Discovery of Cultural Resources and Landmarks (13 TAC 26) and the Removal of Remains from an Abandoned or Unmarked Cemetery (13 TAC 22).
A52	All onshore construction, Project activities would comply with Federal, State, and local regulations to control air emissions generated by construction and operation of the proposed facilities. Exhaust emissions from vehicles engines would be minimized by Federal design standards imposed at the time of manufacture of the engines and would comply with USEPA mobile and non-road emission regulations at 40 CFR Parts 85, 86, and 89 (Abadie-Williams 2019c).
A53	During onshore construction, TGL would minimize fugitive emissions through proper piping design, good work practices, and the implementation of a program of regular inspections of all areas of the facility.
A54	Onshore construction and decommissioning air quality BMPs would include dust reduction through watering of roadways along with minimizing combustion emissions through use of commercial fuel products and minimizing equipment trips and idling time (Abadie-Williams 2019c).
A55	During onshore operation, air emissions at the proposed TGL Jones Creek Terminal would utilize BMPs and best available control technology (BACT) methods to comply with requirements under the TCEQ Non-Rule Standard Permit (NSRP) as described in their NSRP application (Abadie-Williams 2019c, Appendix C, p.1067, pp. 1121-1127).
A56	During onshore construction and operation, pipeline trenching activities would minimize soil compaction, modification, and destabilization.
A57	During decommissioning activities, construction BMPs would be followed, as well as conversion of surfaces from impervious to pervious, revegetation of riparian buffer zones, and discontinue right-of-way maintenance activities at decommissioning.
A58	Per Texas General Land Office (GLO) regulations (31 Tex. Admin. Code § 19.12) for the proposed Jones Creek Terminal operations, the Applicant would develop and implement a discharge prevention and response plan for the facility and obtain a facility certificate for the large facility classification from the GLO's Oil Spill Prevention and Response program prior to any movement of product through any part of the system. The Applicant would implement and maintain a facility discharge prevention and response plan at the facility at all times.

BMP Number	BMP Description
A59	TGL would implement measures to minimize impacts on noise receptors during construction, operation, and decommissioning. Measures to minimize impacts on noise receptors from onshore construction and decommissioning activities could include: <ul style="list-style-type: none"> • Limiting normal construction during daytime hours when there is less sensitivity to sound. • Unnecessary idling of internal combustion engines should be strictly prohibited. • All equipment should be switched off when not in use. • Properly installed mufflers should be fitted to the exhaust outlets of all combustion engines. • All equipment should be kept in good repair with all worn, loose and unbalanced machine parts to be replaced. • Locate stationary noise-generating equipment such as air compressors or portable power generators as far as possible from neighboring houses. • The use of reverse beepers should be reduced by planning haul routes and construction traffic routes so that the need to back up is minimized.
A60	In order to protect water wells during onshore construction, the Applicant would utilize temporary boundaries, including barricades and/or fencing, in addition to job planning and communication to prevent construction vehicles from entering well areas within the construction workspace.
A61	During onshore construction for any wellheads that are within the proposed permanent pipeline right-of-way, and for which the permanent right-of-way cannot be moved to avoid the wellhead, the Applicant would consult with the landowners prior to construction to determine acceptable mitigation measures that could include: <ul style="list-style-type: none"> • Closing and capping the wellhead in accordance with approved procedures by a licensed water well contractor; • Installing a new water well in a more desirable location; and/or • Providing the landowner with an alternate water source.
A62	During onshore construction, TGL would consult with the well owner/operators to avoid impact if mineral wells are present and active.
A63	TGL would implement its Unanticipated Discovery of Contamination Plan (Appendix N) if contaminated soil or groundwater were identified during construction.
A64	During the final stages of onshore pipeline construction, TGL would restore temporarily disturbed soil to pre-construction contours and conditions and implement the Habitat Restoration Plan (Appendix P) to restore workspaces affected by pipeline construction.
A65	During onshore construction, TGL would avoid paving and gravel where possible within the TGL Jones Creek Terminal site.
A66	During onshore construction, TGL would use containment berms to preserve outlying herbaceous wetland areas at the TGL Jones Creek Terminal site.
A67	During onshore construction, TGL would require contractors to include drip pans for all heavy equipment parked overnight on the Project right-of-way, terminal sites, and contractor/pipe yards.

BMP Number	BMP Description
A68	During onshore construction, the following BMPs would be followed to be protective of surface waters: <ul style="list-style-type: none"> • Secondary containment would be in place for the storage of hazardous materials in terrestrial areas; • Contractors would conduct routine inspections of tanks and other containers for leaks, • Spill response kits would be available at all secondary containment areas and on all vehicles used to transport fuel; • Fueling and transferring of liquids would be restricted to pre-designated locations away from sensitive areas such as water bodies and wetlands (BMP A36).
A69	During construction, wetland vegetation would be restored according to the Habitat Restoration Plan (Appendix P). Per USEPA recommendations, monitoring and performance standards (i.e., for vegetative cover and invasive species) for areas where no mitigation is being required for temporary impacts would be included to ensure those areas are restored to pre-construction conditions. Thresholds for noxious and invasive species in the right-of-way areas would be based on comparisons to adjacent lands. For wetland areas, a specific percent of cover (i.e., < 5%) would be established.
A70	During onshore operation, the pipeline system would be built with emergency shutdown valves at its origin and destination points and mainline block valves at other locations, which would allow crude oil to be sealed into isolatable sections in the event of a leak or rupture to minimize the effects from an accidental spill. The volume of oil spilled would be limited to the oil available in the section between valves at the time the shutdown valves are closed. A leak detection system that satisfies regulatory requirements set by PHMSA would continuously monitor all pipelines and alarm features would notify of any onshore leaks.
A71	During onshore pipeline construction the Justin Hurst Wildlife Management Area (WMA), Project construction would be conducted outside the hunting season when visitation to the WMA is low, to mitigate against impacts to recreational uses of the area.
A72	During onshore construction, the Applicant would implement measures that include the following measures to mitigate the spread of noxious and invasive species (Appendix P, Habitat Restoration Plan): <ul style="list-style-type: none"> • Complete removal of temporary fill in workspaces; and • Re-planting of forested and herbaceous workspaces.
A73	The Applicant has committed to ensuring that new and in-use compression ignition (diesel) nonroad engines would be certified according to applicable requirements of EPA's Tier 4 regulations. Similarly, should open burning of woody debris from land clearing activities be considered, the Applicant has committed to coordinating with the TCEQ to determine optimal atmospheric conditions to minimize impacts due to smoke.

BMP Number	BMP Description
B. Offshore	
B1	TGL would institute impact minimization and mitigation measures throughout the course of the proposed Project construction. TGL would implement mitigations such as, but not limited to, exclusion zones (EZ), monitoring zones (MZ), protected species observer (PSO), passive acoustic monitoring (PAM), and soft start (pile-driving) procedures. An EZ and MZ would be established based upon the activity and protected species prior to initiation of disturbing activities, allowing the PSO to enforce actions necessary to mitigate impacts to protected species. During periods of limited visibility, the PAM operator would provide real-time monitoring of acoustic and visual signals to communicate detections to the PSO. The PSO is authorized to stop and delay activities. During active pile driving operations, after the EZ has been cleared by the PSO, TGL would implement a soft start with several initial hammer strikes at less than full capacity (i.e., approximately 40–60 percent energy levels) with no less than a 1-minute interval between each strike. PSOs would be present to conduct surveys before, during, and after all pile-driving activities to monitor for marine mammals within designated EZs (CSA 2020d).
B2	During offshore construction and operation, TGL would institute the procedures described in BOEM and Bureau of Safety and Environmental Enforcement (BSEE) Notice to Lessee requirements (BOEM-NTL-No-2016-G01), which incorporates NOAA Fisheries Southeast Region guidelines for “Vessel Strike Avoidance Measures and Reporting for Mariners,” which call for vessels to maintain a vigilant watch for marine mammals and sea turtles to avoid striking protected species. All construction-related and support vessels would follow Vessel Strike Avoidance Measures when transiting to, from, and around the proposed DWP. Vessel crew members responsible for navigation duties would receive site-specific training on marine mammal sighting/reporting and vessel strike avoidance measures. The Applicant would ensure that vessel operators and crew maintain a vigilant watch for marine mammals and slow down or stop their vessels to minimize the potential for a vessel strike. TGL would adhere to the reporting procedures related to injured or dead protected species described in these guidelines (CSA 2020d).
B3	The proposed DWP would be designed and permitted under the Deepwater Port Act, and thus required to meet all lighting stipulations as noted in 33 CFR 149. During offshore operation, TGL would limit, to the greatest extent possible, the amount of total lighting used on the proposed DWP to that required for safety and navigational concerns only. As such, to reduce the disruptive effects of lighting, all lighting at the proposed DWP would be smart lighting and/or down-shielded to the greatest extent possible; reducing light dispersion to a minimum. The proposed DWP platform would employ obstruction lights on each corner, operated to flash in unison.
B4	TGL conducted a marine archeological resource assessment in 2019 for the proposed project (Abadie-Williams 2019bc). The results indicated 742 magnetic anomalies and identified 12 potential historic cultural resources along with 5 potential precontact cultural resources in the proposed project area (Abadie-Williams 2019c). During offshore construction and decommissioning, TGL would work with SEARCH to further investigate these resources in order to avoid these potential cultural resources and, if these areas cannot be avoided, further archeological investigation to fully assess and characterize these targets.
B5	During offshore construction, operation, and decommissioning, all proposed Project personnel shall be familiar with and follow the Unanticipated Discoveries Plan for Cultural Resources and Human Remains (Appendix U) in the event of the discovery of a significant cultural resource including human remains. BOEM and THC archeologists would be contacted in the event of an unanticipated underwater discovery in Federal waters and in State waters, respectively.

BMP Number	BMP Description
B6	During offshore operation, all Project-related activities would comply with Federal regulations to control the discharge of operational wastes such as bilge and ballast waters, trash and debris, and sanitary and domestic waste generated from vessels associated with the proposed Project.
B7	<p>During offshore construction, all vessels would have spill containment kits and spill response plans for use in the event of a small release. Typically, a spill response kit for a vessel other than an oil carrier must be capable of cleaning up an on-deck spill of a half-barrel or less. Pollution prevention equipment on the platform would include:</p> <ul style="list-style-type: none"> • Oil/water separator tank system; • Deck drains connected into sump systems; • Curbs, gutters, drains, and reservoirs to collect oil and contaminants not authorized for discharge by the NPDES permit; • Surge tanks for maintenance oil tank storage and surge relief storage; • Oil absorbent pads and containers for storage of oily rags; and • Loose absorbent material to absorb small spills and sealed containers for storage of contaminated material.
B8	TGL would design the two Single Point Mooring (SPM) buoys with automated as well as manual pressure relief valves that would divert oil and pressure into surge relief tanks located on the platform" to "To avoid accidental release during offshore operation, TGL would protect the two SPM buoys from pressure surges by diverting oil and pressure into surge relief tanks located on the platform
B9	During offshore operation, TGL would follow all conditions of NPDES permits for discharges associated with operation of the offshore components (Appendix Y). Operational discharges would include sanitary, reverse osmosis, bilge, and ballast water from the support boats. All permanent and intermittent discharges would require monitoring as part of the NPDES permit. Additional BMPs may be established for monitoring and sampling frequency for NPDES compliance monitoring of the support boats.
B10	During offshore construction, TGL would follow all conditions of NPDES permits for the one-time discharge for hydrostatic testing of the offshore pipelines. Offshore hydrostatic test water would utilize a USEPA-approved florescent dye. Since biocides, corrosion inhibitors, and oxygen scavengers would be added to offshore hydrostatic test waters, discharges would be treated with hydrogen peroxide and aerated during release into the Gulf of Mexico in compliance with the NPDES permit (Appendix Y); thus rendering them non-toxic. Hydrostatic testing of proposed offshore pipelines, including the outgoing pipeline and related components would be conducted in accordance with ASME B31.3 and 49 CFR Part 105.
B11	An offshore Environmental Baseline Survey (CSA 2019) conducted in March 2019 found ambient water column levels of contaminants and turbidity to be low. Proper techniques would be employed to minimize the potential introduction of toxic substances into the water column. Short-term, localized nature of elevated turbidity from seafloor disturbance, coupled with potential application of silt curtains or similar barriers in vulnerable habitats (Abadie-Williams 2019c), would minimize turbidity from construction, operation, and decommission activities.
B12	Turbidity would be monitored during offshore pipeline installation to ensure compliance with marine water quality standards (Abadie-Williams 2019c).

BMP Number	BMP Description
B13	During offshore operation, all tankers calling on the proposed DWP would be required to use approved equipment and follow and maintain records for ballast water and operational discharges (e.g., bilge, sanitary discharges) that are compliant with the International Convention for the Prevention of Pollution of Ships (MARPOL) and USCG standards. Each tanker would have an approved Ballast Water Management System. Inspections would require review of onboard records for assessing compliance (Abadie-Williams 2019c).
B14	During offshore construction, impacts from offshore waste and debris would be minimized through development and adherence to a WMP along with compliance with MARPOL Annex V, USCG, and USEPA regulations.
B15	During offshore construction, operations, and decommissioning, mitigation measures to minimize impacts to water and sediment quality would include (Abadie-Williams 2019c): <ul style="list-style-type: none"> • Monitoring of turbidity during jet sledding and direct pipe installation operations. • Routine discharges from project vessels and visiting tankers would comply with USCG regulations and NPDES permit (TGL 2020) conditions. • To minimize the introduction of alien invasive species, ballast water would also follow the International Convention for the Control and Management of Ships' Ballast Waters and Sediments.
B16	During offshore accidental events, mitigation measures to minimize impacts to water and sediment quality include secondary containment around equipment containing hydrocarbons, use of the Hazardous Liquid Pipeline Operations, Maintenance, and Emergency Response Manual; and (proprietary) TGL Operations Manual (TGL DWP Application, Volume IV, Appendix H (p.563)).
B17	To reduce air emissions during offshore construction, operation, and decommissioning, TGL would minimize air emissions from marine vessels through the operation and maintenance of vessels' engines in accordance with manufacturer recommendations (Abadie-Williams 2019c).
B18	To reduce air emissions during offshore operation, the Applicant would follow BACTs for VOC and NOx emissions from the Federal Prevention of Significant Deterioration (PSD) Permit, including compliance with MEPC.185(59) and with MEPC.1/Circ.680, 40 CFR 60 Subpart III, and 40 CFR 63 Subpart ZZZZ (CK Associates 2019b).
B19	To reduce offshore air emissions during offshore construction, TGL would prefabricate offshore components, to the extent possible, at existing onshore fabrication facilities, limiting air pollutant emissions to those from existing equipment.
B20	To reduce air emissions during offshore construction, TGL would ensure that the number of trips made by offshore marine vessels would be minimized. Mobile marine sources would be the predominant emission sources for offshore construction activities: a pipelay/derrick barge would be used for pipeline and subsea laterals, and smaller support vessels would be used to deliver material, supplies, and personnel to and from shore.
B21	During offshore construction and operation, All Project-related activities would comply with Federal regulations to control noise generated from vessels associated with the proposed Project.
B22	During offshore construction and operation, TGL would implement measures to minimize impacts on noise receptors from offshore activities including reducing vessel speed, minimizing thruster power levels, and potentially implementing mitigation measures like bubble curtains (Abadie-Williams 2019c).

BMP Number	BMP Description
B23	During offshore construction, TGL would implement various procedure measures, including "soft starts." Prior to operating at full capacity, TGL would implement a "soft start" with several initial hammer strikes at less than full capacity (i.e., approximately 40–60 percent energy levels) with no less than a 1-minute interval between each strike (CSA 2020d).
B24	During offshore construction and operation, TGL would ensure that all equipment has sound control devices no less effective than those provided by the manufacturer.
B25	To prevent or mitigate potential noise impacts on marine mammals and sea turtle species during offshore construction and operation, TGL would maintain minimal safe operating power at all times for vessels with dynamic positioning (DP) thrusters and would engage thrusters only when required. In addition, if a marine mammal or sea turtle is detected within the MZ of a DP vessel, the responsible crew member may alert the vessel operators to minimize thruster power down to the absolute lowest safe operating levels. Other vessels in the immediate vicinity of the vessel would also be instructed to reduce to slow speed and minimum safe operating power consistent with the activities being performed (CSA 2020d).
B26	Standard mitigations for marine mammal monitoring and BMPs would be in place during construction, operation, and decommissioning. Any impacts resulting from Level A or Level B noise would be addressed with an Incidental Harassment Authorization from the Applicant (CSA 2020d).
B27	During offshore construction subcontractor selection, the pre-qualification process would consider environmental capabilities and credentials of potential suppliers; suppliers with ISO14001 certification would be used where possible, critical suppliers would be required to recognize HSE Program/Policy.
B28	During offshore construction and operation and as far as reasonably practical, local suppliers would be chosen to minimize transportation.
B29	Prior to offshore construction, TGL would complete detailed pre-installation survey to minimize possibility of unexpected objects that could cause damage.
B30	During offshore construction, all pile welds would be inspected and approved through approved method to verify they are structurally adequate.
B31	During offshore pipeline construction, TGL would swab all sections of pipe prior to installation to reduce potential for scale or foreign object release, all welding operation would be in accordance to approved welding procedures, field joint coating and infill would be performed in accordance with approved procedures, burial and buckling analysis would be performed on pipeline prior to installation to ensure an efficient method is being used, and pipeline system would be hydrotested to recommended pressure to ensure no future ruptures.

BMP Number	BMP Description
B32	<p>During offshore operation, the following Good Housekeeping/Spill Avoidance BMPs would be employed:</p> <ul style="list-style-type: none"> • Train employees on good housekeeping practices • Completely drain down and use containment anytime piping is disconnected. • Keep equipment in good working order. • Repair and clean up any leaks immediately. • Ensure “hot work permits” are obtained when welding or working with an open flame or other ignition sources in controlled and well-ventilated area. • Keep work areas free of scraps and similar materials. • Store materials such as grease, paints, detergents, lube oil, hydraulic fluid in appropriate labeled containers. • Make sure all outdoor storage containers have lids and that the lids are adequately closed. • Provide adequate number of trash receptacles throughout the platform facility. • Pick up litter and other wastes including areas around platform drains to prevent blockage or plugging. • Minimize the storage age of combustible material. • Dispose of combustible waste in covered airtight, metal containers.
B33	<p>During offshore construction, TGL would ensure equipment is well maintained and inspected prior to deployment to minimize any potential leaks or loss. Equipment would be certified for use and all employees trained for proper use. Equipment use duration would be planned for efficiency.</p>
B34	<p>During offshore operation, TGL would use the following measures for use and preventative maintenance of equipment:</p> <ul style="list-style-type: none"> • A computerized maintenance management system (CMMS) to manage and track preventive maintenance activities. • Concerning purchased equipment, preventive maintenance would be carried out per the manufactures recommendation and on a frequency recommended by the manufacture. • Preventive maintenance would be performed by trained qualified personnel. • Equipment baseline would be established to better help determine when equipment approaches failure modes. • All operations check list would be updated if and when equipment is added or replaced. • Preventive maintenance plans and frequency would be evaluated as the program matures to improve the effectiveness of the equipment preventive maintenance plans.

BMP Number	BMP Description
B35	<p>During offshore operation, inspection BMPs would include:</p> <ul style="list-style-type: none"> • Daily, weekly, and monthly inspections using a prescribed check list to ensure entire facility is inspected. • Operations checklist would be reviewed by supervision to ensure the inspections are being carried out and proper information is being captured. • Operator inspections would have a focus on leaking fitting to help prevent spill before they happen. • Focusing on fittings and pipelines, offshore pipeline ROW aerial patrol would be flown by the contacted helicopter on a DOT & PHMSA required basis. The pilot and TGL employees would be OQ qualified for aerial patrol. Each aerial patrol would be documented. • TGL would have a vessel traffic controller (VTC) monitoring the radar system on a 24/7 basis. The VTC would be responsible for notifying any non-approved vessel to stay out of the TGL safety zone. If the vessel does not respond, a support boat would be dispatched to intercept the vessel.
B36	<p>During offshore operation, Employee Training BMPs would include:</p> <ul style="list-style-type: none"> • All field employees would be current in OSHA's 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training to ensure that employers follow specific work policies, practices, and procedures to protect their workers potentially exposed to hazardous substances. • Periodic emergency response drills with employee participation would take place to ensure employee know how to react to an emergency. • Employees would be trained in Spill Prevention, Control, and Countermeasures. • TGL would use an online service to ensure all contract employees are properly trained. All training records would be stored and monitored by the TGL corporate office. • Employee training plans would be evaluated on an annual basis to ensure effectiveness of the training.
B37	<p>During offshore operation, a CMMS system would track all maintenance activities and ensure they are recorded and saved on a backed-up computer server. All spills, no matter how small, would be reported.</p>
B38	<p>The proprietary TGL Operations Manual (TGL DWP Application, Volume IV, Appendix D) outlines the procedures and mitigation measures that would be in place for the proposed DWP during offshore operation, including navigational aids and establishment of approach and departure routes, Safety Zones, Areas to Be Avoided and No Anchoring Areas (selected information in TGL DWP Application, Section 148.105 (Abadie-Williams 2019a).</p>
B39	<p>If required by USCG for offshore construction, TGL would have selected construction and installation vessels make periodic very high frequency radio broadcasts advising nearby mariners of Proposed Action construction activities and navigational hazards.</p>
B40	<p>During offshore construction, TGL would communicate with the USCG, USACE, and Federal and State pilots in the region (Brazos Pilots Association, Port of Freeport Pilot Commission, and Houston Pilots Association) to provide information concerning proposed Project construction and installation activities.</p>
B41	<p>A Notice to Mariners would be issued to provide local notice of navigational hazards during installation, commissioning, and decommissioning of the Proposed Action.</p>

BMP Number	BMP Description
B42	Per GLO requirements, an estimated 10 miles of the pipeline installed within Texas state waters would be removed upon decommissioning. To minimize the area of subsea impact and duration of disturbance during decommissioning of the proposed Project, TGL would abandon the remaining subsea pipelines and other subsurface components outside Texas state waters more than 3 feet below mudline, and cut all bottom founded items such as driven pile and grouted pile anchors no shallower than 15 feet (approximately 5 meters) below mudline to avoid exposure in the future due to storms, scouring, and other uses. Final site clearance would be verified by a trawling contractor to ensure compliance with BOEM/BSEE requirements and to ensure complete removal of infrastructure.
B43	To discourage illegal dumping during construction and operation, the Applicant would follow (30 CFR § 250.300) describing measures to prevent unauthorized discharge of pollutants into the offshore waters. All equipment, tools, and containers (such as drums) would be marked with permanent identification.
B44	All vessels would be required to have a USCG-approved Vessel Response Plan, consistent with 33 CFR Part 155.
B45	The TGL DWP platform would abide by regulations in 30 CFR Part 250 ("Oil and Gas and Sulphur Operations in the Outer Continental Shelf"), 33 CFR § 151.10 ("Control of Oil Discharges"), and 33 CFR § 151.73 ("Operating Requirements: Discharge of Garbage from Fixed or Floating Platforms").
B46	<p>To respond to crude oil spills from the tanks, pipelines, and/or vessels during operation, the Applicant would respond as outlined in their Oil Spill Consequence Reports (The Response Group 2019a, The Response Group 2019b). The Applicant's Oil Spill Consequence Reports summarize and evaluate the efficacy and potential adverse environmental effects of the response measures they would undertake in all potentially affected onshore and offshore environments. The specific response measures that would be considered for each spill scenario include:</p> <ul style="list-style-type: none"> • Booming/containment; • Skimming/vacuuming; • In-situ burning • Natural recovery • Physical herding; • Use of sorbents; • Vegetation removal; • Use of emulsion-treating agents; • Use of visco-elastic and solidifying agents; • Use of dispersants; • Use of herding agents; • Manual removal; • Mechanical removal; • Nutrient microbe seeding; • Debris removal; • Use of barriers or berms; • Pressure washing; • Flooding; • Use of shoreline cleaning agents; • Steam cleaning; • Use of chemical shoreline pre-treatment; and • Sediment reworking.

BMP Number	BMP Description
B47	During offshore construction, lighting would be limited to reduce the disruptive effects of lighting, such as utilizing smart lighting and/or down-shielding.
B48	During offshore operations, the following would occur: <ol style="list-style-type: none">1. Crude oil would be submerged fill loaded into VLCCs that implement a VOC Management Plan, per the guidelines of MEPC.185(59), and the supplement MEPC.1/Circ.680, for reducing VOC emissions.2. The emergency firewater pump engine would not be operated more than 100 hours per year.3. The portal crane would only be operated when loading and unloading supplies to and from supply vessels, recovering/launching the Line boat, or relocating heavy items within the platform.4. Crude oil pipeline pigging would occur on an intermittent schedule with evaporative losses from a closed drain sump where the pig trap is drained.5. The surge tank would normally not contain crude oil, except in times of surge relief or maintenance oil collection.6. Maintenance-related sandblasting would occur for no more than 8 hours per day and a cumulative total 5 days per year (i.e., a total of 40 hours per year).