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September 13, 2019

Mr. Dwayne Johnson
U.S. Army Corps of Engineers
Galveston District, Regulatory Branch
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411-4318

Ms. Leslie Savage
Texas Railroad Commission
P.O. Box 12967
Austin, TX 78711-2967

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Carter P. Smith
Executive Director

Re: Permit Application Number SWG-2018-00789
Axis Midstream Holdings, LLC

Dear Mr. Johnson and Ms. Savage:

Texas Parks and Wildlife Department (TPWD) has reviewed the Public Notice (PN) dated August 8, 2019 for permit application number SWG-2018-00789. The applicant requests authorization to construct a series of facilities and pipelines to store, transport and load crude oil into marine transport vessels. The proposed project is located in several towns, waterways, and counties including Taft, Gregory, Ingleside, and Aransas Pass, in San Patricio County, Texas; Aransas Pass and Port Aransas in Nueces County, Texas; and the Gulf Intracoastal waterway (GIWW); Redfish Bay; Corpus Christi Ship Channel (CCSC); and Harbor Island in Nueces County, Texas. Based on the scale of adverse impacts to the important natural resources of the Redfish Bay State Scientific Area, TPWD recommends a more rigorous environmental review and consideration of alternatives in an Environmental Impact Statement.

According to the PN, the proposed project consists of the following components:

- the Midway Tank Farm (Midway Facility) located south of the City of Taft, Texas;
- a 60-acre Aransas Pass Staging Facility (Aransas Facility) located west of the City of Aransas Pass, Texas;
- a pipeline bundle connecting the Midway and Aransas Facilities consisting of one 2-inch fiber optic cable, one 6-inch gas supply (last mile), and two 36-inch crude oil pipelines;
- the Harbor Island Loading Terminal (Harbor Island Terminal) located on the west side of the CCSC on Harbor Island in Port Aransas, Texas; and
- a pipeline bundle connecting the Aransas and Harbor Island Facilities that consists of one 2-inch fiber optic cable, one 6-inch gas supply line, one 16-inch intermix return pipeline; and two 42-inch crude oil pipelines.

Current Site Conditions

The PN does not adequately describe the current site conditions of the proposed project. Please refer to the current site conditions described in the PN issued on August 20, 2019 for permit application SWG-2019-00067 for a more robust description of the significant resources that occur within the geographic area of the

proposed project. Of particular concern to TPWD is the approximately 14,000-acre Redfish Bay State Scientific Area (RBSSA) located between San Jose Island and Live Oak Peninsula. As described in TPWD's comment letter of December 6, 2018 (Attachment A), the fisheries, seagrasses, and other natural resources of Redfish Bay have ecological significance as well as scientific and educational value, reflected by the state's designation as a State Scientific Area.

The RBSSA has special status because of this designation, and the importance of seagrass habitat has since been specifically recognized by a state criminal prohibition on uprooting seagrass by propeller. As part of this special status, the policies of the Coastal Management Program, as specified in Title 31, Texas Administrative Code section 501.29, require compliance with Chapter 26 of the Texas Parks and Wildlife Code when development projects require the use or taking of any public land within a state park, wildlife management area or preserve, such as RBSSA.

Chapter 26 provides that a department, agency, political subdivision, county, or municipality of this state may not approve any program or project that requires the use or taking of public lands unless it holds a public hearing and determines that there is "no feasible and prudent alternative to the use or taking of such land," and the project "includes all reasonable planning to minimize harm to the land...resulting from the use or taking." Entities responsible for holding such hearings and making such determinations for the proposed project may include the Texas General Land Office, the Texas Railroad Commission, and/or local navigation districts, such as the POCCA or Aransas County Navigation District (see Attachment A and Attachment B for additional information).

As promulgated in Title 31 Texas Administrative Code Section 57.921, the RBSSA is established "for the purpose of education, scientific research, and preservation of flora and fauna of scientific or educational value". Based on this language, TPWD believes that the RBSSA is equivalent to a research site as defined in 40 CFR 230.54(a) and may be equivalent to a sanctuary and refuge as defined in 40 CFR 230.40(a).

Recommendation: As referenced above, USACE should evaluate the effects of the proposed project on the RBSSA in a manner consistent with all applicable definitions of state designated areas. Furthermore, if USACE issues a permit on this application, USACE should include a special condition requiring compliance with Chapter 26 of the Texas Parks and Wildlife Code.

Impacts

The PN describes the following effects of the proposed project:

- 13.94 acres of temporary impacts to waters of the U.S. to construct and install an approximately 19.5-mile-long pipeline bundle connecting the Midway and Aransas Facilities.
- 16.8 acres of permanent impacts to waters of the U.S. to construct the Aransas Facility. The PN specifically describes estuarine wetlands dominated by *Distichlis spicata* (saltgrass) and fringed with *Borrichia frutescens* (sea oxeye daisy).
- 18.58 acres of temporary trench and fill impacts to waters of the U.S. to construct and install the pipeline bundle connecting the Aransas and Harbor Island Facilities. The PN specifically identifies:
 - 7.81 acres of submerged aquatic vegetation (SAV) mainly comprised of *Halodule wrightii* (shoal grass),
 - 0.002 acres to small stands of *Spartina alterniflora* (smooth cordgrass),
 - 10.65 acres of unvegetated tidal sand flats,
 - 0.42 acre *Avicennia germinans* (black mangrove), and
 - 0.11 acre of estuarine wetlands dominated by salt grass and oxeye daisy.
- Impacts to the western littoral shoreline of Redfish Bay and the GIWW will be avoided by horizontal directionally drilling under these features.
- No impacts to waters of the U.S. are proposed to construct the Midway Facility or the upland portion of the Harbor Island Facility.
- The Harbor Island Facility would result in the dredging of 70 acres of new work material to construct vessel berths. Dredged material would be placed onsite for shoreline restoration, beneficial use (BU), and/or in a dredged material placement area.

Recommendation: TPWD requests the opportunity to review and provide comments for any habitat surveys, including survey methods, summaries, and reports, used to describe the quantitative, qualitative, and spatial attributes of the aquatic resources within the project area.

The applicant has not provided any details about the best management practices (BMPs) or restoration methods that would be used to restore the pipeline route between the Midway and Aransas Facilities.

Recommendation: In addition to the General Construction Guidelines provided in Attachment B, the applicant should implement the most recent version of the Upland Erosion Control, Revegetation, and Maintenance Plan and the Wetland and Waterbody Construction and Mitigation Procedures (i.e., Plans and Procedures) issued by the Federal Energy Regulatory Commission (FERC). Even though the proposed pipelines are not under FERC's jurisdiction, these Plans and Procedures provide a common framework of BMPs and restoration procedures that, when properly

implemented, provide assurance that the proposed temporary impacts will be temporary.

The impacts proposed within the RBSSA are described as temporary and TPWD strongly disagrees with this assessment. Open cut trenching techniques through SAV, emergent marshes, and tidal flats do not result in temporary impacts. Not only would the proposed trenching activities result in direct impacts but the proposed side-casting of dredged material would burry adjacent aquatic habitats during construction activities, especially in areas where the existing oil and gas channel is less than 150-feet-wide. Merely restoring elevations to pre-construction contours and replanting areas that were previously vegetated does not account for temporal lag or alleviate the risk and uncertainty of project success.

Previous coordination

By letter dated December 6, 2018 (Attachment A), TPWD provided the applicant's agent comments and concerns for the proposed project and information describing the importance of the aquatic habitats within the RBSSA. During this pre-application phase of the project, the applicant's agent would not disclose the specific location or layout of the Harbor Island Terminal Facility but described the proposed project as part of the "Harbor Island Project" being planned by the Port of Corpus Christi Authority (POCCA). TPWD recommended that the alternatives considered for the proposed project include those which do not require the siting of an export terminal on Harbor Island as well as those which reduce the sizes and/or numbers of pipelines routed through RBSSA. From the information provided in the PN, it is not clear if an alternatives analysis has been prepared for the proposed project.

Recommendation: If the applicant has not already done so, an alternatives analysis should be developed that includes both onsite and offsite alternatives, including but not limited to those described above. TPWD requests the opportunity to review and provide comments for the alternatives analysis.

At a subsequent Joint Evaluation Meeting (JEM), the applicant's agent stated that the route within the POCCA right-of-way (ROW) located just north of the State Highway (SH) 361 Causeway was deemed impracticable due to "constructability issues". The deepwater port project proposed by Bluewater Texas Terminal, LLC (Docket MARAD-2019-0094), which would also originate from the same Midway Facility proposed here, has since identified the POCCA's ROW as their proposed pipeline route for two 30-inch crude oil pipelines serving two single point mooring buoys located in Federal waters of the Gulf of Mexico for the purpose of fully loading very large crude carriers (VLCCs). As a result, TPWD views the POCCA ROW as a viable alternative for consideration in an alternatives analysis.

Since the pre-application phase, the following elements of the proposed project, as described in the PN, have changed within the Redfish Bay pipeline route: a 2-inch fiber optic cable has been added to the pipeline bundle, the diameter of the intermix return pipeline has increased from 12 inches to 16 inches, and the width of the work corridor across Redfish Bay has increased from 88 feet to 150 feet. These new increases in the size of the project have not been evaluated and will necessarily increase potential adverse impacts to natural resources, which should be analyzed in a more robust environmental review.

TPWD appreciates the inclusion of turbidity curtains in the PN, as recommended by TPWD.

Avoidance and Minimization:

The PN states that impacts have been avoided and minimized in part because the Harbor Island Terminal is located entirely within uplands. The cross-hatched area depicted on Sheet 33 of 39 of the project plans, however, indicates that the shoreline area along the north and northwestern edges of the proposed berthing area will not be avoided, but rather excavated. The PN does not describe these impacts.

Recommendation: Aquatic resources located within the proposed berthing area should be described, excavation impacts should be avoided and minimized to the extent practicable, and compensatory mitigation should be provided for any unavoidable impacts.

The PN states that impacts have also been avoided and minimized because the Aransas Facility is located primarily on a previously permitted industrial site. Although this site has been previously impacted by dredge and fill activities, aerial imagery available on Google Earth shows that a number of the tidal flat mosaic features that were present in the 1950's are still intact. Akin to similarly situated habitats along the Live Oak Ridge shoreline, these aquatic features likely support large numbers of waterfowl when inundated and shorebirds during periods of exposure. Because East Beasley Road already provides a direct route to the proposed facility, it is not clear why the project requires access from Farm to Market Road (FM) 140. The proposed emergency access road would partially fill the channel that provides a hydrological connection to the tidal flat mosaic described above and the tidal wetland mitigation project described below. At the roadway channel crossing, the earthen channel would be replaced by three 48-inch box culverts. There is concern that the culverts would alter site hydrology, if not at the time of installation, then later as a consequence of sedimentation and/or biofouling.

Recommendation: Onsite and offsite alternatives should be evaluated to further avoid and minimize impacts to functioning aquatic habitats. Unavoidable impacts should be compensated.

Mitigation

The PN states that pipeline installation along the southwestern shoreline of Harbor Island would require this section of the shoreline to be stabilized. Therefore, in order to compensate for unavoidable impacts to waters of the U.S., the applicant is proposing to conduct shoreline stabilization along this section of the shoreline. According to Sheet 37 of 39 of the project plans, the project would consist of 14,500 linear feet of earthen levee extending 30 feet above sea level protected by a rock breakwater extending 5 feet above sea level. The PN states that the area leeward of the shoreline project is expected to recover post-construction to form a combination of seagrass, mangrove emergent marsh habitat, but the amount of time required for recovery does not appear to be considered.

The 76-acre project is expected to protect and enhance approximately 36 acres of seagrass habitat. The PN does not quantify the net permanent impacts to special aquatic sites, including tidal flats, and waters of the U.S. that would result from the proposed shoreline stabilization project. The PN does not demonstrate that the material to be dredged from the Harbor Island Facility has been tested for contaminants or is otherwise compatible with the proposed use. Due to a lack of supply in the sediment budgets of many coastal ecosystems, TPWD generally encourages the beneficial use of dredged materials for projects which restore, enhance, or create aquatic habitats. Based on the information provided, the proposed shoreline stabilization project does not demonstrate a net gain in aquatic resource area or function and therefore does not provide adequate compensation for the proposed impacts.

In addition to the shoreline stabilization project, the applicant proposes to restore two acres of tidal wetlands by removing a levee that was constructed for a dredged material placement area (DMPA) authorized by permit number SWG-1996-02083. By depositing levee material into the onsite borrow area from which it came, site elevations would be restored to approximate pre-construction conditions. Levee removal would potentially restore tidal hydrology to an additional 8 acres of land. The PN does not indicate if the DMPA has been tested for contaminants.

Tidal Flats

The information in the PN does not accurately capture the permanent impacts the proposed project would have on tidal flats. The pipeline installation impacts to tidal flats are not only mischaracterized as temporary, but the proposed shoreline stabilization project directly and permanently impacts an even larger area of tidal flats without providing any compensation for those impacts.

Tidal flats are irregularly inundated shallow water habitats that, with the exception of algal mats, are generally unvegetated and colonized by annelid worms, dipteran larvae, small crustaceans and mollusks, and other macrobenthic infauna. When inundated, tidal flats provide escape and forage habitat to small fish as well as loafing and forage habitat to wading birds and long-legged shorebirds. When

exposed, tidal flats provide unique feeding opportunities to shorebirds in general but play a more critical role for smaller shorebirds, such as the state- and federally-listed threatened piping plover (*Charadrius melodus*) and red knot (*Calidris canutus*).

Local status and trend studies estimate that Redfish Bay has lost more than 86% of the estuarine habitats classified as tidal flat since the 1950's (Tremblay et al. 2008, White and Tremblay 1998). Much of that loss has occurred on the islands separating Redfish Bay from Aransas and Corpus Christi Bays and along navigation channels between Harbor Island and the GIWW. While many of these losses are attributed to habitat conversions caused by sea level rise, losses along the east margin of Live Oak Ridge have also been attributed to industrial development along the GIWW. Upland development accounted for as much as 43% of the long-term tidal flat loss. Channelization of the GIWW contributed to another 31% loss of tidal flats to open water, which in turn allowed emergent vegetation to establish in remaining flats accounting for 23% of the long-term gross loss.

Recommendation: Because TPWD is not aware of any successful tidal flat restoration techniques or successful tidal flat restoration projects, tidal flat habitats are considered difficult to replace. Therefore, impacts to tidal flats should be avoided and minimized to the extent possible.

Overall, TPWD has concern for the significant individual effects of the proposed project, as well as the cumulative effects of past and reasonably foreseeable future projects, may have on:

- the physical, chemical, and biological characteristics of the aquatic ecosystem (including suspended particulates and turbidity, water quality, normal water fluctuations, threatened and endangered species and their habitats, aquatic organisms in the food web, and other wildlife associated with aquatic ecosystems),
- the significant permanent and unmitigated impacts to special aquatic sites that would result from the project as proposed, and
- the adverse effects on the human use characteristics of these special aquatic sites (including recreational and commercial fisheries, water-related recreation, aesthetics, and preserves such as research sites that are managed for their aesthetic, educational, historical, recreational, or scientific value).

As shown in public notices and news reports, TPWD is aware of several other development projects proposed in this area that should be considered as part of an analysis of cumulative effects.

Recommendation: Prior to the issuance of a permit, the applicant should incorporate the above requested modifications and then submit revised project plans for resource agency review. In addition, an Environmental Impact Statement should be undertaken to fully evaluate:

- the alternatives that were considered when selecting the preferred alternative,
- the direct, indirect and cumulative impacts of the proposed project on the environment including the significant aquatic resources of Redfish Bay and the RBSSA, and
- a compensatory mitigation plan that fully offsets all unavoidable impacts.

TPWD appreciates the opportunity to provide comments and recommendations for this project. Questions can be directed to Ms. Jackie Robinson (361-825-3241) or Ms. Leslie Koza (361-825-2329) in Corpus Christi.

Sincerely,



Robin Riechers
Director
Coastal Fisheries Division

RR:JR:LK:dh

Attachments

cc: Ms. Jackie Robinson
Ms. Leslie Koza

Literature Cited:

- Tremblay, T.A., J.S. Vincent, and T.R. Cabian. 2008. Status and trends of inland wetland and aquatic habitats in the Corpus Christi area. Coastal Bend Bays and Estuary Program, CBBEP - 55, 89 pp.
- White, W.A. and T.A. Tremblay. 1998. Current status and historical trends of selected estuarine and coastal habitats in the Corpus Christi Bay National Estuary Program study area. Corpus Christi Bay National Estuary Program. CCBNEP-29, 161 pp.



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December 6, 2018

Mr. Richard G Leonhard
Project Consulting Services, Inc.
3300 W. Esplanade Avenue South, Suite 500
Metairie, LA 70002

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Carter P. Smith
Executive Director

RE: Axis Midstream
Redfish to Harbor Island Pipelines

Dear Mr. Leonhard:

As indicated at the Joint Evaluation Meeting (JEM) on October 2, 2018, hosted by the U.S. Army Corps of Engineers (USACE) Corpus Christi Regulatory Field Office, the Texas Parks and Wildlife Department (TPWD) is providing written comments and concerns for the proposed project. TPWD greatly appreciates this timely coordination effort so that information about potential impacts to fish and wildlife resources, as well as recommendations to avoid and minimize those impacts, can be provided and taken into consideration during the early stages of project development.

As proposed at the JEM, the project would consist of two 42-inch pipelines for exporting crude oil, one 12-inch backflow pipeline for maintenance, and one 6-inch gas pipeline for power. As explored for 14 alternative routes, the pipeline route would begin at an existing crude gathering facility in Aransas Pass in San Patricio County, Texas and terminate at an unidentified export terminal on Harbor Island. The majority of these routes would pass through Redfish Bay and the designated Redfish Bay State Scientific Area (RBSSA). Of the alternatives presented, three routes remain under consideration, including a route through the Port of Corpus Christi Authority's (PCCA) right-of-way (ROW) that runs along the northern shoreline of State Highway (SH) 361 and two routes that cross through southern Redfish Bay between SH 361 and the Corpus Christi Ship Channel (CCSC).

Axis Midstream's presented preferred route, which crosses southern Redfish Bay just south of Ransom Island, would avoid and minimize the first 4,500 feet of impacts by horizontally directionally drilling (HDD) under the Aransas Pass shoreline, the Gulf Intracoastal Waterway (GIWW), and adjacent seagrass beds and shallow water habitats. The remainder of the route would employ conventional trenching techniques through approximately 6,000 feet of existing oil and gas channels, approximately 6,500 feet of open waters in Redfish Bay, and upon approaching Harbor Island, up to 7,600 feet of seagrass and other shallow water habitats. Trenching techniques would require an approximately 44-foot-wide trench, with an adjacent corridor measuring approximately 44-feet-wide for the placement of side casted dredged material. According to the impact calculations provided, the project would directly affect approximately 13.1 acres of existing oil and gas channels, approximately 14.2 acres of open water, and approximately 16.6 acres of shallow water resources, including seagrasses. Estimates of indirect impacts, such as those resulting from turbidity, have not been provided.

Seagrasses play critical roles in the coastal environment by providing nursery habitat for estuarine fisheries, serving as a major source of organic biomass for coastal food webs, contributing to the stabilization of shorelines and sediments to reduce coastal erosion and improve water clarity, as well as contributing to nutrient cycling and water quality processes. Redfish Bay represents the most extensive area of pristine seagrass beds outside the Laguna Madre and is also the northern range limit for large beds of turtlegrass and manatee grass (Pulich and Calnan, 1999)¹.

The importance of these shallow water resources to recreational fisheries in Redfish Bay is evidenced by recent angler survey data collected from 2013 to 2017. Southern Redfish Bay (as defined above) represents only about 7% of the areal extent of the Corpus Christi Bay Ecosystem, yet survey data indicate that this small area accounted for 18% of the angling trips taken by boat and 21% of the angler hours (time anglers spent fishing) throughout the Corpus Christi Bay Ecosystem. These survey data also indicate that southern Redfish Bay accounted for 37% of spotted seatrout, 31% of red drum, 23% of southern flounder, and 12% of black drum landed throughout the Corpus Christi Bay Ecosystem.

Following a multi-agency effort and the resulting publication of the “Seagrass Conservation Plan for Texas” in 1999, the Texas Parks and Wildlife Commission established the RBSSA for the purpose of education, scientific research, and preservation of flora and fauna of scientific or educational value (i.e., seagrass meadow communities). Because of this designation, the RBSSA has special status, and the importance of seagrass habitat has since been specifically recognized by state law, not just within the RBSSA, but state-wide. As part of this special status, the policies of the Coastal Management Program as specified in Title 31, Texas Administrative Code, section 501.29 require compliance with Chapter 26 of the Texas Parks and Wildlife Code when development projects require the use or taking of any public land within a state park, wildlife management area or preserve, such as RBSSA.

Chapter 26 provides that a department, agency, political subdivision, county, or municipality of this state may not approve any program or project that requires the use or taking of public lands unless it holds a public hearing and determines that there is “no feasible and prudent alternative to the use or taking of such land,” and the project “includes all reasonable planning to minimize harm to the land resulting from the use or taking.” Entities responsible for holding such hearings and making such determinations for the proposed project may include the Texas General Land Office, the Texas Railroad Commission, and/or local navigation districts, such as the PCCA or Aransas County Navigation District.

TPWD understands that habitat surveys have not been performed and that the calculated impacts are currently based on desktop estimates. TPWD recommends that habitat surveys be conducted, preferably during the growing period (March – October), so that the entire suite of project impacts can be adequately quantified.

Storage tanks and an export terminal were identified among the infrastructure that would be required to fulfill the basic purpose and need of the proposed project. However, details related to these components have not been provided. To fully evaluate potential impacts

Mr. Richard G. Leonhard
Axis Midstream; Redfish to Harbor Island Pipelines
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to fish and wildlife resources, all components of the proposed project should be included in the proposed project plans, and all direct and indirect impacts to each aquatic resource type should be quantified.

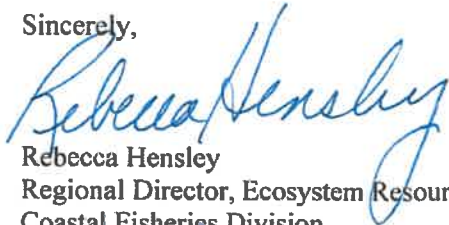
To ensure that impacts to aquatic resources are avoided and minimized to the extent practicable, an alternatives analysis should include project alternatives that do not require the siting of an export terminal on Harbor Island. Alternatives that reduce the sizes and/or numbers of pipelines routed through RBSSA should also be considered, as well as including additional HDD segments to reduce both direct and indirect impacts.

With respect to the use of turbidity curtains, TPWD continues to recommend their use as a best management practice (BMP) to minimize turbidity, which is known to cause secondary impacts to seagrass beds. This BMP is widely used throughout the state, and TPWD is not aware of any data that supports the assertion made at the JEM that this BMP does not work when properly installed and maintained.

Based on the information provided, TPWD believes that the PCCA ROW route may result in fewer impacts to fish and wildlife resources than the preferred route but may not represent the least damaging practical alternative. Such a determination would need to be made by divisions of the state that would authorize such a project through the RBSSA, but only after the consideration of public comments.

Again, TPWD appreciates the opportunity to provide information about fish and wildlife resources and recommendations that avoid and minimize impacts to those resources. We look forward to continuing this coordination effort, and please feel free to contact Ms. Jackie Robinson (361-825-3241) or Ms. Leslie Koza (361-825-2329) in Corpus Christi for any questions you may have as this process moves forward.

Sincerely,



Rebecca Hensley
Regional Director, Ecosystem Resources Program
Coastal Fisheries Division

RH:LK:JR:lam

cc: Ms. Emily Edwards, U.S. Army Corps of Engineers, Corpus Christi, Texas

¹ Pulich, W.M., Jr. and T. Calnan (eds.). 1999. Seagrass Conservation Plan for Texas. Resource Protection Division. Austin, Texas: Texas Parks and Wildlife Department. 79 pp.

Attachment B

Supplemental Recommendations and Information for Permit Application SWG-2018-00789 September 13, 2019

General Construction Recommendations

Recommendation: In general, for construction activities in uplands, TPWD recommends the judicious use and placement of sediment control fence to exclude wildlife from areas to be disturbed. In many cases, sediment control fence placement for the purposes of controlling erosion and protecting water quality can be modified minimally to also provide the benefit of excluding wildlife access to construction areas. The exclusion fence should be buried at least six inches and be at least 24 inches high. The exclusion fence should be maintained for the life of the project and only be removed after the project activities are completed and the disturbed sites have been revegetated or otherwise stabilized. Construction personnel should be encouraged to examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities. Regarding pipeline installation and HDD entry pits, TPWD recommends that any open trenches or deep excavation areas be covered overnight and/or inspected every morning to ensure no wildlife species have been trapped. For open trenches and excavated areas, escape ramps should be installed at an angle of less than 45 degrees (1:1) in excavated areas that will allow trapped wildlife to climb out on their own. If any state-listed species are trapped in trenches or excavated areas, they should be removed by personnel permitted by TPWD to handle state-listed species.

Recommendation: For soil stabilization and/or revegetation of disturbed areas within the proposed project area's upland sections, TPWD recommends utilizing erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife, TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding due to a reduced risk to wildlife. If erosion control blankets or mats would be used, the product should contain no netting or contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic mesh matting should be avoided.

Impacts to Terrestrial Vegetation and Wildlife Habitat

The upland component of the proposed project consists of a mixture of habitat types and vegetation communities mapped as agricultural land (row crops), coastal prairie, salty prairie, deep sand grassland, mesquite mixed shrubland, huisache woodland or shrubland, deep sand live oak shrubland, and deep sand live oak forest and woodland. In general, current and past vegetation clearing can be a significant threat to native plant communities in an area because disturbed areas are often revegetated with invasive, introduced species.

Recommendation: To the greatest extent practicable, TPWD recommends avoiding and/or minimizing clearing native woody vegetation and native herbaceous communities (e.g., native grasslands) to construct new access roads or to accommodate heavy

equipment access to project sites. Wherever possible, TPWD recommends locating new access roads in previously disturbed areas, including previously cleared right-of-ways (ROWs), utility corridors, etc., or improving existing roads (e.g., private farm and ranch roads). Material and equipment staging areas should be located within previously disturbed areas that do not require vegetation clearing.

A portion of the upland pipeline crosses live oak shrubland and live oak forest-woodland habitat (e.g. between MP 16 and 19). Impacts to native uplands would be expected to be long-term (> 6 months to recover).

Recommendation: TPWD recommends that established pipeline and utility corridors and previously disturbed areas be used wherever possible. However, in order to preserve a special vegetation community unique to the Live Oak Peninsula, when installing the pipeline through live oak forest, woodland or shrubland habitat on the Live Oak Peninsula, TPWD recommends narrowing the construction ROW to a width of 100 feet. Impacts to the live oaks in this area, many of which are hundreds of years old, will not recover within several growing seasons thus resulting in permanent impacts. Narrowing the construction corridor would assist in minimizing permanent impacts to this unique habitat.

Colonization by invasive species, particularly invasive grasses and weeds, should be actively prevented. Vegetation management should include removing invasive species early on while allowing the existing native plants to revegetate disturbed areas.

Recommendation: TPWD recommends referring to the Lady Bird Johnson Wildflower Center Native Plant Database (available online) for regionally adapted native species that would be appropriate for post-construction landscaping of disturbed areas. For herbaceous revegetation efforts, TPWD recommends the exclusive use of a mixture of native grasses and forbs. While some introduced grasses that may be presently growing in or adjacent to the project areas can provide suitable forage for livestock and some species of wildlife with proper management, introduced species typically develop into monotypic stands of vegetation that do not provide high quality grassland habitat able to support a diversity of wildlife species. TPWD recommends that native grasses having the same desirable characteristics as introduced grasses commonly used in revegetation plans be incorporated into project planning and implemented following construction.

State Regulations

Parks and Wildlife Code

Nongame Birds

State law prohibits any take or possession of nongame birds, including their eggs and nests. Laws and regulations pertaining to state-protection of nongame birds are contained in Chapter 64 of the Texas Parks and Wildlife (TPW) Code. This protection applies to most native bird species, including ground nesting species. Although not documented in the Texas Natural Diversity

Database (TXNDD), many bird species which are not listed as threatened or endangered are protected by Chapter 64 of the TPW Code and are known to be year-round or seasonal residents or seasonal migrants through the proposed project area.

During the winter, south Texas is the southernmost limit for many migratory birds and it is the northernmost extreme in the breeding season (spring-summer) for other species. Additionally, the proposed project area is in the middle of the Central Migratory Flyway through which millions of birds pass during spring and fall migration. Available food, cover, and water sources provide important stopover habitats for Neo-tropical migrants.

Biologically, this area of south Texas is highly productive and provides a range of habitats including large tracts of undeveloped land, grasslands, prairies, woodlands, marsh, and aquatic habitats. The diversity of habitats is suitable to support a diversity of wildlife species. In particular, the range of habitats provides cover, feeding, nesting and loafing areas for many species of birds; grassland birds, Neo-tropical migrants, shorebirds, wading birds, and raptors.

Recommendation: The proposed project is located in a region with very diverse habitats that are within the range and suitable habitat for many rare species and migratory birds. Any vegetation clearing (or ground disturbance that would impact ground nesting birds) that would be required to construct the uplands, inshore or offshore infrastructure (tank farm, pipelines, terminal, horizontal directional drilling (HDD) entry/exit pits), improve existing access roads, or create new access roads should be scheduled to occur outside of the March 15-September 15 migratory bird nesting season. Contractors should be made aware of the potential of encountering non-game migratory birds (either nesting or wintering) in the proposed project site and be instructed to avoid negatively impacting the birds.

If vegetation clearing or ground disturbance must be scheduled to occur during the nesting season, TPWD recommends the areas to be impacted should be surveyed for active nests by a qualified biologist. Nest surveys should be conducted no more than five days prior to the scheduled clearing to ensure recently constructed nests are identified. If active nests are observed during surveys, TPWD recommends a 150-foot buffer of vegetation/undisturbed area remain around the nest until the young have fledged or the nest is abandoned.

State-listed Species

State law prohibits the capture, trap, take or kill (incidental or otherwise) of state-listed species. Laws and regulations pertaining to state-listed endangered or threatened animals are contained in Chapters 67 and 68 of the TPW Code; laws pertaining to endangered or threatened plants are contained in Chapter 88 of the TPW Code. There are penalties, which may include fines and/or jail time in addition to payment of restitution values, associated with take of state-listed species. A copy of TPWD Guidelines for Protection of State-Listed Species, which includes a list of penalties for take of species, can be found on the TPWD website.

For purposes of relocation, surveys, monitoring, and research, terrestrial state-listed species may only be handled by persons permitted through the TPWD Wildlife Permits Program. For more information regarding Wildlife Permits, please contact the Wildlife Permits Office at (512) 389-4647. For the above-listed activities that involve aquatic species please contact the TPWD Kills and Spills Team (KAST) for the appropriate authorization.

The potential occurrence of state-listed species in the project area is primarily dependent upon the availability of suitable habitat. Direct impacts to high quality or suitable habitat therefore are directly proportional to the magnitude and potential to directly impact state-listed species. State-listed reptiles that are typically slow moving or unable to move due to cool temperatures are especially susceptible to being directly impacted during vegetation clearing for roads, staging areas, easements, or machinery access corridors.

Please be aware that determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence.

Recommendation: TPWD recommends reviewing the most current TPWD annotated county lists of rare species for Nueces and San Patricio counties, as rare species could be present depending upon habitat availability. These lists are available online at the TPWD Wildlife Diversity website. Major revisions were made to these lists in April 2019.

The Texas Natural Diversity Database (TXNDD) contains records of rare species occurrences throughout the proposed project area.

Recommendation: Please note that the TXNDD is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Absence of information in an area does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presences, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and cannot be used as presence/absence data. They represent species that could potentially be in your project area. This information cannot be substituted for on-the-ground surveys. The TXNDD data is updated continuously based on new, updated and undigitized records; therefore, TPWD recommends requesting the most recent TXNDD data on a regular basis.

Aquatic Resources

Dewatering, maintenance, and construction related activities in aquatic habitats including streams, channels, bays and estuaries may negatively impact fish, shellfish, and other aquatic

resources. As the state agency with the primary responsibility for protecting the state's fish and wildlife resources, the TPW Code authorizes the Department to investigate fish kills and any type of pollution that may cause loss of fish or wildlife resources, estimate the monetary value of lost resources, and seek restitution or restoration from the party responsible for the fish kill or pollution through suit in county or district court. The TAC requires the department to actively seek full restitution for and/or restoration of fish, wildlife, and habitat loss occurring as a result of human activities. The restitution value of lost resources can be significant, in particular for species classified as threatened or endangered. Restitution for each individual of a threatened species is at least \$500 and for each individual of an endangered species is at least \$1,000. In addition, the TPW Code makes it a criminal offense to kill any fish or wildlife resources classified as threatened or endangered.

Recommendation: Because the project would require work within aquatic habitats, the project may need to be coordinated with the TPWD KAST for appropriate authorization and to ensure protection of aquatic wildlife.

Lighting

Lighting may be required during construction and operation of the proposed facilities. Presumably, lighting would be installed at the Midway, Aransas and Harbor Island Facilities and would be used for safety and security.

Recommendation: Particularly for onshore facilities, TPWD recommends considering appropriate lighting technologies and best management practices described at the International Dark-Sky Association website. Specifically, security lighting within any fenced compounds should be fully down-shielded and directed away from vegetation outside of fenced areas. Security lighting around on-ground facilities should also be motion- or heat-sensitive to eliminate constant nighttime illumination. For lighting over the water, lights should be shielded to eliminate both skyward and water surface illumination (which can attract fishes and invertebrates).