

# **AXIS MIDSTREAM PARTNERS, LLC**



Axis Midstream

## **Field Review Report**

**Midway to Harbor Island Pipeline Project  
Nueces and San Patricio Counties, Texas**

**Prepared By:**





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## 1.0 INTRODUCTION

### 1.1 Background and Location

Project Consulting Services, Inc. (PCS) was contracted by Axis Midstream Partners, LLC (Axis) to perform a desktop evaluation in accordance with Part IV: Section D (Routine Determinations) of the 1987 Corps of Engineers Wetlands Delineation Manual (TR Y-87-1) on the Midway to Harbor Island Pipeline Project in Nueces and San Patricio Counties, Texas. The purpose of the evaluation was to document the potential for Clean Water Act (CWA) permitting for various segments within the Van System. Based on those findings, field verification of identified segments was carried out in accordance with TR Y-87-1 to document any potentially jurisdictional wetlands and/or water bodies subject to Clean Water Act (CWA) or Rivers and Harbors Act (RHA) regulation within the Survey Area. Data on the preliminary pipeline location was provided by Axis. A vicinity map depicting the Sites is included in **Appendix A, Figure 1**.

**CWA jurisdictional wetlands:** Observations were made and data collected on hydrology, vegetation, and soils to determine presence or absence of wetlands in the Survey Area(s).

- ❖ Wetland hydrology includes all hydrologic characteristics of areas that are continuously inundated or have soils saturated to the surface for 5% of the growing season. (Environmental Laboratory 1987).
- ❖ Hydrophytic vegetation is defined as “*the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present*” (Environmental Laboratory 1987). When 50% or greater of the dominant plant species at a site are plants adapted for life in wet conditions, hydrophytic vegetation is present.
- ❖ Hydric soils are defined as soils that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil. (USDA National Technical Committee for Hydric Soils 2016).

**RHA jurisdictional waters:** Observations were made for the presence or absence of traditionally navigable waters (TNW), and relatively permanent waters (RPW) and non-relatively permanent waters (non-RPW) with a significant nexus to TNW.

**Title 33, Section 328.4 I 1** of the Code of Federal Regulations (CFR) defines the lateral limit of jurisdiction in non-tidal waters as the ordinary high-water mark (OHWM), provided the jurisdiction is not extended by the presence of wetlands.

### 1.2 Site Characterization

A review of topographic maps indicates that elevations range from approximately 15 feet at the Midway Tank Farm to 5 feet above mean sea level at the Redfish Facility and Harbor Island Terminal. A portion of the Project is situated within Aransas Bay (**Appendix A, Figure 2**).

The Site is situated within the Aransas (12100407, Aransas Bay (12100405 and North Corpus Christi Bay (12110201) Sub-Basins (**Appendix A, Figure 1**). The Project crosses tributaries of Gum Hollow, McCampbell Slough and several other man-made drainage features.





The Site is located within the Mid-Coast Barrier Islands and Coastal Marshes and Southern Sub-Humid Gulf Coastal Prairies ecoregions of the Western Gulf Coastal Plain. The Western Gulf Coastal Plain is a relatively flat grassland situated adjacent to the Gulf of Mexico. This area has been affected by agriculture (e.g. cropland or pasture), residential, and commercial activities. The Mid-Coast Barrier Islands and Coastal Marshes are comprised of dunes, beaches, bays, estuaries, tidal marshes and barrier islands. The vegetation in this ecoregion is comprised primarily of cordgrass (*Spartina spp.*), saltgrass (*Distichalis sp.*), bluestems (*Andropogon spp.*) and 4aspalum (*Paspalum spp.*). The Southern Sub-Humid Gulf Coastal Prairies are comprised of low flat plains of coastal prairies. The vegetation is dominated by a variety of grasses. There are some scattered areas of oaks (*Quercus sp.*) and some thorn-shrub (i.e. honey mesquite, huisache, etc.).

The Survey Area consists of agricultural lands, scrub shrub areas, riparian, freshwater and intertidal marsh habitats. The NWI maps the majority of the Site as upland. The Site contains estuarine deep-water (*E1*), estuarine intertidal (*E2EM*), lacustrine littoral (*L2*), palustrine emergent (*PEM*), palustrine (freshwater) ponds (*PUB*), and riverine lower perennial (*R2*) habitats. These habitats are associated with the various streams and the floodplain found within the Project area (**Appendix A, Figure 3**).

Numerous soils are mapped by the Natural Resources Conservation Service (NRCS) within the Project area. This data is presented in **Table 1**. The NRCS soils map is included in **Appendix A, Figure 4**.

**Table 1: NRCS Mapped Soils within the Project Area**

Map Unit Symbol	Map Unit Name	Drainage Class Rating	Hydric Soil Rating* (major component)
As	Aransas clay, 0 to 1 percent slopes, slightly saline, moderately sodic, frequently flooded	Poorly drained	Hydric
Ds	Dianola soils	Poorly drained	Hydric
Dt	Dietrich loamy fine sand, 0 to 1 percent slopes, very rarely flooded	Poorly drained	Hydric
Ec	Banquete clay, 0 to 1 percent slopes	Moderately well drained	Non-Hydric
GM	Galveston-Mustang complex, 0 to 3 percent slopes, occasionally flooded, frequently ponded	Moderately well drained to Poorly drained	Hydric
Is	Ijam soils, rarely flooded	Poorly drained	Hydric
Mu	Mustang fine sand, 0 to 1 percent slopes, occasionally flooded, frequently ponded	Poorly drained	Hydric
Na	Narta loam, 0 to 1 percent slopes, rarely flooded	Poorly drained	Hydric



Nu	Nueces fine sand	Moderately well drained	Non-Hydric
<b>Map Unit Symbol</b>	<b>Map Unit Name</b>	<b>Drainage Class Rating</b>	<b>Hydric Soil Rating (major component)</b>
Or	Orelia fine sandy loam, 0 to 1 percent slopes	Well drained	Non-Hydric
Os	Calallen sandy clay loam, 0 to 1 percent slopes	Well drained	Non-Hydric
PaA	Papalote fine sandy loam, 0 to 1 percent slopes	Moderately well drained	Non-Hydric
RaA	Raymondville clay loam, 0 to 1 percent slopes	Moderately well drained	Non-Hydric
RaB	Raymondville clay loam, 1 to 3 percent slopes	Moderately well drained	Non-Hydric
Ta	Tidal flats, occasionally ponded	Very Poorly drained	Hydric
VcA	Victoria clay 0 to 1 percent slopes	Well drained	Non-Hydric
Vd	Victoria clay, depressional	Well drained	Non-Hydric
WfA	Willacy fine sandy loam, 0 to 1 percent slopes	Well drained	Non-Hydric

The Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) shows the pipeline route to cross several tracts within the 100-year flood plain as well as a floodway north of Hwy. 1609 in San Patricio County (**Appendix, Figure 5**).

Average yearly rainfall for Port Aransas, Texas is 34.76 inches. The 2018 rainfall total for the month of November was 0.25 inches. The rainfall total for the fourteen days preceding the site visit was 0.0 inches.

## **2.0 METHODS**

### **2.1 Preliminary Desktop Review**

PCS conducted a desktop review of the Survey Area to identify certain features indicative to the presence of wetlands and/or other waters. The desktop review also was used to assist in determining the presence/absence of a significant nexus to a TNW which is used to determine the jurisdictional nature of any observed features. Sources used to complete the review include:

- ❖ U.S. Geological Survey (USGS): 7.5-minute topographic quadrangles,



- ❖ National Agriculture Imagery Program (NAIP): 2015 1m natural color digital aerial imagery,
- ❖ U.S. Department of Agriculture Watershed Data: 2016 Aransas (12100407), Aransas Bay (12100405) and North Corpus Christi Bay (12110201), Texas,
- ❖ U.S. Fish and Wildlife Service (USFWS): NWI data,
- ❖ NAIP: 2004 1m Color-Infrared digital aerial imagery,
- ❖ NRCS: Soil Surveys for Nueces and San Patricio Counties, Texas and
- ❖ FEMA Floodplain Data.

A review of topographic maps indicates that elevations range from approximately 15 feet at the Midway Tank Farm to 5 feet above mean sea level at the Redfish Facility and Harbor Island Terminal. A portion of the Project is situated within Aransas Bay (**Appendix A, Figure 2**).

The Site is situated within the Aransas (12100407, Aransas Bay (12100405 and North Corpus Christi Bay (12110201) Sub-Basins (**Appendix A, Figure 1**). The Project crosses tributaries of Gum Hollow, McCampbell Slough and several other man-made drainage features.

The Site is located within the Mid-Coast Barrier Islands and Coastal Marshes and Southern Sub-Humid Gulf Coastal Prairies ecoregions of the Western Gulf Coastal Plain. The Western Gulf Coastal Plain is a relatively flat grassland situated adjacent to the Gulf of Mexico. This area has been affected by agriculture (e.g. cropland or pasture), residential, and commercial activities. The Mid-Coast Barrier Islands and Coastal Marshes are comprised of dunes, beaches, bays, estuaries, tidal marshes and barrier islands. The vegetation in this ecoregion is comprised primarily of cordgrass (*Spartina spp.*), saltgrass (*Distichalis sp.*), bluestems (*Andropogon spp.*) and paspalum (*Paspalum spp.*). The Southern Sub-Humid Gulf Coastal Prairies are comprised of low flat plains of coastal prairies. The vegetation is dominated by a variety of grasses. There are some scattered areas of oaks (*Quercus sp.*) and some thorn-shrub (i.e. honey mesquite, huisache, etc.).

The Survey Area consists of agricultural lands, scrub shrub areas, riparian, freshwater and intertidal marsh habitats. The NWI maps the majority of the Site as upland. The Site contains estuarine deep-water (*E1*), estuarine intertidal (*E2EM*), lacustrine littoral (*L2*), palustrine emergent (*PEM*), palustrine (freshwater) ponds (*PUB*), and riverine lower perennial (*R2*) habitats. These habitats are associated with the various streams and the floodplain found within the Project area (**Appendix A, Figure 3**).

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Map Unit Symbol	Map Unit Name	Drainage Class Rating	Hydric Soil Rating (major component)
Dt	Dietrich loamy fine sand, 0 to 1 percent slopes, very rarely flooded	Poorly drained	Hydric
Ec	Banquete clay, 0 to 1 percent slopes	Moderately well drained	Non-Hydric
GM	Galveston-Mustang complex, 0 to 3 percent slopes, occasionally flooded, frequently ponded	Moderately well drained to Poorly drained	Hydric
Is	Ijam soils, rarely flooded	Poorly drained	Hydric
Mu	Mustang fine sand, 0 to 1 percent slopes, occasionally flooded, frequently ponded	Poorly drained	Hydric
Na	Narta loam, 0 to 1 percent slopes, rarely flooded	Poorly drained	Hydric
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The Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) shows the pipeline route to cross several tracts within the 100-year flood plain as well as a floodway north of Hwy. 1609 in San Patricio County (**Appendix, Figure 5**).

Average yearly rainfall for Port Aransas, Texas is 34.76 inches. The 2018 rainfall total for the month of November was 0.25 inches. The rainfall total for the fourteen days preceding the site visit was 0.0 inches.

## 2.2 Data Collection and Mapping

PCS scientists geographically referenced data points and feature boundaries within the Survey Area using a Trimble Geo7X global positioning system differentially corrected to one-meter accuracy. Geographic Information Systems and Post-Processing software were used to examine the collected data, calculate feature size and produce report figures. Report figures are shown in **Appendix A**.

At each Intersection Point, hydrology, vegetation and soils were examined for wetland characteristics. An Intersection Point must contain wetland vegetation, hydric soils, and wetland hydrology in order to be considered a wetland. If any one of these three characteristics is missing, the Intersection Point is not within a wetland.

## 3.0 DATA

In total, thirty-six (36) sample locations (Plots) were examined within the Project Area. Where applicable, one observation was made in wetlands and one was made in uplands discerning the wetlands boundary at each of the observed wetlands.

**Table 2** summarizes observations made at each Plot. Data sheets, photo log and a plant list are included in **Appendix B**. A data validation table is included in **Appendix C**.

**Table 2: Midway to Harbor Island Pipeline Project Data Point Summary**

Data Point Number	Hydrology	Vegetation	Soils	Wetland Determination
HI-1	Yes – C3, C9 & D5	Yes – DT & PI	Yes – F7	Yes*
R-1	Yes – A2, A3, C9 & D5	Yes – DT & PI	Yes – F3	Yes
R-2	Yes – C3, C9 & D5	Yes – DT & PI	Yes – F6	Yes
R-3	Yes – A2, A3, C3 & D5	Yes – DT & PI	Yes – F3	Yes
R-4	No	Yes – DT	No	No
R-5	No	Yes – DT & PI	No	No
R-6	No	Yes – DT & PI	No	No
R-7	Yes – A2, A3, B7, B8, C1, & D5	Yes – DT & PI	Yes – F3	Yes
R-8	Yes – A2, A3 & C9	No	No	No
R-9	Yes – A2, A3, C3, C9 & D5	Yes – DT & PI	Yes – F3	Yes
R-10	Yes – A2, A3 C9 & D5	Yes – DT & PI	Yes – F7	Yes
R-11	Yes – A3, C9 & D5	Yes - PI	No	No
PL-1	No	No	Yes – F3	No
PL-2	No	No	Yes – F3	No





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**Table 2: Midway to Harbor Island Pipeline Project Data Point Summary**

<b>Data Point Number</b>	<b>Hydrology</b>	<b>Vegetation</b>	<b>Soils</b>	<b>Wetland Determination</b>
<b>PL-3</b>	<b>Yes – A2, A3, B8 &amp; C9</b>	No	No	No
<b>PL-4</b>	<b>Yes – A2, A3 &amp; C9</b>	No	No	No
<b>PL-5</b>	<b>Yes – A2, A3 &amp; C9</b>	No	No	No
<b>PL-6</b>	<b>Yes – A2, A3 &amp; C9</b>	No	<b>Yes – F3</b>	No
<b>PL-7</b>	<b>Yes – A1, A2, A3 &amp; C9</b>	No	No	No
<b>PL-8</b>	No	--	No	No
<b>PL-9</b>	No**	No**	No**	No**
<b>PL-10</b>	No	No	No	No
<b>PL-11</b>	No**	No**	No**	No**
<b>PL-12</b>	No	No	<b>Yes – F6</b>	No
<b>PL-13</b>	No	No	No	No
<b>PL-14</b>	No – C9	No**	No	No
<b>PL-15</b>	No – C9	No**	<b>Yes – F7</b>	No
<b>PL-16</b>	No – C9	No**	No	No
<b>PL-17</b>	No – C9	No**	<b>Yes-F7</b>	No
<b>PL-18</b>	No – C9**	No**	No**	No**
<b>PL-19</b>	No – C9**	No**	No**	No**
<b>PL-20</b>	No – C9**	No**	No**	No**
<b>PL-21</b>	No – C9**	No**	No**	No**
<b>PL-22</b>	No **	No**	No**	No**
<b>PL-23</b>	No – C9**	No**	No**	No**
<b>PL-24</b>	No – C9**	No**	No**	No**

\* Site is within leveed area above normal marsh  
 \*\* Agricultural field, no data collected.

**Hydrology Indicators:**

- A1 – Surface Water
- A2 – High Water Table
- A3 – Saturation
- B7 – Inundation Visible on Aerial Imagery
- B8 – Sparsely Vegetated Concave Surface
- B9 – Water-Stained Leaves
- C1 - Hydrogen Sulfide Odor
- C3 - Oxidized Rhizospheres on Living Roots
- C9 - Saturation Visible on Aerial Imagery
- D5 – FAC-Neutral Test

**Vegetation Indicators:**

- DT – Dominance Test
- PI – Prevalence Index

**Soils Indicators:**

- F3 – Depleted Matrix
- F6 – Redox Dark Surface
- F7 – Depleted Dark Surface



## 4.0 RESULTS & DISCUSSIONS

### 4.1 Harbor Island

Harbor Island consists of an industrial site and a bermed fill area (**Figure 6, Harbor Island**). The site is bounded by a McDermott dock to the east, the Port of Corpus Christi Channel to the south, Corps' discharge material placement area (DMPA #3) to the west and Redfish Bay to the north. Elevation at the Harbor Island site ranges between 10 to 15-ft. above mean sea level. Elevations within the bermed area decrease from north to south. The southwestern corner of the bermed area contained standing water. No drainage connection between the bermed area and adjacent areas was observed.

**HI-1:** Plot HI-1 was collected within the bermed area, approximately near the center. The Plot consisted of a mix of FAC, FACW and OBL grasses and some OBL scrub-shrub vegetation that meet the DT and PI for hydrophytic vegetation. Soils at the Plot appeared to be fill material; however, the top 5-in. of fill meets the hydric soil criteria (F7). No primary indicators of hydrology were observed; however, two secondary indicators (C9 and D5) were present. The Plot meets the criteria of a wetland. However, the nature of the site (filled area) and the lack of connectivity to adjacent areas disqualifies the site from §404 jurisdiction

### 4.2 Redfish Facility

The Redfish Facility consists of an industrial site and bermed tidal wetlands situated between the Gulf Intracoastal Waterway (GIWW) to the east and FM 2725 to the west (**Figure 6, Redfish**). Elevation within the Redfish Facility site ranges between 0 to 7-ft. above mean sea level. The area drains through a tidal channel into the GIWW immediately south of the Site. All bermed areas were observed to be connected by culverts.

**R-1:** Plot R-1 was collected in a marsh area adjacent to the GIWW. The vegetation consisted primarily of FACW and OBL grasses and sedges and met the DT and PI for hydrophytic vegetation. The sandy loam soils meet the hydric soil criteria (F3). The Plot exhibited two primary indicators (A2 and A3) and two secondary indicators (C9 and D5). The Plot meets the criteria of a wetland.

**R-2:** Plot R-2 was collected in a marsh area adjacent to the GIWW. The Site appeared to be a microtopographic high, possibly due to fill material placement. The vegetation consisted primarily of FAC and FACW grasses and met the DT and PI for hydrophytic vegetation. The sandy loam soils meet the hydric soil criteria (F6). The Plot exhibited one primary indicator (C3) and two secondary indicators (C9 and D5) of hydrology. The Plot meets the criteria of a wetland.

**R-3:** Plot R-3 was collected within the leveed area near the center west of East Beasley Ave. The southwestern portion of the leveed area contains an inactive well site. The pad site has been filled and is at an elevation of approximately 6-ft. The vegetation consisted primarily of FAC and FACW grasses along with FACW shrubs. The sandy loam soils meet the hydric soil criteria (F6). The Plot exhibited four primary indicators (A2, A3, B7 and C3) and one secondary indicator (D5) of hydrology. The Plot meets the criteria of a wetland.

**R-4:** Plot R-4 was collected within the leveed area west of East Beasley Ave. on the slope of the well pad/road fill. The vegetation consisted primarily of FAC grasses. The sandy loam soils contained shell debris from the pad/road fill. Soils at this Plot did not meet the hydric soil criteria. The Plot did not exhibit indicators of hydrology. The Plot does not meet the criteria of a wetland.



**R-5:** Plot R-5 was collected in a tidal marsh area west of the industrial site. The Plot site appeared to be a microtopographic high (possibly pimple mound). The vegetation consisted primarily of FAC grasses and met the DT and PI for hydrophytic vegetation. The sandy loam soils did not meet the hydric soil criteria. The Plot did not exhibit indicators of hydrology. The Plot does not meet the criteria of a wetland.

**R-6:** Plot R-6 was collected in a tidal marsh area near the edge of the same microtopographic high as Plot R-5. The vegetation consisted primarily of FAC grasses and met the DT and PI for hydrophytic vegetation. The sandy loam soils did not meet the hydric soil criteria. The Plot exhibited only one secondary indicator of hydrology (D5). The Plot does not meet the criteria of a wetland.

**R7:** Plot R-6 was collected in a tidal marsh area off of the microtopographic high. The vegetation consisted primarily of FAC and FACW grasses and OBL aquatic vegetation and met the DT and PI for hydrophytic vegetation. The sandy loam soil meets the hydric soil criteria (F3). The Plot exhibited four primary (A2, A3, B7 and C1) and two secondary indicators of hydrology (B8 and D5). The Plot meets the criteria of a wetland.

**R-8:** Plot R-8 was collected within the leveed area west of the industrial site, on the slope of the road fill (E. Beasley Ave.). The vegetation consisted primarily of FAC and FACU species. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils did not meet the hydric soil criteria. The Plot exhibited two primary (A2 and A3) and one secondary indicator of hydrology (C9). The Plot does not meet the criteria of a wetland.

**R-9:** Plot R-9 was collected in a marsh area west of the industrial site. The vegetation consisted primarily of OBL rushes along with FAC and FACW shrubs. The Plot meets the DT and PI for hydrophytic vegetation. The loam soils meet the hydric soil criteria (F3). The Plot exhibited three primary indicators (A2, A3 and C3) and two secondary indicators (C9 and D5). The Plot meets the criteria of a wetland.

**R-10:** Plot R-10 was collected in a higher marsh area west of the industrial site. The vegetation consisted primarily of FAC and OBL grasses and rushes along with FAC shrubs and FAC and FACU vines. The Plot meets the DT and PI for hydrophytic vegetation. The loam soils meet the hydric soil criteria (F3). The Plot exhibited two primary indicators (A2 and A3) and two secondary indicators (C9 and D5). The Plot meets the criteria of a wetland.

**R-11:** Plot R-11 was collected in a higher marsh area west of the industrial site. The vegetation consisted primarily of FACU and OBL species along with FAC shrubs and FACU vines. The Plot meets the PI for hydrophytic vegetation. The sandy loam soil did not meet the hydric soil criteria. The Plot exhibited one primary indicators (A3) and two secondary indicators (C9 and D5). The Plot does not meet the criteria of a wetland.

### 4.3 Pipeline Corridor

The pipeline corridor crosses a variety of habitats between the Redfish and the Midway Facilities (**Figures 6, Pipeline Corridor**). Between the Midway Facility and Hwy. 35 the route is predominantly agricultural. Between Hwy. 35 and FM 1069 the route is a mix of agriculture and pasture lands. Between FM 1069 and the Redfish Facility the route crosses some pastureland as well as residential development. Much of the residential development occurs on Oak Ridge. Elevations along the ridge area range from 15 to 25-feet above mean sea level. The ridge supports an upland forest community consisting primarily of live oak (*Quercus virginiana*). No wetlands were identified along the pipeline corridor. Waterbody crossings identified within the corridor are presented in tables below.





**PL-1:** Plot PL-1 is situated on a grassy area between Hwy 2725 and the Union Pacific Railroad tracks. A man-made drainage feature (non-relatively permanent water; non-RPW) was observed south and west of the Plot. No ordinary high-water mark was observed. The feature drained easterly into the marshlands across Hwy 2725. The vegetation consisted primarily of FACU and UPL grasses. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils meet the hydric soil criteria (F3). The Plot did not exhibit indicators of hydrology and therefore did not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-2:** Plot PL-2 is situated within a residential area on Oak Ridge west of Hwy. 136 (Avenue A). Topography at the Plot sloped gently to the north. The vegetation consisted primarily of FACU trees and shrubs, and FAC and FACU vines. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soil did not meet the hydric soil criteria. The Plot exhibited only one secondary indicators of hydrology. The Plot did not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-3:** Plot PL-3 is situated down slope from Plot PL-3. The vegetation consisted primarily of FACU trees and shrubs, FACU grasses and FAC and FACU vines. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils meet the hydric soil criteria (F3). The Plot exhibited two primary (A2 and A3) and two secondary indicators (B8 and C9) of hydrology. The Plot meets the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-4:** Plot PL-4 is situated within a residential area on Oak Ridge west of Hwy. 136 (Avenue A) adjacent to the Buckeye Pipeline right-of-way. Topography at the Plot sloped gently to the north. The vegetation consisted primarily of FACU trees and shrubs, FACU grasses and FAC vines. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soil did not meet the hydric soil criteria. The Plot exhibited two primary (A2 and A3) and one secondary indicator (C9) of hydrology. The Plot meets the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-5:** Plot PL-5 is situated within a residential area on Oak Ridge west of Hwy. 136 (Avenue A). Topography at the Plot sloped gently to the north. The vegetation consisted primarily of FACU trees and shrubs, FACU grasses and FAC vines. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soil did not meet the hydric soil criteria. The Plot exhibited two primary (A2 and A3) and one secondary indicator (C9) of hydrology. The Plot meets the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-6:** Plot PL-6 wet is situated within a pastureland east of Hwy. 1069 (N. Main St.). The Plot is not situated on Oak Ridge. The vegetation consisted primarily of UPL shrubs and UPL and FAC grasses. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils meet the hydric soil criteria (F3). The Plot exhibited two primary (A2 and A3) and one secondary indicator (C9) of hydrology. The Plot meets the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-7:** Plot PL-7 is situated within a pastureland west of McCampbell Road. The vegetation consisted primarily of UPL shrubs and UPL and FAC grasses. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils meet the hydric soil criteria (F3). The Plot exhibited three primary (A1, A2 and A3) and one secondary indicator (C9) of hydrology. The Plot meets the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-8:** Plot PL-8 is situated within a pastureland west of McCampbell Road. The vegetation consisted primarily of UPL shrubs and FACU grasses. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils did not meet the hydric soil criteria. The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.





**PL-9:** Plot PL-9 is situated within a fallow cotton field south of Hwy. 35. No data was collected.

**PL-10:** Plot PL-10 is situated within a pastureland east of Hwy. 106 (McKamey Road). The vegetation consisted primarily of FAC and FACU grasses. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils did not meet the hydric soil criteria. The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-11:** Plot PL-11 is situated within a fallow cotton field south of Hwy. 35. No data was collected.

**PL-12:** Plot PL-12 is situated within a pastureland west of Hwy. 106 (McKamey Road). This site may have historically been used as a landfill. The vegetation consisted primarily of FACU grasses. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils did meet the hydric soil criteria (F3) ; lime was visible in the soil matrix at 8-inches. The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-13:** Plot PL-13 is situated within a pipeline right-of-way west of Hwy. 106 (McKamey Road). The vegetation consisted primarily of FAC and FACU grasses. The Plot did not meet the hydrophytic vegetation criteria. The sandy loam soils did not meet the hydric soil criteria. The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-14:** Plot PL-14 is situated within a fallow agricultural field east of FM 3284. No vegetation data was collected. The loamy clay soils did not meet the hydric soil criteria. The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-15:** Plot PL-15 is situated within a fallow agricultural field east of FM 85. No vegetation data was collected. The clay loam soils did meet the hydric soil criteria (F7). The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-16:** Plot PL-16 is situated within a fallow agricultural field north of Hwy. 81. The Plot was situated west of a man-made drainage feature (See table below). No vegetation data was collected. The loamy clay soils did not meet the hydric soil criteria. The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

Parameter	Width	Channel Depth	Water Depth	Substrate	Flow Direction
Top of Bank	50' 5"	12'	2'	Silt & Sand	South
Ordinary High-Water	28' 10"	4' 6"	2'	--	--

**PL-17:** Plot PL-17 is situated within a fallow agricultural field north of Hwy. 81. The Plot was situated west of a man-made drainage feature (See table above). No vegetation data was collected. The loamy clay soils did





not meet the hydric soil criteria. The Plot exhibited one secondary indicator (C9) of hydrology. The Plot does not meet the hydrology criteria. The Plot does not meet the criteria of a wetland.

**PL-18:** Plot PL-18 is situated within a fallow agricultural field south of Hwy. 81. No data was collected.

**PL-19:** Plot PL-19 is situated within a fallow agricultural field north of FM 78. A man-made drainage feature was observed on the south side of FM78 (See table below). No data was collected.

Parameter	Width	Channel Depth	Water Depth	Substrate	Flow Direction
Top of Bank	20' 1"	3' 6"	9"	Silt & Sand	South
Ordinary High-Water	17' 4"	3'	9"	--	--

**PL-20:** Plot PL-20 is situated within a fallow agricultural field north of FM 1906. No data was collected.

**PL-21:** Plot PL-21 is situated within a fallow agricultural field east of FM 79. A man-made drainage feature was observed adjacent to the Plot (See table below). No data was collected.

Parameter	Width	Channel Depth	Water Depth	Substrate	Flow Direction
Top of Bank	11' 4"	8"	8"	Silt & Sand	South
Ordinary High-Water	11' 4"	8"	8"	--	--

**PL-22:** Plot PL-22 is situated within a fallow agricultural field east of FM 77. A man-made drainage feature was observed adjacent to the Plot. The feature was too large to obtain measurements. No data was collected

**PL-23:** Plot PL-23 is situated within a fallow agricultural field west of FM 75. No data was collected.

**PL-24:** Plot PL-24 is situated within a fallow agricultural field east of FM 893. No data was collected.

## **5.0 ADDITIONAL INFORMATION**

Additional wetlands data was collected by Triton Environmental Solutions LLC for the wetlands adjacent to Harbor Island and the Redfish Facility site. This data is presented under separate cover as an Attachment to the §10/404 permit application.

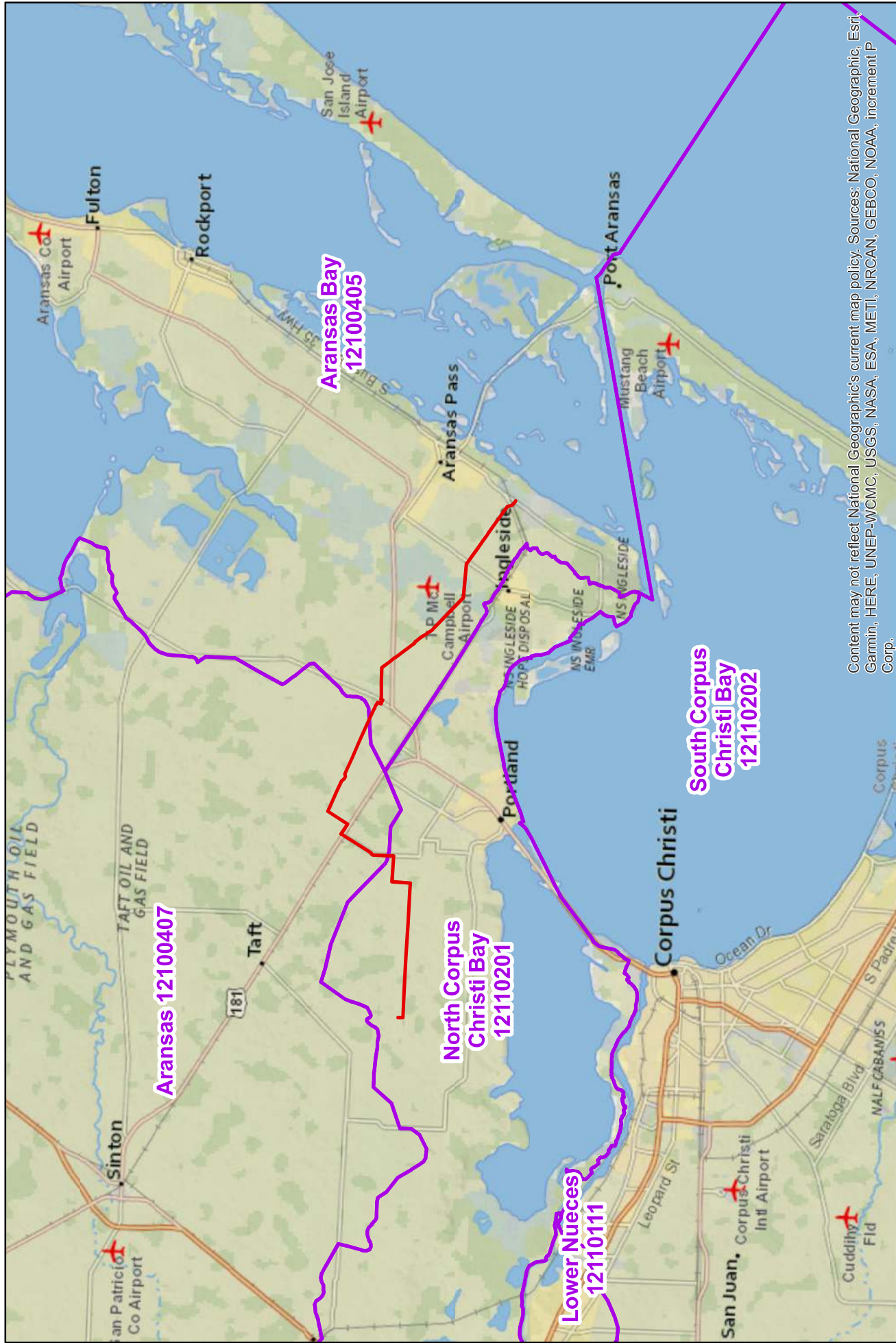


## 6.0 REFERENCES

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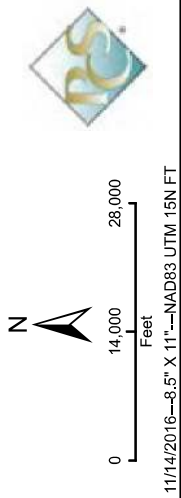
**Appendix A**  
**Figures**





Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

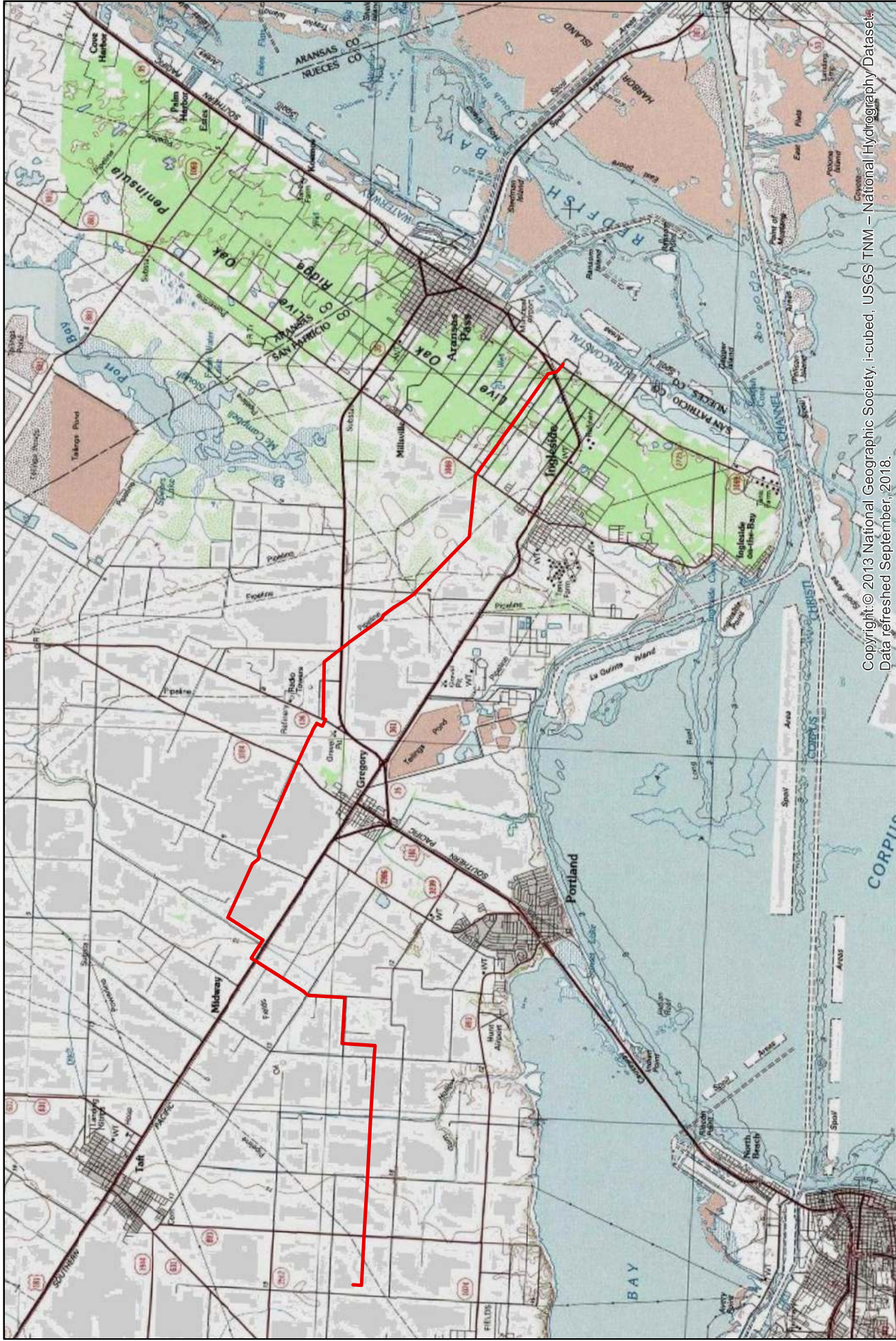
Data Source: USGS Watershed Boundaries



**FIGURE 1: SITE VICINITY MAP**  
 AXIS MIDSTREAM PIPELINE  
 PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
 NUECES AND SAN PATRICIO COUNTIES, TEXAS

- Proposed Axis Pipeline
- Hydrologic Unit Code (HUC)

11/14/2016--8.5" X 11"--NAD83 UTM 15N FT



Copyright © 2013 National Geographic Society, i-cubed, USGS TNN — National Hydrography Datasets  
 Data refreshed September, 2018.

Data Source: 2013 National Geographic Society, i-cubed

## FIGURE 2: TOPOGRAPHIC MAP

AXIS MIDSTREAM PIPELINE  
 PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
 NUECES AND SAN PATRICIO COUNTIES, TEXAS

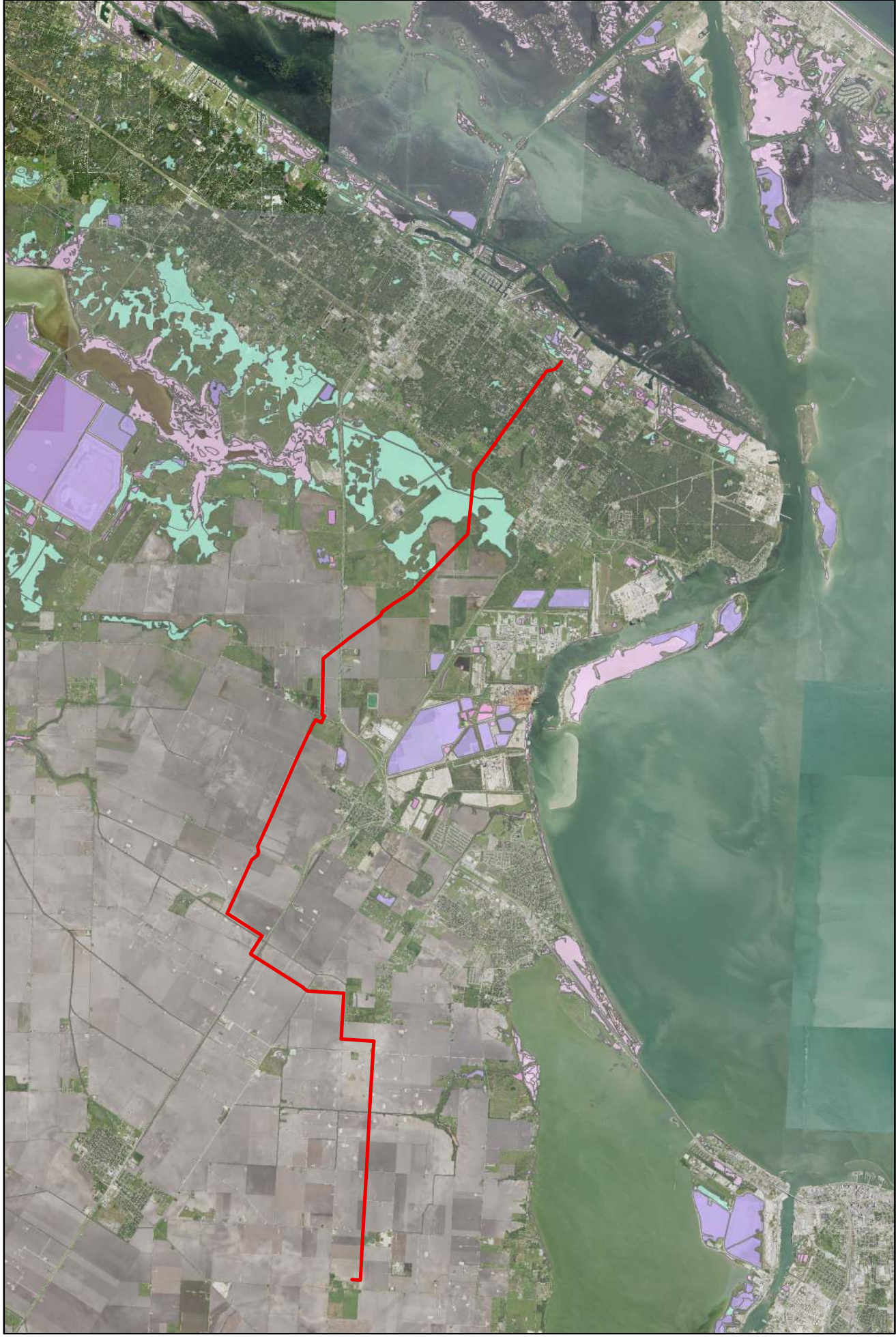
Proposed Axis Pipeline



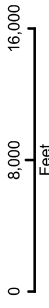
0 8,000 16,000  
 Feet

11/14/2016--8.5" X 11"---NAD83 UTM 15N FT





Data Source: USFWS 2015 NWI



11/14/2016--8.5" X 11"--NAD83 UTM 15N FT

**FIGURE 3: NWI MAP**  
**AXIS MIDSTREAM PIPELINE**  
**PROPOSED AXIS MIDSTREAM PIPELINE PROJECT**  
**NUECES AND SAN PATRICIO COUNTIES, TEXAS**

- Proposed Axis Pipeline
- NWI**
- █ Estuarine and Marine Wetland
- █ Freshwater Emergent Wetland
- █ Freshwater Forested/Shrub Wetland
- █ Freshwater Pond
- █ Lake
- █ Riverine

**SOILS WITHIN THE SURVEY AREA**

**As:** Arkansas clay, 0 to 1 percent slopes, slightly saline, moderately sodic, frequently flooded; Hydric Rating 97

**Ds:** Dianola soils; Hydric Rating 100

**Dt:** Dietrich loamy fine sand, 0 to 1 percent slopes, very rarely flooded; Hydric Rating 100

**GMI:** Galveston-Mustang complex, 0 to 3 percent slopes, occasionally flooded, frequently ponded; Hydric Rating 50

**Is:** Ijam soils, rarely flooded; Hydric Rating 95

**Mu:** Mustang fine sand, 0 to 1 percent slopes, occasionally flooded, frequently ponded; Hydric Rating 95

**Na:** Natta loam, 0 to 1 percent slopes, rarely flooded; Hydric Rating 94

**Nu:** Nueces fine sand; Non-Hydric

**Or:** Orelia fine sandy loam, 0 to 1 percent slopes; Non-Hydric

**Os:** Calallen sandy clay loam, 0 to 1 percent slopes; Non-Hydric

**PaA:** Papalote fine sandy loam, 0 to 1 percent slopes; Non-Hydric

**PaB:** Raymondville clay loam, 0 to 1 percent slopes; Non-Hydric

**RaA:** Raymondville clay loam, 1 to 3 percent slopes; Non-Hydric

**RaB:** Raymondville clay loam, 1 to 3 percent slopes; Non-Hydric

**Ta:** Tidal flats, occasionally ponded; Non-Hydric

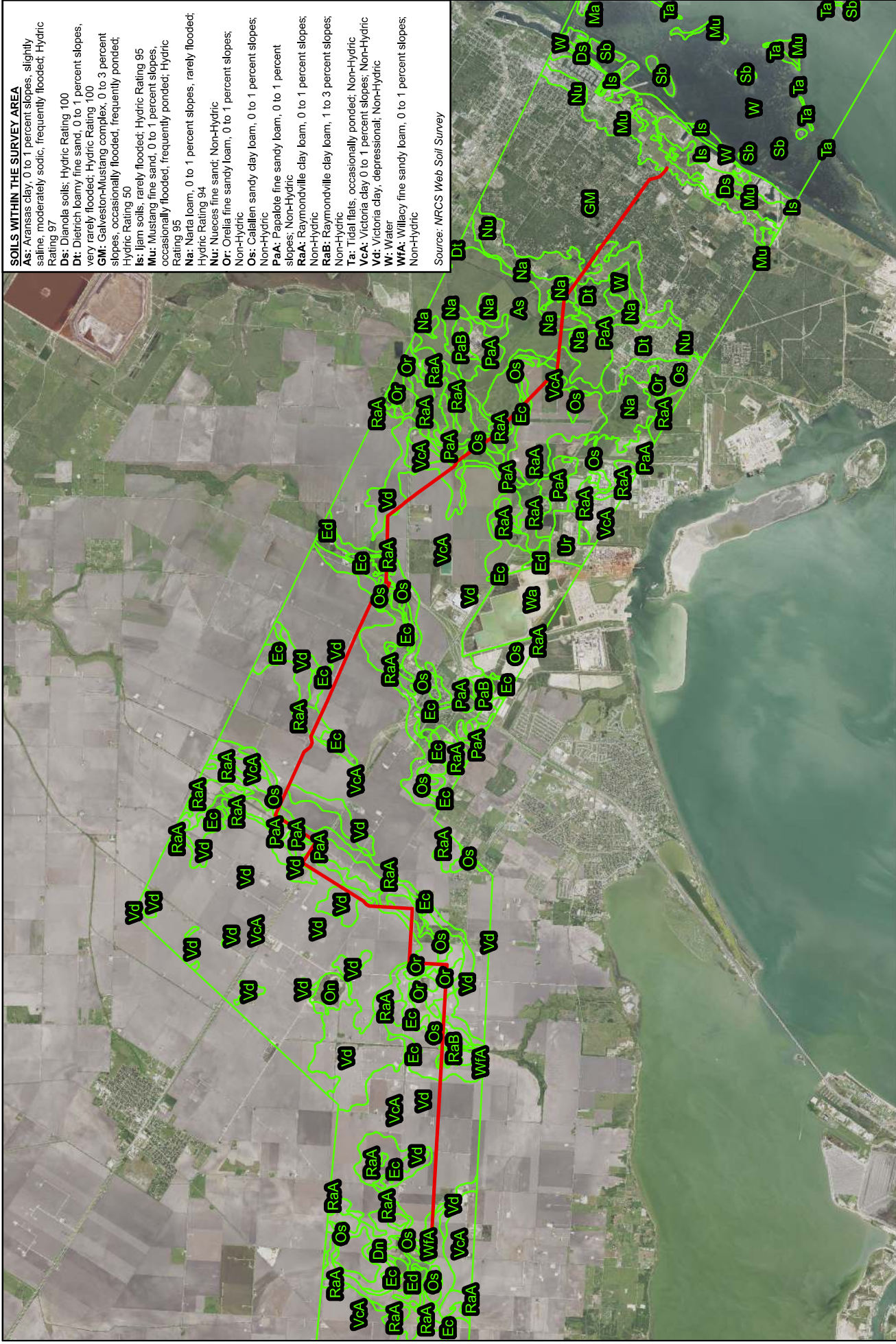
**VcA:** Victoria clay 0 to 1 percent slopes; Non-Hydric

**Vd:** Victoria clay, depressionai; Non-Hydric

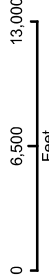
**W:** Water

**WFA:** Willacy fine sandy loam, 0 to 1 percent slopes; Non-Hydric

Source: NRCS Web Soil Survey



Data Source: NRCS USDA 2016  
 Imagery Source: NMAP CIR 2004



11/14/2016--8.5° X 11"--NAD83 UTM 15N FT

**FIGURE 4: NRCS SOILS MAP**  
 AXIS MIDSTREAM PIPELINE  
 PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
 NUECES AND SAN PATRICIO COUNTIES, TEXAS

Proposed Axis Pipeline

NRCS Soil





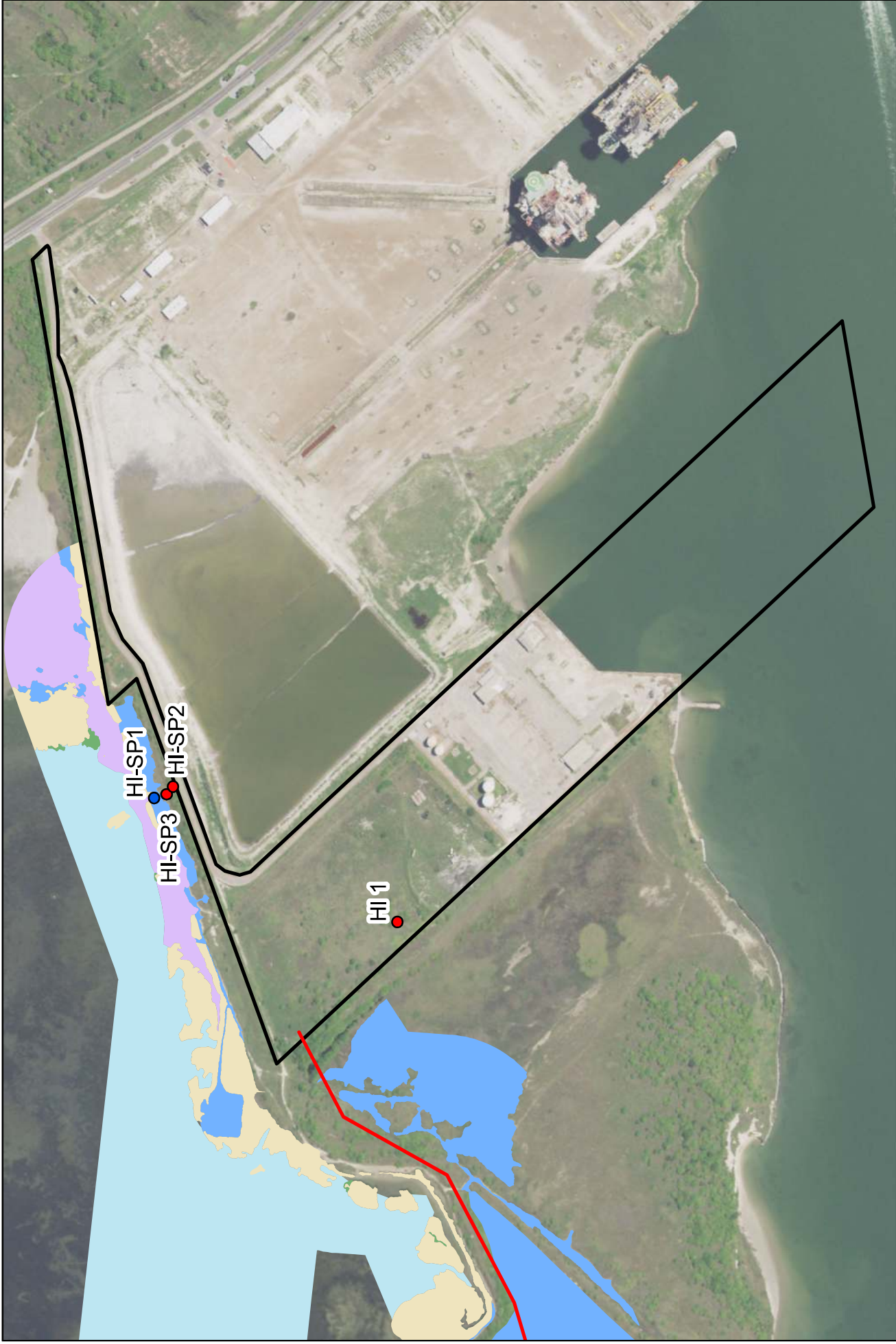
Data Source: FEMA National Flood Hazard Layer  
 NAP 2015



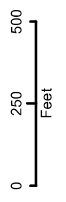
**FIGURE 5: FEMA NATIONAL FLOOD HAZARD**  
 AXIS MIDSTREAM PIPELINE  
 PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
 NUECES AND SAN PATRICIO COUNTIES, TEXAS

Proposed Axis Pipeline  
 FLOODWAY  
 0.2 PCT ANNUAL CHANCE FLOOD

11/14/2016--8.5" X 11"--NAD83 UTM 15N FT



Imagery Source: NMAP 2015



11/14/2016--8.5" X 11"--NAD83 UTM 15N FT

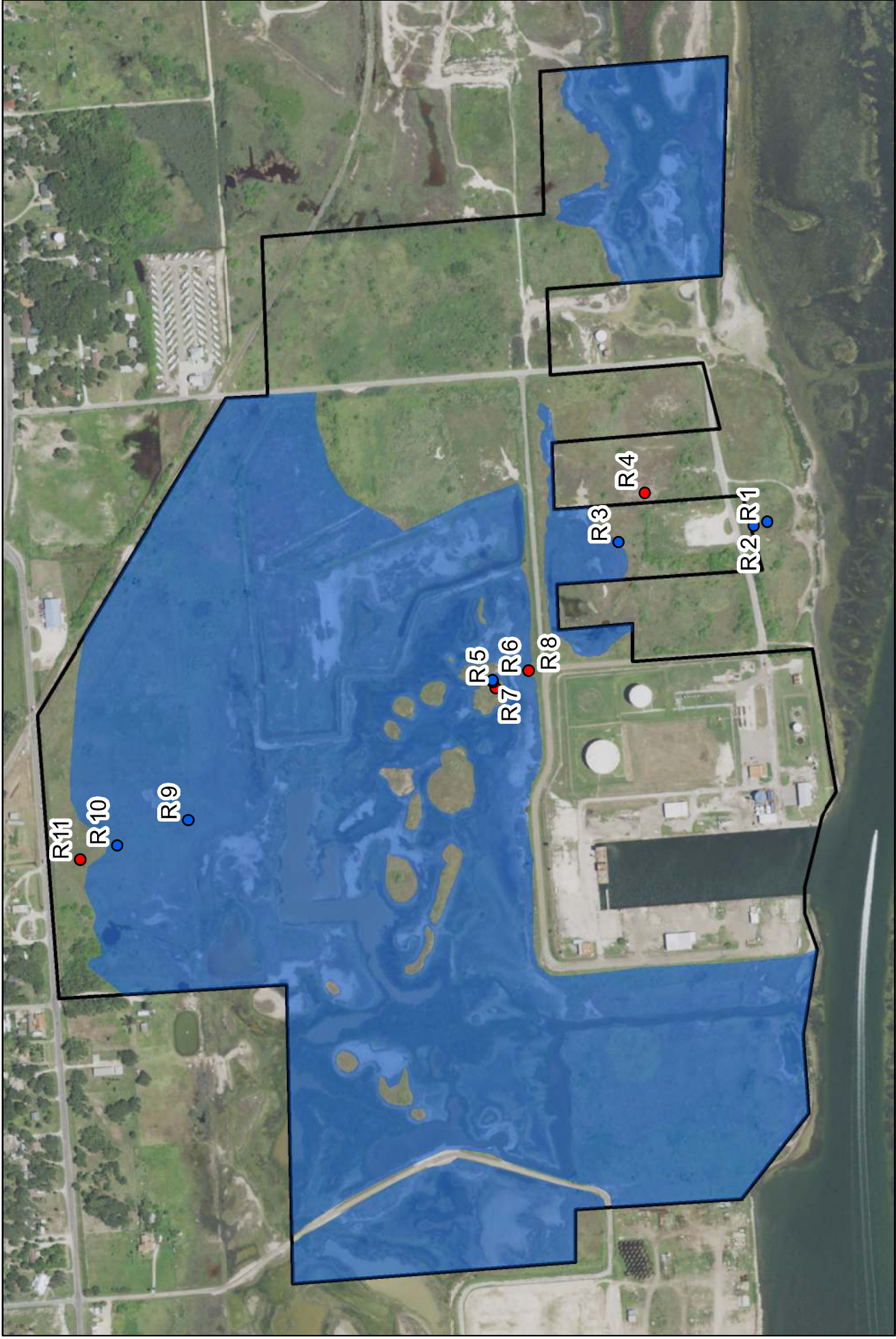
# Harbor Island

## AXIS MIDSTREAM PIPELINE

### PROPOSED AXIS MIDSTREAM PIPELINE PROJECT

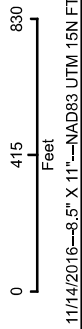
ARANSAS AND SAN PATRICIO COUNTIES, TEXAS

- Sample Points**
- Upland Point
  - Wetland Point
  - Proposed Pipeline
- Tidal Flats
  - Estuarine Wetlands
  - Seagrass Beds
  - Smooth Cordgrass
  - Black Mangrove



- Up
- Wet
- Wetland
- Redfish

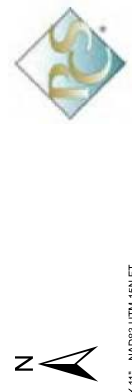
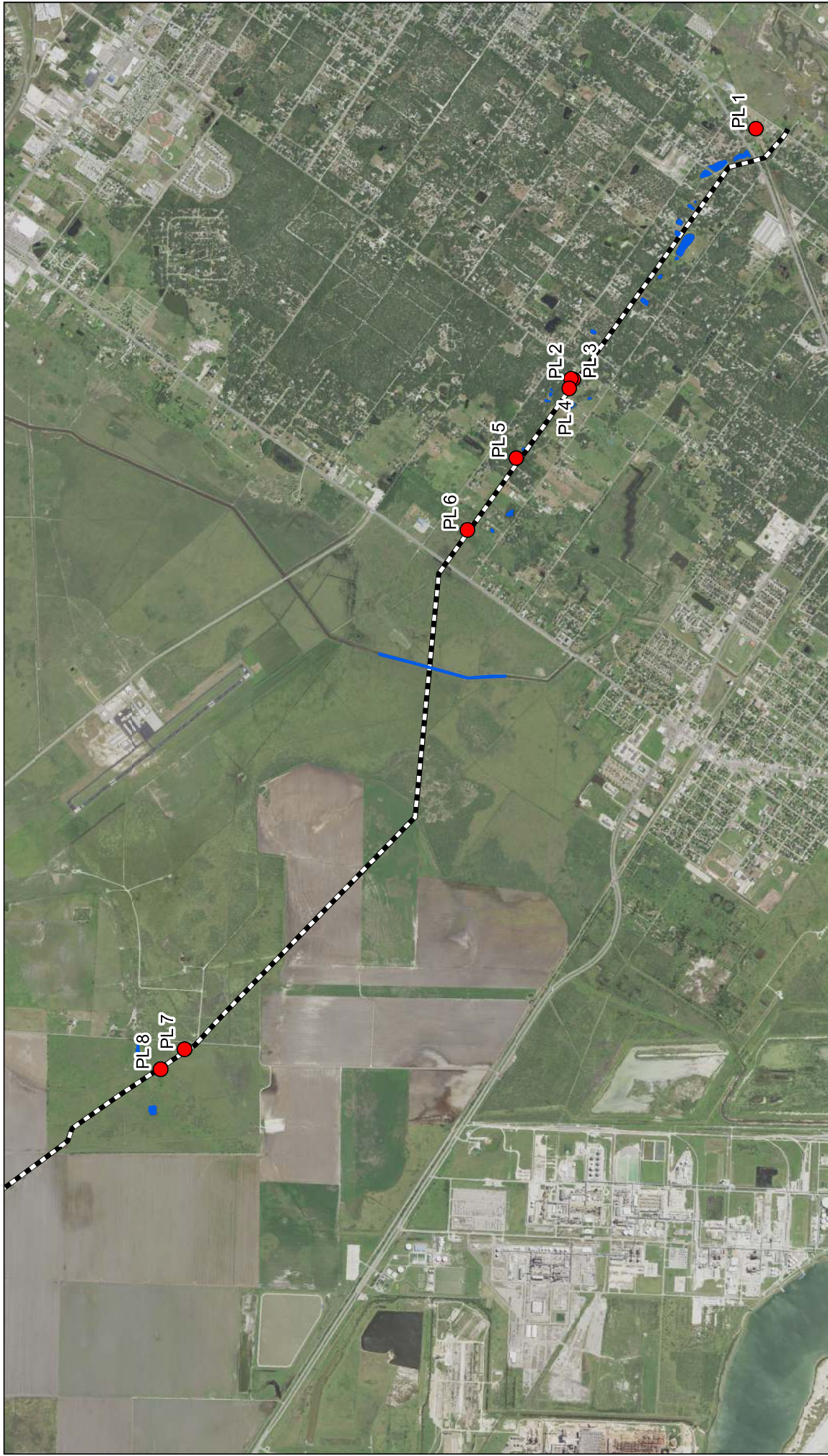
**Redfish Wetland Map**  
 AXIS MIDSTREAM PIPELINE  
 PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
 ARANSAS AND SAN PATRICIO COUNTIES, TEXAS



Data Source: NRCS USDA 2016  
 Imagery Source: NADP CIR 2004

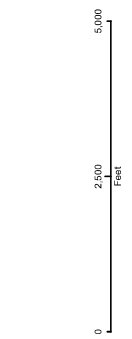


11/14/2016--8.5" X 11"--NAD83 UTM 15N FT



11742016--8.5" X 11"--NAD83 UTM 15N FT

**PIPELINE DELINEATION PAGE 1**  
 AXIS MIDSTREAM PIPELINE  
 PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
 ARANSAS AND SAN PATRICIO COUNTIES, TEXAS

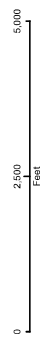


- Upland
- Wetland
- Waterbodies
- Proposed Pipeline





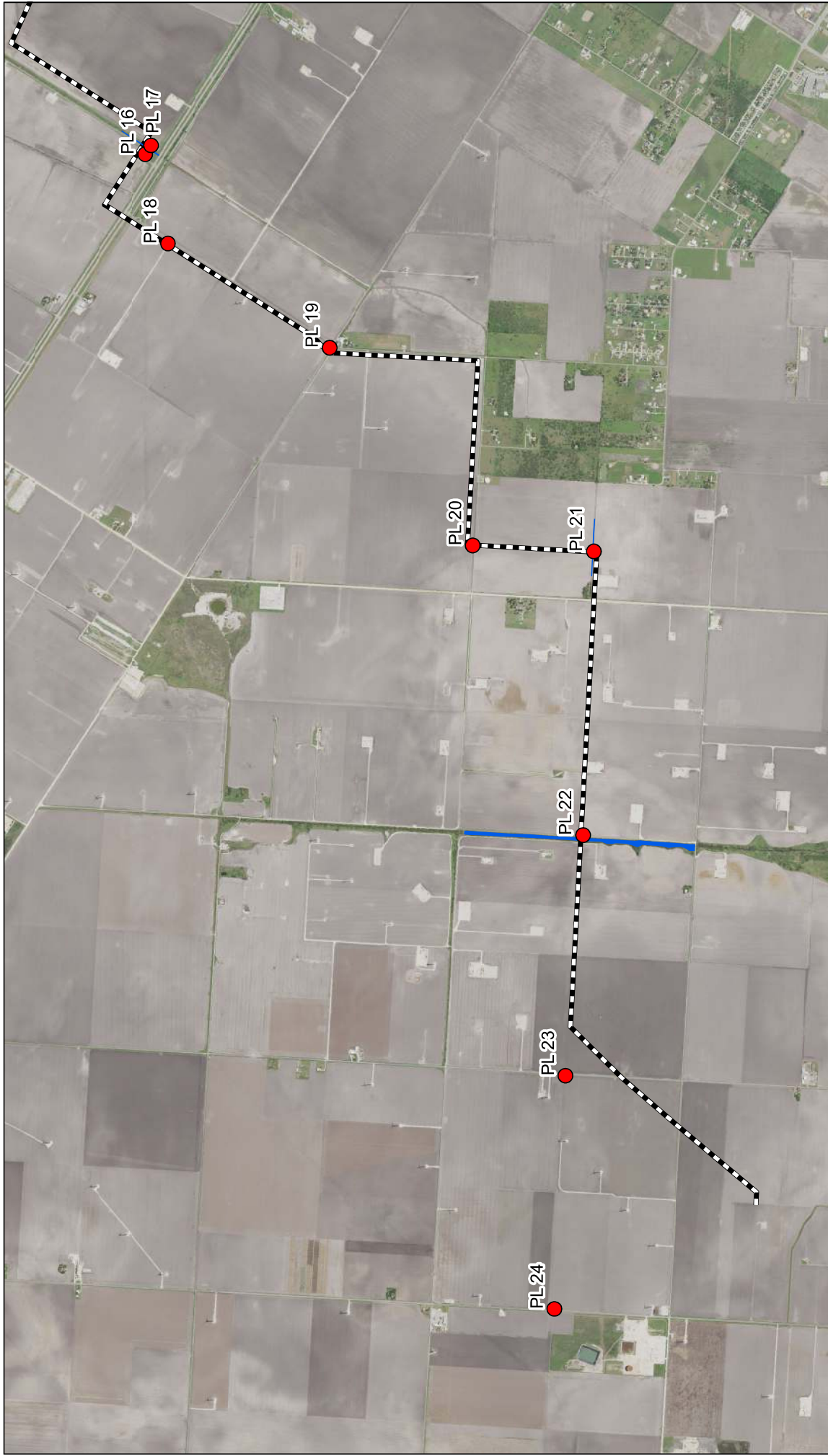
- Upland
- Wetland
- Waterbodies
- Proposed Pipeline



**PIPELINE DELINEATION PAGE 2**  
AXIS MIDSTREAM PIPELINE  
PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
ARANSAS AND SAN PATRICIO COUNTIES, TEXAS



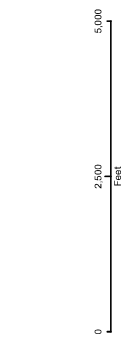
11/4/2016--8.5' X 11"--NAD83 UTM 15N FT



11/4/2016--8.5" X 11"--MDD3 UTM 15N FT

### PIPELINE DELINEATION PAGE 3

AXIS MIDSTREAM PIPELINE  
 PROPOSED AXIS MIDSTREAM PIPELINE PROJECT  
 ARANSAS AND SAN PATRICIO COUNTIES, TEXAS



- Upland
- Wetland
- Waterbodies
- Proposed Pipeline

**Appendix B**  
**Data Sheets & Photo Log**

**WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region**

Project/Site: Axis - Harbor Island City/County: Aransas Co. Sampling Date: 11/27/2018  
 Applicant/Owner: Axis Midstream Partners, LLC State: TX Sampling Point: HI-1  
 Investigator(s): R. Ganczak & A. Snellgrove Section, Township, Range: NA  
 Landform (hillslope, terrace, etc.): Leveed area Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR or MLRA): LRRT/150B Lat: 27.846253° Long: -97.086589° Datum: WGS 84  
 Soil Map Unit Name: Ta - tidal flats NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No X  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____
Remarks: Plot located inside levee area ± 8-ft. above normal marsh. Area appears to have been filled. No culverts or cuts to outside observed.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<b>Secondary Indicators (minimum of two required)</b> <table style="width:100%; border: none;"> <tr><td style="border: none;"><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td style="border: none;"><input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td style="border: none;"><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)																															
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)																															
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)																															
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																															
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)																															
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<input checked="" type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)																																

<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  
**NRCS Soil Survey Data, Aerial Photography, NHD Data**

Remarks:  
 Plot meets the Hydrology Criteria with one primary (C3) and two secondary indicators (C9 & D5).

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: HI-1

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species <u>50</u> x 1 = <u>50</u> FACW species <u>20</u> x 2 = <u>40</u> FAC species <u>55</u> x 3 = <u>165</u> FACU species _____ x 4 = _____ UPL species <u>2</u> x 5 = <u>10</u> Column Totals: <u>127</u> (A) <u>175</u> (B)  Prevalence Index = B/A = <u>1.4</u>
50% of total cover: _____		20% of total cover: _____		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>30'</u> )				
1. <u>Avicennia germinans</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>15</u>		20% of total cover: <u>6</u>		
<b>Herb Stratum</b> (Plot size: <u>30'</u> )				
1. <u>Andropogon gerardii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
2. <u>Andropogon virginicus</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Eragrostis lugens (?)</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. <u>Juncus effusus</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>	
5. <u>Paspalum floridanum</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	
6. <u>Opuntia stricta</u>	<u>2</u>	<u>No</u>	<u>UPL</u>	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
50% of total cover: <u>48.5</u>		20% of total cover: <u>19.4</u>		
<b>Woody Vine Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____		20% of total cover: _____		

Remarks: (If observed, list morphological adaptations below).

Plot meets hydrophytic vegetation criteria (DT & PI).

**SOIL**

Sampling Point: HI-1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	10YR 3/1	97	10YR 3/6	3	D	M	clay loam	
5-9	10YR 6/3	95	10YR 4/6	5	D	M	sandy loam	
9-16	10YR 6/3	100					sandy loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No \_\_\_\_\_

Remarks:

Plot meets hydric soil criteria.



Photo 1 – Soil Sample at Plot HI-1



Photo 2 – Vegetation at HI-1 looking north.



**Wetland Delineation  
Midway to Harbor Island Pipeline Project  
PCS Project # 18087**

**Date:** 12/18/18



Photo 3 –Levee at southeast corner of HI looking northwesterly



Photo 4 – Levee at southeast corner of HI looking northeasterly







**Wetland Delineation  
Midway to Harbor Island Pipeline Project  
PCS Project # 18087**

**Date:** 12/18/18



Photo 5 –Levee at northwest corner of HI looking southwesterly.



Photo 6 – Levee at northwest corner of HI looking southeasterly





**Wetland Delineation  
Midway to Harbor Island Pipeline Project  
PCS Project # 18087**

**Date:** 12/18/18



Photo 7 – Levee at southwest corner of HI looking southeasterly



Photo 8 – Levee at southwest corner of HI looking northeasterly



**WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region**

Project/Site: Axis - Redfish Facility City/County: San Patricio Co. Sampling Date: 11/27/2018  
 Applicant/Owner: Axis Midstream Partners, LLC State: TX Sampling Point: R-1  
 Investigator(s): R. Ganczak & A. Snellgrove Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): high marsh Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR or MLRA): LRRT/150B Lat: 27.875307° Long: -97.156323° Datum: WGS 84  
 Soil Map Unit Name: Is - Ijam - rarely flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____
Remarks: High marsh between Redfish Bay & Beadle St.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input checked="" type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<b>Secondary Indicators (minimum of two required)</b> <table style="width:100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)																															
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)																															
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)																															
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																															
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<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																																
<input type="checkbox"/> Water-Stained Leaves (B9)																																
<input type="checkbox"/> Surface Soil Cracks (B6)																																
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<input checked="" type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)																																

<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>16</u> Saturation Present? (includes capillary fringe) Yes <u>X</u> No _____ Depth (inches): <u>8</u>	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  
**NRCS Soil Survey Data, Aerial Photography, NHD Data**

Remarks:  
 Plot meets the Hydrology Criteria with two primary (A2 & A3) and two secondary indicators (C9 & D5).

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: R-1

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species <u>20</u> x 1 = <u>20</u> FACW species <u>80</u> x 2 = <u>160</u> FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>180</u> (B)  Prevalence Index = B/A = <u>1.8</u>
50% of total cover: _____		20% of total cover: _____		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: _____		20% of total cover: _____		
<b>Herb Stratum</b> (Plot size: <u>30'</u> )				
1. <u>Spartina patens</u>	<u>60</u>	<u>Yes</u>	<u>FACW</u>	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
2. <u>Fimbristylis castanea</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Andropogon glomeratus</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
50% of total cover: <u>50</u>		20% of total cover: <u>20</u>		
<b>Woody Vine Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____		20% of total cover: _____		
Remarks: (If observed, list morphological adaptations below).				
Plot meets hydrophytic vegetation criteria (DT & PI).				

**SOIL**

Sampling Point: R-1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 4/1	100					sandy loam	
6-12	10YR 5/1	100					sandy loam	
12-15	10YR 6/1	60	10YR 4/1	40	C	C	sandy loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No \_\_\_\_\_

Remarks:

Plot meets hydric soil criterion.



Photo 9 – Soil Sample at Plot R-1



Photo 10 – Vegetation at Plot R-1 looking easterly towards Redfish Bay

**WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region**

Project/Site: Axis - Redfish Facility City/County: San Patricio Co. Sampling Date: 11/27/2018  
 Applicant/Owner: Axis Midstream Partners, LLC State: TX Sampling Point: R-2  
 Investigator(s): R. Ganczak & A. Snellgrove Section, Township, Range: NA  
 Landform (hillslope, terrace, etc.): high marsh Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR or MLRA): LRRT/150B Lat: 27.875368° Long: --97.156500° Datum: WGS 84  
 Soil Map Unit Name: Is - Ijam - rarely flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: High marsh between Redfish Bay & Beadle St. at micro-topographic high, possible fill.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) <b>(LRR U)</b></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) <b>(LRR U)</b>	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<b>Secondary Indicators (minimum of two required)</b> <table style="width:100%; border: none;"> <tr><td style="border: none;"><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td style="border: none;"><input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td style="border: none;"><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sphagnum moss (D8) <b>(LRR T, U)</b></td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) <b>(LRR T, U)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) <b>(LRR U)</b>																															
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)																															
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)																															
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																															
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)																															
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																																
<input type="checkbox"/> Water-Stained Leaves (B9)																																
<input type="checkbox"/> Surface Soil Cracks (B6)																																
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)																																
<input type="checkbox"/> Drainage Patterns (B10)																																
<input type="checkbox"/> Moss Trim Lines (B16)																																
<input type="checkbox"/> Dry-Season Water Table (C2)																																
<input type="checkbox"/> Crayfish Burrows (C8)																																
<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)																																
<input type="checkbox"/> Geomorphic Position (D2)																																
<input type="checkbox"/> Shallow Aquitard (D3)																																
<input checked="" type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D8) <b>(LRR T, U)</b>																																

<b>Field Observations:</b> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>13</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  
**NRCS Soil Survey Data, Aerial Photography, NHD Data**

Remarks:  
 Plot meets the Hydrology Criteria with one primary (C3) and two secondary indicators (C9 & D5).

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: R-2

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>40</u> x 3 = <u>120</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>240</u> (B)  Prevalence Index = B/A = <u>2.4</u>
50% of total cover: _____		20% of total cover: _____		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: _____		20% of total cover: _____		
<b>Herb Stratum</b> (Plot size: <u>30'</u> )				
1. <u>Andropogon virginicus</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
2. <u>Spartina patens</u>	<u>35</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Lycium carolinianum (?)</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Paspalum floridanum (?)</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>95</u> = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
50% of total cover: <u>47.5</u>		20% of total cover: <u>19</u>		
<b>Woody Vine Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____		20% of total cover: _____		
Remarks: (If observed, list morphological adaptations below).				
Plot meets hydrophytic vegetation criteria (DT & PI).				



**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/1	75	10YR 5/2	25	C	M	sandy loam	
6-15	10YR 6/3	99	10YR 3/4	1	C	PL	sandy loam	bits of shell debris
						C		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No \_\_\_\_\_

Remarks:

Plot does meet hydric soil criteria.



Photo 11 – Soil Sample at Plot R-2



Photo 12 – Vegetation at Plot R-2 looking easterly towards Redfish Bay.

**WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region**

Project/Site: Axis - Redfish Facility City/County: San Patricio Co. Sampling Date: 11/27/2018  
 Applicant/Owner: Axis Midstream Partners, LLC State: TX Sampling Point: R-3  
 Investigator(s): R. Ganczak & A. Snellgrove Section, Township, Range: NA  
 Landform (hillslope, terrace, etc.): leveed marsh Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR or MLRA): LRRT/150B Lat: 27.876233° Long: -97.158100° Datum: WGS 84  
 Soil Map Unit Name: Is - Ijam - rarely flooded NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No X  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____
Remarks: Plot taken within leveed area. Connection to outside system by 12" PVC culvert.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one is required; check all that apply)	<u>Secondary Indicators (minimum of two required)</u>
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	

<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>8</u> Saturation Present? (includes capillary fringe) Yes <u>X</u> No _____ Depth (inches): <u>0</u>	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  
**NRCS Soil Survey Data, Aerial Photography, NHD Data**

Remarks:  
 Plot meets the Hydrology Criteria with four primary (A2, A3, B7 & C3) and one secondary indicator (D5).

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: R-3

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>120</u> x 2 = <u>240</u> FAC species <u>40</u> x 3 = <u>120</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>160</u> (A) <u>360</u> (B)  Prevalence Index = B/A = <u>2.3</u>
50% of total cover: _____		20% of total cover: _____		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>30'</u> )				
1. <u>Iva frutescens</u>	<u>60</u>	<u>Yes</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Lycium carolinianum</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>		
<b>Herb Stratum</b> (Plot size: <u>30'</u> )				
1. <u>Andropogon glomeratus</u>	<u>35</u>	<u>Yes</u>	<u>FACW</u>	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
2. <u>Paspalum dilatatum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Spartina patens</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
50% of total cover: <u>45</u>		20% of total cover: <u>18</u>		
<b>Woody Vine Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____		20% of total cover: _____		

Remarks: (If observed, list morphological adaptations below).

Plot meets the hydrophytic vegetation criteria (DT & PI).

**SOIL**

Sampling Point: R-3

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10YR 5/1	90	10YR 3/4	10	C	M	sandy loam	
12-15	10YR 6/1	100					sandy loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No \_\_\_\_\_

Remarks:

Plot meets the hydric soil criteria (F3).



Photo 13 – Soil Sample at Plot R-3



Photo 14 – Vegetation at Plot R-3 looking northerly towards E. Beasley Ave.

**WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region**

Project/Site: Axis - Redfish Facility City/County: San Patricio Co. Sampling Date: 11/27/2018  
 Applicant/Owner: Axis Midstream Partners, LLC State: TX Sampling Point: R-4  
 Investigator(s): R. Ganczak & A. Snellgrove Section, Township, Range: NA  
 Landform (hillslope, terrace, etc.): levee slope Local relief (concave, convex, none): none Slope (%): 1  
 Subregion (LRR or MLRA): LRRT/150B Lat: 27.876506° Long: -97.157399° Datum: WGS 84  
 Soil Map Unit Name: Is - Ijam - rarely flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Plot taken on slope from road/levee fill. Shell debris visible.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<b>Secondary Indicators (minimum of two required)</b> <table style="width:100%; border: none;"> <tr><td style="border: none;"><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
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<b>Field Observations:</b> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  
**NRCS Soil Survey Data, Aerial Photography, NHD Data**

Remarks:  
 Plot does not meet the Hydrology Criteria .

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: R-4

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species <u>10</u> x 1 = <u>10</u> FACW species _____ x 2 = _____ FAC species <u>80</u> x 3 = <u>240</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>90</u> (A) <u>250</u> (B)  Prevalence Index = B/A = <u>2.8</u>
50% of total cover: _____		20% of total cover: _____		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>		
<b>Herb Stratum</b> (Plot size: <u>30'</u> )				
1. <u>Andropogon virginicus</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
2. <u>Pluchea foetida</u>	<u>10</u>	<u>No</u>	<u>OBL</u>	
3. <u>Iva annua</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
50% of total cover: <u>45</u>		20% of total cover: <u>18</u>		
<b>Woody Vine Stratum</b> (Plot size: <u>30'</u> )				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____		20% of total cover: _____		
Remarks: (If observed, list morphological adaptations below).				
Plot meets hydrophytic vegetation criteria (DT & PI).				



**SOIL**

Sampling Point: R-4

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-11	10YR 5/3	100					sandy loam	shell debris visible
11-15	10YR 7/2	100					sandy loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

Plot does not meet hydric soil criteria. Soil appears to contain fill material.