REVISED APPLICATION FOR A STANDARD DEPARTMENT OF THE ARMY SECTION 10 AND SECTION 404 PERMIT

Port of Corpus Christi Authority of Nueces County
Harbor Island Dock Construction
Nueces and Aransas Counties, Texas
Project # 6703180051.0002

Prepared for:

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Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

On behalf of Port of Corpus Christi Authority of Nueces County (PCCA), Wood Environment & Infrastructure Solutions, Inc. (Wood) is submitting this combined Section 10 and Section 404 Permit Application to the United States Army Corps of Engineers (USACE), Galveston District for the construction and dredging of two new marine berths to be constructed on Harbor Island, Corpus Christi, Texas located at the intersection of Aransas Channel and the Corpus Christ Ship Channel (CCSC) (**Figure 1** in **Appendix B**).

The Proposed Project includes the following major elements:

- Dredging/excavation to allow for the creation of Berth 1 and Berth 2 to a depth of -60 feet mean lower low water (MLLW) (-54 feet MLLW plus four feet of advanced maintenance and two feet of allowable over dredge);
- Construction of Berth 1 and 2; and
- The placement of the resulting dredge material at one of several potential dredge placement area(s).

1.1 Organization of this Document

This narrative is organized as follows:

Section 1.0 includes an Introduction (corresponding to Box No. 18 of the United States Army Corps of Engineers [USACE] engineering form 4345 (see **Appendix A**) - Application for Department of the Army Permit [ENG4345]).

Section 2.0 includes a description of the Proposed Project.

Section 3.0 contains a description of the Proposed Project area (corresponding to Box Nos. 19 to 22 on the ENG4345).

Section 4.0 contains permit evaluation policies.

Section 5.0 provides avoidance and minimization measures to be taken (corresponding to Box No. 23 on the ENG4345).

Section 6.0 contains a list of references.

Figures are included in **Appendix B** of this Section 10 and Section 404 permit application. **Appendix C** presents historic aerial photographs of Harbor Island. **Appendix D** provides a copy of the Code of Ordinances for Port Aransas, while **Appendix E** presents the Site Plans. **Appendix F** includes the Water and Sediment Sampling and Analysis Report on a CD as an insert; and **Appendix G** includes the Wetlands Delineation Report from the Harbor Island project area wetlands delineation. **Appendix H** presents the Consistency with the Texas Coastal Management Program Form, **Appendix I** presents a completed Tier II Certification Questionnaire and

Alternatives Analysis Checklist, **Appendix J** includes information on protected species on or near the site, **Appendix K** presents information on cultural resources, and **Appendix L** provides the names and addresses of adjacent land owners near the Proposed Project dredge and dredge material placement locations.

2.0 Project Description

PCCA is proposing the construction of two berths that require dredging and excavation along the southern portion of Harbor Island (the "Proposed Project"). The new docks will be a component of a crude oil export terminal to be constructed in association with the docks. The berth structures will consist of shoreline protection, including articulated block mat, bulkhead, cellular wall, breasting structures, jetty platforms, and access structures, etc. The two berths will be located inset at Harbor Island as depicted in (Site Plans in **Appendix E**). The two berths will be in an area currently occupied by three already-existing berths which are damaged and unusable and, which are in the process of being demolished (**Figure 2** in **Appendix B**). There are no potential adverse impacts expected as a result of construction activities associated with the proposed Project. The new berths will be dredged to a depth of -60 (MLLW) (-54 feet MLLW plus four feet of advanced maintenance and two feet of allowable over dredge) (to match the current authorized channel (corresponding to Box No. 18 on the ENG4345). The signed ENG 4345 is included as **Appendix A**.

Harbor Island has a long history of development and use as an oil terminal, having been utilized as a bulk storage terminal dating back to the 1950s. **Appendix C** contains historic aerials for the Harbor Island area going back to 1955. Harbor Island was formerly a terminal site for Exxon and Fina, but those assets were removed, and the Site cleaned up to commercial/industrial levels. Historic use by Exxon and Fina included tanker and barges visiting the Site. In 1996, PCCA gained ownership of Harbor Island. The two new dock facilities at Harbor Island will replace the aging existing dock infrastructure used in the past to accommodate oil tankers from Panamax to Aframax class vessels.

It is noted in addition to having been historically developed and disturbed, Harbor Island is zoned by the Port Aransas for a use consistent with that of an oil export facility. As detailed in the Port Aransas Code of Ordinances (**see Appendix D**), Section 25-121 (Sub-Section 1.b), Harbor Island development is restricted to non-dwelling, non-residential use, and such activities as light manufacturing, marine terminals, storage facilities for oil and gas, and offshore oil/gas support services. The proposed development is consistent with the Port Aransas zoning ordinances.

The Harbor Island terminal will be a full-service crude oil export facility with the ability to load Very Large Crude Carrier (VLCCs) ships. The facility will support a variety of pipeline customers. Crude will enter the facility from the south through incoming pipelines coming into the property from across Highway 361, as well as the right of way to Harbor Island. The crude will be pumped directly to the vessel from facilities located off the property. A large pump facility will load the ships at a flow rate of approximately 80,000 barrels per hour (bbl/hr) using a series of four loading arms. Two additional loading arms will remove vapor from the ships, which will be treated using vapor combustion units (VCUs). Two 50K barrels (bbl) surge tanks will be used for emergency shut off. A fire suppression system consisting of fire water and a foam system will protect the Terminal. The terminal will be controlled through a Distributed Control System (DCS) located in the Operations Building.

The associated proposed berths are referred to as Berths 1 and 2. Berth 1 and Berth 2 are located along the southeastern corner of Harbor Island on PCCA property, inset into the Island on an approximate 45-degree angle to the CCSC. The Proposed Project will generate approximately 6,500,000 CY of dredging and/or excavation including advance maintenance and allowable dredge over depth.

The CCSC currently ranges from 47 feet deep in the Lower Bay segment to 49 feet deep in the entrance channel and is authorized to a depth of 54 feet. The design depths are consistent with those authorized by the USACE and allow for efficient use of vessels planned to call at Harbor Island.

The ships will enter through the Aransas Channel west of Port Aransas, make a left into the CCSC and in front of the terminal will be turned 180 degrees and backed into the berths. Once loaded, the ships will be able to immediately enter the CSCC, line up with the Aransas Channel and exit to the Gulf of Mexico.

The Project area covers approximately 64.8 acres of terminal basin. Approximately 6.5 million cubic yards (CY) of material will be appropriately dredged, through hydraulic and/or mechanical excavation to create the two berths. In addition, a dredge slope of 3 horizontal (H) to 1 vertical (V) (3H:1V) will be required as a transition from the toe of the dredge and daylight on Harbor Island to form the external boundary of the berths. The sloped areas will be protected with articulated block mat (ABM). Additionally, the areas to the north and south will be protected with approximately 725 feet bulkhead and approximately 1,275 feet cellular wall structure, respectively.

Impacts to the waters of the United States (WOTUS) will be permanent. A survey was conducted to evaluate the potential for adverse impacts to aquatic resources as a result of construction activities associated with the proposed Project. Upon desktop review of aerial imagery, bathymetry, and salinities in the Project area, it was determined that the survey area had no potential for special aquatic habitats. However, field sampling was conducted to verify. WOTUS boundaries and habitat impacts, including sample locations for seagrass and oysters, are shown in **Figure 3** in **Appendix B**.

A map showing adjacent property owners is included as **Figure 4a** and **4b** in **Appendix B** (corresponding to Box No 25. on the ENG4345).

2.1 Project Purpose

The purpose of the Proposed Project is to provide the necessary dock and berthing facilities to support vessel engagement with the loading, unloading, transportation, and exploring of petroleum and other bulk products via waterborne commerce. Construction of the Proposed Project would provide the facilities necessary to integrate existing and future barge, pipeline, and storage infrastructure to maximize product handling efficiencies (corresponding to Box No. 19 on the ENG4345).

The project is designed to accommodate the safe and efficient transit of vessels. A current authorization will provide two-way marine traffic in the CCSC at a depth of -54 ft MLLW from the Gulf of Mexico to the Ferry landing. The Proposed Project will complement this authorization, providing updated modern marine berths immediately adjacent to the newly deepened navigation channel. This will replace the existing dilapidated berths which are unusable and not sized appropriately for today's vessel fleet. Once completed, the CCSC would be the first Texas port to have a channel and associated marine berths with a depth of over 50 feet. The resulting Proposed Project will provide global access to the crude oil export market, and more efficiency for vessels. The Proposed Project will be fed by product being shipped via existing and future pipeline infrastructure.

Economic efficiency would result from the passage of large ships through the CCSC that previously had to remain offshore and transfer cargo into smaller crude tankers. Vessel delays and the potential for accidents would also be reduced (USACE 2003).

2.2 Project Construction

The following section discusses aspects of the Proposed Project construction as it relates to schedule.

2.2.1 Dredging

The dredge passes are anticipated to start near the shoreline, and progressively move towards deeper water. The dredged material is anticipated to be primarily sand in texture. A geographical positioning system (GPS) will be used to ensure the proper positioning of the dredging equipment. With each sediment grab, the dredge bucket will be swung directly to a transport barge upon breaking the water surface. Bottom stockpiling, over-filling the dredge bucket, or multiple bites of the dredge will not be performed, and sediment containment measures will be employed to minimize spillage. A turbidity curtain, surface booms, oil-absorbent pads, and similar environmental containment materials and supplies will be kept on site to be immediately deployed as necessary.

All work will be performed during an approved in-water work window as specified by federal and state regulatory agencies.

At the dredged material disposal site, the material will be hydraulically pumped to raise the containment dike, if needed, at the placement area and fill the interior. If needed, rip-rap or other stone may be added to the dike where additional armoring is needed. If not already completed, dike side slopes will be seeded as soon as practicable to promote stability. **Table 2-1** below summarizes the placement capacity of the dredge material placement areas. The total amount of dredge material to place is 6,500,000 CY.

Table 2-1
Dredge Material Placement Area Capacity

Placement Option	Placement Capacity (CY)
M3	4,328,400
M9	3,500,000
M10	10,933,600
PA6	3,704,900
PA4	3,020,000

2.2.2 Construction Sequencing and Approaches

It is anticipated that the construction will be conducted through the completion of the following steps:

- Piles (shore-based, including steel pipe piles for equipment foundations, mooring dolphins, wall anchors, and bulkhead sheet piles);
- Dredging – Executed with dredging vessel that is the same or similar as currently being used for channel maintenance;
- Piles for Loading Platform – barge-mounted or floating pile driving rig;
- Structural steel erection for Loading Platform;
- Erect loading arms;
- Erect and interconnect module piping, electrical, and instrumentation systems; and
- Commissioning and Start-up.

3.0 Description of the Project Area

This section presents physical descriptions of the Proposed Project area and the natural resources on and around the Proposed Project area.

3.1 Project Location

PCCA is proposing to construct the new berths located at Harbor Island on property located in Nueces County, Texas. The two berths are located inset into Harbor Island along the entrance channel and lower bay segments of the CCSC between Station 40+00 to Station 70+00.

It is anticipated that the dredged and excavated material generated by this Proposed Project will be placed in one of several potential dredge placement area(s) show on **Figure 5** in **Appendix B** (corresponding to Box No 20. on the ENG4345).

3.2 Ecological Characteristics

The following sections describe the baseline ecological characteristics of the Project Area.

3.2.1 Geology and Soils

The site is located within the Coastal Prairies subprovince to the larger Gulf Coastal Plains Physiographic Province of Texas. The Gulf Coastal Plains Province covers approximately one quarter of the State of Texas, increasing in elevation northward and westward from sea level at the Gulf of Mexico, up to an elevation of about 1,000 feet at its western end. The Coastal Prairies subprovince begins at the Gulf of Mexico shoreline and is composed of young deltaic sands, silts, and clays that erode to nearly flat grasslands, forming almost imperceptible slopes to the southeast. In areas where the subsidence of deltaic sediments occurs along fault lines, minor steeper slopes result from one foot to as much as nine feet high (BEG 1996).

The rock unit at Harbor Island is dominated by predominately fill and spoil. These soils include; (1) fill; material dredged for raising land surface above Alluvium and Barrier Island Deposits and creating land and (2) spoil; dredged material forming islands along waterways. Their properties are highly variable mixed mud, silt, sand, and shell; mud and silt winnowed when reworked (USGS 2019a; USGA 2019b). Areas bordering Harbor Island include the above-mentioned rock unit fill and spoil and also Alluvium. These soils are Alluvium and Low Terrace deposits along streams, sand, silt, clay, and gravel. They were deposited on the lagoon side of barrier islands where they represent lagoon and wind-tidal-flat sand and clay and can range in varying thickness. These soils of clay and silty, clayey fine to very fine quartz sand and shell sand accumulate on alternately dry and flooded barren flats 0.3 meter below to 1 meter above mean sea level (USGA 2019a; USGA 2019c).

The site is mapped to occur on Mustang fine sand (Mu) surficial soils which are surrounded by water (USDA 2019). Mustang fine sand consists of very deep, poorly drained, very low permeable soils that formed in sandy eolian and storm washover sediments. These nearly level soils are on planar to concave barrier island flats. These soils are subject to occasional flooding by high storm surge from strong tropical storms and are ponded after periods of heavy rainfall. Slope ranges from 0 to 1 percent.

3.2.2 Water Quality

According to TCEQ (2016), the Texas Surface Water Quality Standards, as codified by rule in the Texas Administrative Code (TAC), Title 30, Chapter 307, were developed and are administered in conformance with requirements of the Federal Water Pollution Control Act (33 U.S.C. §1251 et seq.), also called the Clean Water Act (CWA), and pursuant to the Texas Water Code (TWC). These Surface Water Quality Standards establish antidegradation policies, designate water uses, define and apply stream classifications, and develop water quality criteria for the purpose of maintaining water quality in the State consistent with public health and enjoyment, propagation and protection of terrestrial and aquatic life, and the operation of existing industries, taking into consideration economic development of the State.

The waters along the southern and southeastern shores of Harbor Island are contained within the geographic extent of the State's classified "Corpus Christi Bay" segment, which extends from the CCSC east to Pelican Island, from Pelican Island south to Demit Island including the La Quinta Channel and the CCSC (TCEQ 2016).

The bays surrounding the Proposed Project area, including Corpus Christi Bay, Redfish Bay, Nueces Bay, and Aransas Bay, have been designated for Primary Contact Recreation 1 activities, which are activities presumed to involve a significant risk of ingestion of water (e.g., wading by children, swimming, water skiing, diving, tubing, surfing, handfishing as defined by Texas Parks and Wildlife (TPWD) Code, §66.115, and the following whitewater activities: kayaking, canoeing, and rafting). They have also been qualified as belonging in the both Exceptional Aquatic Life Use and Oyster Waters category (TCEQ 2018).

The habitat characteristics of waters that qualify within the Exceptional Aquatic Life Use category have outstanding natural variability, with exceptionally high species diversity and species richness, and an exceptional or unusual species assemblage with a balanced trophic structure. Sensitive species may also be abundant in Exceptional Aquatic Life Use category waters. The criteria set forth for these waters include a mean dissolved oxygen level of 5.0 milligrams per liter (mg/L), a pH range of 6.5 to 9.0, a mean indicator bacterium count of 35/14 bacteria per 100 milliliters (mL) of water (in terms of colony forming units or other applicable reporting measures), and a maximum temperature of 95 degrees Fahrenheit (°F). The characteristics of waters that qualify as oyster waters have waters producing edible species of clams, oysters, or mussels. (TCEQ 2018).

Section 303(d) of the CWA requires states to prepare a list of impaired waters based on Total Maximum Daily Loads (TMDLs) of pollutants and to specify corrective actions. Based on the 303(d) list for Texas, there are several impaired areas in Nueces County, including Corpus Christi Bay (southwest of the Proposed Project area) for high levels of bacteria in their recreational beaches.

Nueces Bay and Corpus Christi Inner Harbor have also been classified as impaired due to high levels of copper in the water (TCEQ 2016). Temporary degraded surface water quality in the area has intermittently resulted from urban runoff/storm serves, non-point source pollution, municipal point source discharges, drought-related impacts, and point source pollution (TCEQ, 2014). Channel construction and channelization of natural waterways have also facilitated saltwater moving further inland than what has occurred historically, or what would occur under natural conditions (USACE 2018b).

In addition, the CCSC has undergone several modifications and maintenance-dredging operations. Channel dredging occurred in 1926 to deepen the channel to 25 feet, in 1930 to deepen the channel 30 feet, in 1936 to deepen the channel to 32 feet, in 1943 to deepen the channel to 34 feet, in 1965 to deepen the channel to 40 feet, and in 1976 to deepen the channel to 45 feet (USACE 2018a). Historically, the maintenance-dredging frequency for the CCSC is approximately 2.1 years, with an average of approximately 1,377,887 CY (USACE 2008). The CCSC has a draft of 47 feet and is authorized and permitted for 54 feet below MLLW from the Gulf of Mexico to Harbor Island. The Corpus Christ Ship Channel Improvement Project is the Congressionally authorized project to deepen and widen the Port's 47-foot channel to a depth of 54 feet from the Gulf of Mexico to the Viola Turning Basin in the Inner Harbor, and to extend the existing 47 foot La Quinta Ship Channel 1.4 miles at a depth of 43 feet to the Port's La Quinta Multi-Purpose Facility, which was completed in 2012 (PCC 2019).

3.2.3 Sediment Characteristics

In February 2019, Wood implemented a sediment characterization study. Sediment samples were collected for submerged aquatic vegetation, grain size, total organic carbon (TOC), and benthic macroinvertebrates to characterize local substrate. Water measurements and sampling consisted of current water velocity and water quality data. Plankton samples were collected. The plankton sample results identified the abundances and diversity of adult and larval marine species found within the water column. Oyster and seagrass surveys were also conducted to determine presence or absence of these habitats, and the extent of them if present.

The sediment sampled was visually characterized as predominantly fine sand with silt and clay present. The color of the sediment was predominantly gray with some samples containing a black clay and had no odor. Shell hash was also observed in several samples.

Coarse gravel ranged from 0.0% to 1.2%, fine gravel from 0.0% to 59.6%, coarse sand from 0.0% to 8.9%, medium sand from 0.1% to 6.8%, fine sand from 32.1% to 95.6%, silt from 2.0% to 53.1%, and clay from 1.5% to 16.3%. Sediment samples from three locations (not geographically close) were the only samples to contain gravel which was identified in the field as shell or shell hash.

The full Water and Sediment Sampling and Analysis Report can be found in **Appendix F**.

3.2.4 Wetlands

The CWA defines wetlands as:

> *"those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

Using that definition, wetlands are defined based on certain characteristics of plants, soils, and hydrology. For vegetation, the majority of the plant species must be categorized as hydrophytic or adapted to living in saturated areas. Soils are considered hydric if they meet the criteria defined by the National Technical Committee for Hydric Soils. Hydrology is determined based on having a sufficient amount of water, whether saltwater, brackish, or fresh, that the soil is saturated during long periods of the vegetative growing season.

The most common means of characterizing wetlands is under the system developed by the United States Fish and Wildlife Service (USFWS). As described in their Classification of Wetlands and Deepwater Habitats of the United States (USFWS 1992), wetland types can be broken down into five basic categories. These categories include marine, estuarine, riverine, lacustrine and palustrine wetlands. The major categories or systems are based mostly on the hydrologic base for the wetlands. Each of these systems can be further broken down into subsystems, classes, subclasses, and dominance types based on the type of vegetation present and/or the bottom substrate for the wetlands.

According to the USFWS' National Inventory Mapper (NWI) website (USFWS 2019a), there is a palustrine, emergent, persistent (temporary flooded, diked/impound) wetland community located in the central portion on Harbor Island. The waterways surrounding the island (e.g., the Aransas Channel, Lydian Ann Channel, and the CCSC), however, are classified as estuarine, subtidal, unconsolidated bottom, subtidal (E1UBL) communities by the USFWS.

A field wetland delineation was performed by Wood on March 19, 2019. The results of this delineation indicated the presence of two small wetland communities (**Figure 6** in **Appendix B**). These wetland communities are dominated by cone-cup spikerush (*Eleocharis tuberculosa*) and torpedo grass (*Panicum repens*) in the herb layer. It is anticipated that the Proposed Project will disturb two delineated wetlands along the north central portion of the terminal area boundary. The first wetland is described as a palustrine emergent wetland that is a small drainage depression adjacent to a parking area, approximately 0.0184 acres in size. The second wetland is described as a palustrine emergent wetland approximately 0.312 acres in size. No other wetlands are anticipated to be disturbed by the project. The Wetlands Delineation Report is included in **Appendix G**.

As mentioned in **Section 2.0**, based on a desktop review, it was determined that the survey area for the proposed Project had no potential for special aquatic habitat. Approximately 6.5 million CY of material will be dredged and/or mechanically excavated (corresponding to Box No. 22 on the ENG4345).

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3.2.5 Biological Resources

This section describes the biological resources on and around the Proposed Project area.

3.2.5.1 Marine Resources (Fish, Shellfish, and EFH)

The area around the Proposed Project contains numerous islands, saltwater marshes, channels and shallow flats. Common fish species within this area include: alligator gar (*Atractosteus spatula*), Atlantic needlefish (*Strongylura marina*), bigmouth sleeper (*Gobiomorus dormitory*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*), gizzard shad (*Dorosoma cepedianum*), hardhead catfish (*Ariopsis fleis*), hogchoker (*Trinectes maculatus*), inland silverside (*Menidia veryllina*), largemouth bass (*Micropterus salmoides*), mountain mullet (*Agonostomus monticola*), rainwater killifish (*Lucania parva*), red shiner (*Cyprinella lutrensis*), sheepshead minnow (*Cyprinodon variegatus*), and yellow bullhead (*Ameiurus natalis*). Popular areas for fishing in the Texas Coastal Bend include the Corpus Christi Bay, Redfish Bay, Estes Flats, Lighthouse Lakes, Aransas Channel, and CCSC. The shallow, grassy flats of Estes flats are well known for trout (Salmonidae) and redfish, also known as red drum, year-round. Lydia Ann Channel and the CCSC are known spots for flounder (Pleuronectoidei) during their fall migration. The Aransas Channel contains fish species such as redfish, trout, flounder, drum (Sciaenidae), sand trout (*Cynoscion arenarius*), and sheepshead. Lighthouse Lakes is a series of open flats, channels, and sloughs known for trout, flounder, and schools of redfish. Common species at the Port Aransas south jetty are trout, redfish, pompano (*Trachinotus* sp.), black drum (*Pogonias cromis*), Spanish mackerel (*Scomberomorus maculatus)*, sharks (Euselachii), jack crevalle (*Caranx hippos*), tarpon (*Megalops* sp.), and sheepshead.

The fishing resources of this bay system include many fish species preferred by sport fishermen (TSG 2016). Common species present include spotted seatrout (*Cynoscion nebulosus*), various flounders (*Paralichthys* spp.), redfish (*Sciaenops ocellatus*), snappers (*Lutjanidae* spp.), king mackeral (*Scomberomorus cavalla*), black drum (*Pogonias cromis*), and Spanish mackerel.

The shellfish resources of this estuary system include the following species (CBBEP 2003)

- Blue crab (*Callinectes sapidus*),
- American oyster (*Crassostrea virginica*),
- Dwarf surf clam (*Mulinia lateralis),*
- White shrimp (*Litopenaeus setiferus*),
- Brown shrimp (*Farfantepenaeus aztecus*), and
- Pink shrimp (*Farfantepenaeus duorarum*).

Oyster reefs are found in both Corpus Christi Bay and Redfish Bay; however, most oyster reefs in Corpus Christi Bay were found to be dead (CCNEP 1996). None are known to exist within the dredge area.

Amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) were enacted by Congress in 1996, which established procedures for identifying

Essential Fish Habitat (EFH) and required interagency coordination to further the conservation of federally managed fisheries. These habitats are necessary for spawning, breeding, feeding, or growth of the species, and are managed under Regional Fishery Management Councils, as described in a series of Fishery Management Plans (FMPs).

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) EFH mapper (NOAA, 2019) was consulted to determine which fish species habitat is mapped within the Proposed Project area boundaries to assess the potential of being affected by the Proposed Project. It was determined that the EFH within the Proposed Project area is managed under five separate FMPs regulated by the Gulf of Mexico Fishery Management Council. Those management plans were reviewed to determine which specific species and life stages have the potential to be found within the Proposed Project boundaries. The results of this review are listed in **Table 3-1** below:

Table 3-1
Essential Fish Habitat Within the Project Area

Common Name	Scientific Name	Likely to be Present in Project Area	Life Stage(s) Present in Project Area	Habitat(s) Used in Project Area	Managed Under
Red drum	*Sciaenops ocellatus*	Yes	Larvae, juvenile	Soft bottom and/or water column	Red Drum FMP
Gray triggerfish	*Balistes capriscus*	No	NA	NA	Reef Fish FMP
Greater amberjack	*Seriola dumerili*	No	NA	NA	Reef Fish FMP
Lesser amberjack	*Seriola fasciata*	No	NA	NA	Reef Fish FMP
Almaco jack	*Seriola rivoliana*	No	NA	NA	Reef Fish FMP
Banded rudderfish	*Seriola zonata*	No	NA	NA	Reef Fish FMP
Hogfish	*Lachnolaimus maximus*	No	NA	NA	Reef Fish FMP
Queen snapper	*Etelis oculatus*	No	NA	NA	Reef Fish FMP
Mutton snapper	*Lutjanus analis*	No	NA	NA	Reef Fish FMP
Schoolmaster snapper	*Lutjanus apodus*	Yes	Juvenile, adult	Soft bottom	Reef Fish FMP
Blackfin snapper	*Lutjanus buccanella*	No	NA	NA	Reef Fish FMP
Red snapper	*Lutjanus campechanus*	No	NA	NA	Reef Fish FMP

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Table 3-1
Essential Fish Habitat Within the Project Area

Common Name	Scientific Name	Likely to be Present in Project Area	Life Stage(s) Present in Project Area	Habitat(s) Used in Project Area	Managed Under
Cubera snapper	*Lutjanus cyanopterus*	No	NA	NA	Reef Fish FMP
Gray (mangrove) snapper	*Lutjanus griseus*	Yes	Juvenile, adult	Soft bottom, sand/shell and/or water column	Reef Fish FMP
Dog snapper	*Lutjanus jocu*	Yes	Juvenile, adult	Water column	Reef Fish FMP
Mahogany snapper	*Lutjanus mahogoni*	No	NA	NA	Reef Fish FMP
Lane snapper	*Lutjanus synagris*	Yes	Larvae, juvenile	Soft bottom, sand/shell and/or water column	Reef Fish FMP
Silk snapper	*Lutjanus vivanus*	No	NA	NA	Reef Fish FMP
Yellowtail snapper	*Ocyurus chrysurus*	No	NA	NA	Reef Fish FMP
Wenchman	*Pristipomoides aquilonaris*	No	NA	NA	Reef Fish FMP
Vermilion snapper	*Rhomboplites aurorubens*	No	NA	NA	Reef Fish FMP
Goldface tilefish	*Caulolatilus chrysops*	No	NA	NA	Reef Fish FMP
Blackline tilefish	*Caulolatilus cyanops*	Yes	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Anchor tilefish	*Caulolatilus intermedius*	No	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Blueline tilefish	*Caulolatilus microps*	No	NA	NA	Reef Fish FMP
(Golden) Tilefish	*Lopholatilus chamaeleonticeps*	No	NA	NA	Reef Fish FMP

Table 3-1
Essential Fish Habitat Within the Project Area

Common Name	Scientific Name	Likely to be Present in Project Area	Life Stage(s) Present in Project Area	Habitat(s) Used in Project Area	Managed Under
Dwarf sand perch	*Diplectrum bivittatum*	Yes	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Sand perch	*Diplectrum formosum*	No	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Rock hind	*Epinephelus adscensionis*	Yes	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Speckled hind	*Epinephelus drummondhayi*	No	NA	NA	Reef Fish FMP
Yellowedge grouper	*Epinephelus flavolimbatus*	No	NA	NA	Reef Fish FMP
Red hind	*Epinephelus guttatus*	Yes	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Goliath grouper	*Epinephelus itajara*	Yes	Juvenile	Water column	Reef Fish FMP
Red grouper	*Epinephelus morio*	No	NA	NA	Reef Fish FMP
Misty grouper	*Epinephelus mystacinus*	No	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Warsaw grouper	*Epinephelus nigritus*	No	NA	NA	Reef Fish FMP
Snowy grouper	*Epinephelus niveatus*	No	NA	NA	Reef Fish FMP
Nassau grouper	*Epinephelus striatus*	Yes	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Marbled grouper	*Epinephelus inermis*	No	Larvae, juvenile, adult	Soft bottom and/or water column	Reef Fish FMP
Black grouper	*Mycteroperca bonaci*	No	NA	NA	Reef Fish FMP

wood.

Table 3-1
Essential Fish Habitat Within the Project Area

Common Name	Scientific Name	Likely to be Present in Project Area	Life Stage(s) Present in Project Area	Habitat(s) Used in Project Area	Managed Under
Yellowmouth grouper	*Mycteroperca interstitialis*	No	NA	NA	Reef Fish FMP
Gag	*Mycteroperca microlepis*	No	NA	NA	Reef Fish FMP
Scamp	*Mycteroperca phenax*	No	NA	NA	Reef Fish FMP
Yellowfin grouper	*Mycteroperca venenosa*	No	NA	NA	Reef Fish FMP
King mackerel	*Scomberomorus cavalla*	No	NA	NA	Coastal Migratory Pelagic Resources (Mackerels)
Spanish mackerel	*Scomberomorus maculatus*	No	NA	NA	Coastal Migratory Pelagic Resources (Mackerels)
Cobia	*Rachycentron canadum*	Yes	Eggs, larvae	Water column	Coastal Migratory Pelagic Resources (Mackerels)
Brown shrimp	*Penaeus aztecus*	Yes	Larvae, juvenile, sub-adult	Soft bottom, sand/shell and/or water column	Shrimp FMP
White shrimp	*Penaeus setiferus*	Yes	Eggs, larvae, juvenile, adult	Soft bottom and/or water column	Shrimp FMP
Pink shrimp	*Penaeus duorarum*	Yes	Larvae, juvenile, adult	Soft bottom, sand/shell and/or water column	Shrimp FMP
Royal Red shrimp	*Pleoticus robustus*	No	NA	NA	Shrimp FMP
Bull shark	*Carcharhinus leucas*	Yes	Neonate, juvenile, adult	Water column	Highly Migratory FMP
Spinner shark	*Carcharhinus brevipinna*	Yes	Neonate	Water column	Highly Migratory FMP

Table 3-1
Essential Fish Habitat Within the Project Area

Common Name	Scientific Name	Likely to be Present in Project Area	Life Stage(s) Present in Project Area	Habitat(s) Used in Project Area	Managed Under
Lemon shark	*Negaprion brevirostris*	Yes	Neonate, juvenile	Water column	Highly Migratory FMP
Sailfish	*Istiophorus albicans*	Yes	Juvenile, adult	Water column	Highly Migratory FMP
Scalloped hammerhead shark	*Sphyrna lewini*	Yes	Neonate	Water column	Highly Migratory FMP
Blacktip shark (Gulf of Mexico stock)	*Carcharhinus limbatus*	Yes	Neonate	Water column	Highly Migratory FMP
Atlantic sharpnose shark (Gulf of Mexico stock)	*Rhizoprionodon terraenovae*	Yes	Neonate, juvenile, adult	Water column	Highly Migratory FMP
Bonnethead shark (Gulf of Mexico stock)	*Sphyrna tiburo*	Yes	Neonate, juvenile, adult	Water column	Highly Migratory FMP
Finetooth shark	*Carcharhinus isodon*	Yes	Neonate, juvenile, adult	Water column	Highly Migratory FMP

There were no Habitat Areas of Particular Concern (HAPCs) found within the Proposed Project area boundaries (NOAA 2019).

Although there is fish species habitat mapped within the Proposed Project boundaries, the surrounding area is periodically dredged. The Proposed Project will not have adverse long-term environmental impacts to fish or shellfish species, or their habitat. Any behavioral responses by wildlife (e.g., startle response and/or brief avoidance behavior) generated from the Proposed Project are expected to be temporary in nature and a return to baseline behavior is expected immediately following exposure.

3.2.5.2 Birds

The USFWS' online Information, Planning, and Conservation (IPaC) system (USFWS 2019b) was consulted to determine which migratory birds, protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA), could potentially be moving through the dredge location or the dredge material placement area(s). The results indicated the presence of the following 40 species (see **Table 3-2** below and **Appendix J**):

Table 3-2
Potential Migratory Bird Species On or Near the Project Site

Common Name	Scientific Name
American Golden Plover	*Pluvialis dominica*
American Oystercatcher	*Haematopus palliatus*
Black Skimmer	*Rynchops niger*
Black-Legged Kittiwake	*Riss tridactyla*
Bonaparte's Gull	*Chroicocephalus philadelphia*
Brown Pelican	*Pelecanus occidentalis*
Buff-Breasted Sandpiper	*Calidris subruficollis*
Clapper Rail	*Rallus crepitans*
Common Loon	*Gavia immer*
Common Tern	*Sterna hirundo*
Double-Crested Cormorant	*Phalacrocorax auritus*
Dunlin	*Calidris alpina arcticola*
Gull-Billed Tern	*Gelochelidon nilotica*
Herring Gull	*Larus argentatus*
Hudonsian Godwit	*Limosa haemastica*
King Rail	*Rallus elegans*
Le Conte's Sparrow	*Ammodramus leconteii*
Least Tern	*Sterna antillarum*
Lesser Yellowlegs	*Tringa flavipes*
Long-Billed Curlew	*Numenius americanus*
Magnificent Frigatebird	*Fregata magnificens*
Marbled Godwit	*Limosa fedoa*
Nelson's Sparrow	*Ammodramus nelsoni*
Northern Gannet	*Morus bassanus*
Prothonotary Warbler	*Protonotaria citrea*
Red-Breasted Merganser	*Mergus serrator*

Table 3-2
Potential Migratory Bird Species On or Near the Project Site

Common Name	Scientific Name
Red-Necked Phalarope	*Phalaropus lobatus*
Reddish Egret	*Egretta rufescens*
Ring-Billed Gull	*Laurus delawarensis*
Royal Tern	*Thalasseus maximus*
Ruddy Turnstone	*Arenaria interpres morinella*
Seaside Sparrow	*Ammodramus maritimus*
Semipalmated Sandpiper	*Calidris pusilla*
Short-Billed Dowitcher	*Limnodromus griseus*
Swallow-tailed Kite	*Elanoides forficatus*
Whimbrel	*Numenius phaeopus*
White-winged Scoter	*Melanitta fusca*
Willet	*Tringa semipalmata*
Wilson's Plover	*Charadrius wilsonia*

Table 3-3 below lists bird species that are considered common for one or more seasons at the nearby Mustang Island State Park (TPWD 2010).

Table 3-3
Other Potential Bird Species On or Near the Project Site

Common Name	Scientific Name
American Avoset	*Recurvirostra americana*
American Coot	*Fulica americana*
American Kestrel	*Falco sparverius*
American Pipit	*Anthus rubescens*
American Wigeon	*Mareca americana*
American White Pelican	*Pelecanus erythrorhynchos*
Baltimore Oriole	*Icterus galbula*
Bank Swallow	*Riparia*
Barn Swallow	*Hirundo rustica*

Table 3-3
Other Potential Bird Species On or Near the Project Site

Common Name	Scientific Name
Black-And-White Warbler	*Mniotilta varia*
Black-Bellied Plover	*Pluvialis squatarola*
Black-Necked Stilt	*Himantopus mexicanus*
Black Tern	*Chlidonias niger*
Black-Throated Green Warbler	*Setophaga virens*
Blue-Gray Gnatcatcher	*Polioptila caerulea*
Blue Grosbeak	*Passerina caerulea*
Blue-Winged Teal	*Anas discors*
Brown-Headed Cowbird	*Molothrus ater*
Bufflehead	*Bucephala albeola*
Caspian Tern	*Hydroprogne caspia*
Cattle Egret	*Bubulcus ibis*
Chimney Swift	*Chaetura pelagica*
Chipping Sparrow.	*Spizella passerina*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Nighthawk	*Chordeiles minor*
Common Yellowthroat	*Geothlypis trichas*
Dickcissel	*Spiza americana*
Eared Grebe	*Podiceps nigricollis*
Eastern Kingbird	*Tyrannus*
Eastern Meadowlark	*Sturnella magna*
Eastern Phoebe	*Sayornis phoebe*
Eastern Wood-Pewee	*Contopus virens*
European Starling	*Sturnus vulgaris*
Forster's Tern	*Sterna forsteri*
Gadwall	*Anas strepera*
Gray Catbird	*Dumetella carolinensis*
Great Blue Heron	*Ardea herodias*
Great Egret	*Ardea alba*

Table 3-3
Other Potential Bird Species On or Near the Project Site

Common Name	Scientific Name
Great-Tailed Grackle	*Quiscalus mexicanus*
Greater Yellowlegs	*Tringa melanoleuca*
Green Heron	*Butorides virescens*
Green-Winged Teal	*Anas carolinensis*
House Sparrow	*Passer domesticus*
Indigo Bunting	*Passerina cyanea*
Killdeer	*Charadrius vociferus*
Laughing Gull	*Leucophaeus atricilla*
Least Flycatcher	*Empidonax minimus*
Least Sandpiper	*Calidris minutilla*
Lesser Scaup	*Aythya affinis*
Lincoln's Sparrow	*Melospiza lincolnii*
Loggerhead Shrike	*Lanius ludovicianus*
Long-Billed Dowitcher	*Limnodromus scolopaceus*
Marbled Godwit	*Limosa fedoa*
Marsh Wren	*Cistothorus palustris*
Mottled Duck	*Anas fulvigula*
Mourning Dove	*Zenaida macroura*
Neotropic Cormorant	*Phalacrocorax brasilianus*
Northern Harrier	*Circus hudsonius*
Northern Mockingbird	*Mimus polyglottos*
Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*
Northern Shoveler	*Anas clypeata*
Northern Pintail	*Anas acuta*
Orange-Crowned Warbler	*Vermivora celata*
Orchard Oriole	*Icterus spurius*
Osprey	*Pandion haliaetus*
Pied-Billed Grebe	*Podilymbus podiceps*
Piping Plover	*Charadrius melodus*

Table 3-3
Other Potential Bird Species On or Near the Project Site

Common Name	Scientific Name
Purple Marten	*Progne subis*
Redhead	*Aythya americana*
Red-Winged Blackbird	*Agelaius phoeniceus*
Red Knot	*Calidris canutus*
Rock Pigeon	*Columba livia*
Roseate Spoonbill	*Platalea ajaja*
Ruby-Crowned Kinglet	*Regulus calendula*
Ruby-Throated Hummingbird	*Archilochus colubris*
Ruddy Duck	*Oxyura jamaicensis*
Sanderling	*Calidris alba*
Sandwich Tern	*Thalasseus sandvicensis*
Savannah Sparrow	*Passerculus sandwichensis*
Scissor-Tailed Flycatcher	*Tyrannus forficatus*
Sedge Wren	*Cistothorus stellaris*
Snowy Egret	*Egretta thula*
Solitary Sandpiper	*Tringa solitaria*
Spotted Sandpiper	*Actitis macularius*
Swainson's Thrush	*Catharus ustulatus*
Swamp Sparrow	*Melospiza georgiana*
Tennessee Warbler	*Leiothlypis peregrina*
Tree Swallow	*Tachycineta bicolor*
Tricolored Heron	*Egretta tricolor*
Turkey Vulture	*Cathartes aura*
Virginia Rail	*Rallus limicola*
Western Sandpiper	*Calidris mauri*
White-Tailed Hawk	*Geranoaetus albicaudatus*
Wilson's Snipe	*Gallinago delicata*
Wilson's Warbler	*Cardellina pusilla*
Yellow-Billed Cuckoo	*Coccyzus americanus*

Table 3-3
Other Potential Bird Species On or Near the Project Site

Common Name	Scientific Name
Yellow-Breasted Chat	*Icteria virens*
Yellow-Rumped Warbler	*Setophaga coronata*
Yellow Warbler	*Setophaga petechia*

Although these bird species have the possibility of occurring near the Proposed Project area, the Proposed Project boundaries, dredge location or the dredge material placement area(s), and Harbor Island in general, the Proposed Project boundaries provide no suitable foraging, resting, nesting, watering, or breeding habitat for birds. The dredge site is located within open water containing the CCSC which is frequently used by commercial ships. The island land use is entirely industrial; therefore, the only birds likely to be found within the Proposed Project boundaries are those adapted to utilizing areas affected by frequent human disturbance, such as the herring, ring-billed, and laughing gulls.

3.2.5.3 Mammals

The Texas Gulf Coast is home to white-tailed deer (*Odocoileus virginianus*), badger (*Taxidea taxus*), jackrabbit (*Lepus californicus*), the bottle nosed porpoise (*Tursiops truncatus*), coyote (*Canis latrans*), marsh rice rat (*Oryzomys palustris*), muskrat (*Ondatra zibethicus*), nutria (*Myocastor coypus*), mink (*Neovison vison*), river otter (*Lontra canadensis*), raccoon (*Procyon lotor*), swamp rabbit (*Sylvilagus aquaticus*), eastern cottontail (*Sylvilagus floridanus*), and feral hog (*Sus scrofa*) (TPWD 2009).

Although these species have the possibility of occurring near the Proposed Project area, dredge location or the dredge material placement area(s), the Proposed Project boundaries provide no suitable foraging, denning, watering, or breeding habitat for mammals. The island land use is entirely industrial, therefore, the only mammals likely to be found within the Proposed Project boundaries are those adapted to utilizing areas affected by frequent human disturbance, such as brown rat (*Rattus rattus*).

3.2.5.4 Reptiles and Amphibians

Nueces County is home to an array of 12 species of turtles, 2 species of salamanders, 14 anurans (frogs and toads), 13 species of lizards, and 29 species of snakes. Some of the common species are listed in **Table 3-4** below. Nueces County also includes a population of the American alligator (*Alligator mississippiensis*) (HOT 2019).

Table 3-4
Potential Reptile and Amphibian Species On or Near the Project Site

Common Name	Scientific Name
Diamond-Backed Terrapin	*Malaclemys terrapin*
Eastern Mud Turtle	*Kinosternon subrubrum,*
Green Sea Turtle	*Chelonia mydas*
Hawksbill Sea Turtle	*Eretmochelys imbricate*
Leatherback Sea Turtle	*Dermochelys coriacea*
Loggerhead Sea Turtle	*Caretta caretta*
Ornate Box Turtle	*Terrapene ornata*
Pond Slider	*Trachemys scripta*
Snapping Turtle	*Chelydra serpentina*
Spiny Softshell Turtle	*Apalone spinifera,*
Texas Tortoise	*Gopherus berlandieri*
Yellow Mud Turtle	*Kinosternon flavescens*
Checkered Gartersnake	*Thamnophis marcianus*
Coachwhip	*Masticophis flagellum*
Common Kingsnake	*Lampropeltis splendida*
Cottonmouth	*Agkistrodon piscivorus*
Dekay's Brownsnake	*Storeria dekayi*
Diamond-Backed Watersnake	*Nerodia rhombifer*
Eastern Hog-Nosed Snake	*Heterodon platirhinos*
Eastern Patch-Nosed Snake	*Salvadora grahamiae*
Eastern Racer	*Coluber constrictor*
Eastern Ratsnake	*Pantherophis obsoletus*
Flat-Headed Snake	*Tantilla gracilis*
Glossy Snake	*Arizona elegans*
Gophersnake	*Pituophis catenifer*
Great Plains Ratsnake	*Pantherophis emoryi*
Groundsnake	*Sonora semiannulata*
Indigo Snake	*Drymarchon m. erebennus*
Long-Nosed Snake	*Rhinocheilus lecontei*

Table 3-4
Potential Reptile and Amphibian Species On or Near the Project Site

Common Name	Scientific Name
Milksnake	*Lampropeltis triangulum*
Plain-Bellied Watersnake	*Nerodia erythrogaster*
Plains Threadsnake	*Leptotyphlops dulcis*
Prairie Kingsnake	*Lampropeltis calligaster*
Red-Bellied Mudsnake	*Farancia abacura*
Ribbonsnake	*Thamnophis proximus*
Rough Earthsnake	*Virginia striatula*
Rough Greensnake	*Opheodrys aestivus*
Schott’s Whipsnake	*Masticophis schotti*
Southern Watersnake	*Nerodia fasciata*
Texas Coral Snake	*Micrurus tener*
Western Diamond-Backed Rattlesnake	*Crotalus atrox*
Lesser Siren	*Siren intermedia*
Texas Black-Spotted Newt	*Notophthalamus meridionalis*
Couch's Spadefoot	*Scaphiopus couchii*
Great Plains Narrow-Mouthed Toad	*Gastrophryne olivacea*
Green Toad	*Bufo debilis*
Green Treefrog	*Hyla cinerea*
Gulf Coast Toad	*Bufo nebulifer*
Hurter's Spadefoot	*Scaphiopus hurterii*
Northern Cricket Frog	*Acris crepitans*
Rio Grande Chirping Frog	*Eleutherodactylus cystignathoides*
Rio Grande Leopard Frog	*Rana berlandieri*
Sheep Frog	*Hypopachus variolosus*
Southern Leopard Frog	*Rana sphenocephala*
Spotted Chorus Frog	*Pseudacris clarkii*
Squirrel Treefrog	*Hyla squirella*
Texas Toad	*Bufo speciosus*
Brown Anole	*Anolis sagrei*

Table 3-4
Potential Reptile and Amphibian Species On or Near the Project Site

Common Name	Scientific Name
Green Anole	*Anolis carolinensis*
Ground Skink	*Scincella lateralis*
Keeled Earless Lizard	*Holbrookia propinqua*
Mediterranean House Gecko	*Hemidactylus turcicus*
Prairie Lizard	*Sceloporus undulatus*
Rose-Bellied Lizard	*Sceloporus variabilis*
Six-Lined Racerunner	*Aspidoscelis sexlineata*
Slender Glass Lizard	*Ophisaurus attenuatus*
Spot-Tailed Earless Lizard	*Holbrookia lacerata*
Texas Horned Lizard	*Phyrnosoma cornutum*
Texas Spiny Lizard	*Sceloporus olivaceus*
Texas Spotted Whiptail	*Aspidoscelis gularis*

Although these species have the possibility of occurring near the Proposed Project area, dredge location or the dredge material placement area(s), the island land use is entirely industrial, therefore, the only reptiles and amphibians likely to be found within the Proposed Project boundaries are those adapted to utilizing areas affect by frequent human disturbance. Although there may be some avoidance of the construction area by transient wildlife as a result of increased noise and human activity, these impacts are not considered significant and will be temporary in nature.

3.2.6 Threatened and/or Endangered Species

A species list was obtained using the USFWS IPaC to determine if federally-listed species and other federal-trust resources may be on or near the Site. A response letter received from USFWS on July 8, 2019 indicated the presence of the following federally listed threatened and endangered species that may occur on the site, or that may be affected by the Proposed Project (**Table 3-5** below and **Appendix J**):

Table 3-5
Potential Federally Listed Threatened and Endangered Species On or Near the Project Site

Common Name	Scientific Name	Federal Status
Gulf Coast Jaguarundi	*Herpailurus yagouaroundi cacomitli*	Endangered

Table 3-5
Potential Federally Listed Threatened and Endangered Species On or Near the Project Site

Ocelot	*Leopardus pardalis*	Endangered
West Indian manatee	*Trichechus manatus*	Threatened
Least tern	*Sterna antillarum*	Endangered
Northern Aplomado Falcon	*Falco femoralis septentrionalis*	Endangered
Piping plover	*Charadrius melodus*	Threatened
Red knot	*Calidris canutus rufa*	Threatened
Whooping Crane	*Grus americana*	Endangered
Green sea turtle	*Chelonia mydas*	Threatened
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered
Kemp's Ridley sea turtle	*Lepidochelys kempii*	Endangered
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Loggerhead sea turtle	*Caretta*	Threatened
Slender Rush-pea	*Hoffmannseggia tenella*	Endangered
South Texas Ambrosia	*Ambrosia cheiranthifolia*	Endangered

The USFWS response letter indicated that there were no critical habitats documented within the Proposed Project area.

In Texas, animal or plant species of conservation concern may be listed as threatened or endangered under the authority of State law. The State has listed 32 species found in Nueces County as threatened or endangered. The TPWD website was consulted to determine if any of the species on or near the Proposed Project site are State-listed as threatened or endangered. **Table 3-6** below presents those sensitive species on or near the site that are protected within the State of Texas (TPWD 2019).

Table 3-6
Potential State Listed Threatened and Endangered Species On or Near the Project Site

Common Name	Scientific Name	State Status
Black-spotted newt	*Notophthalmus meridionalis*	Threatened
Sheep frog	*Hypopachus variolosus*	Threatened
Reddish Egret	*Egretta rufescens*	Threatened
White-faced Ibis	*Plegadis chihi*	Threatened
Wood Stork	*Mycteria americana*	Threatened
White-tailed Hawk	*Buteo albicaudatus*	Threatened

Table 3-6
Potential State Listed Threatened and Endangered Species On or Near the Project Site

Common Name	Scientific Name	State Status
Northern Aplomado Falcon	*Falco femoralis septentrionalis*	Endangered
Peregrine Falcon	*Falco peregrinus*	Threatened
American Peregrine Falcon	*Falco peregrinus anatum*	Threatened
Whooping Crane	*Grus americana*	Endangered
Piping Plover	*Charadrius melodus*	Threatened
Eskimo Curlew	*Numenius borealis*	Endangered
Sooty Tern	*Onychoprion fuscatus*	Threatened
Texas Botteri's Sparrow	*Peucaea botterii texana*	Threatened
Opossum pipefish	*Microphis brachyurus*	Threatened
Smalltooth sawfish	*Pristis pectinata*	Endangered
Southern yellow bat	*Dasypterus ega*	Threatened
Red wolf	*Canis rufus*	Endangered
White-nosed coati	*Nasua narica*	Threatened
Ocelot	*Leopardus pardalis*	Endangered
West Indian manatee	*Trichechus manatus*	Endangered
Loggerhead sea turtle	*Caretta caretta*	Threatened
Green sea turtle	*Chelonia mydas*	Threatened
Atlantic hawksbill sea turtle	*Eretmochelys imbricata*	Endangered
Kemp's Ridley sea turtle	*Lepidochelys kempii*	Endangered
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Texas tortoise	*Gopherus berlandieri*	Threatened
Texas horned lizard	*Phrynosoma cornutum*	Threatened
Texas scarlet snake	*Cemophora coccinea lineri*	Threatened
Texas indigo snake	*Drymarchon melanurus erebennus*	Threatened
South Texas ambrosia	*Ambrosia cheiranthifolia*	Endangered
Slender rushpea	*Hoffmannseggia tenella*	Endangered

In addition, there are 34 species that are on the rare species list for Nueces County. Rare species are those species native to Texas that are considered imperiled throughout a significant portion of the range but are not yet protected by State or Federal law. The TPWD actively tracks these rare species and promotes their conservation to prevent future endangerment. The brown pelican, the Texas diamondback terrapin (*Malaclemys terrapin littoralis*), the American eel (*Anguilla rostrata*), the Texas pipefish (*Syngnathus affinis*), Keeled earless lizard (*Holbrookia propinqua*), Plains gumweed (*Grindelia oolepis*), Cory's croton (*Croton coryi*), and Velvet spurge (*Euphorbia innocua*) are species that are potentially present on or near the site and are considered to be rare in the State of Texas (TPWS 2019b). There are a large number of threatened and endangered species within the vicinity of Harbor Island. There is the potential for species to be present; however, to date there has been no identification of threatened and endangered species on Harbor Island.

3.2.7 Cultural Resources

There are no historical properties, districts, or markers located on the Site. Site file research was completed using the online Texas Archaeological Site Atlas, maintained by the Texas Historical Commission (THC). The Site file research revealed that no previously recorded archaeological sites, identified historic properties, historic markers, or National Register properties are located within the current Proposed Project area. However, the results did reveal that there is one historical property and one historical district currently listed on the National Register of Historic Places (NRHP) within three miles of the Proposed Project (**Appendix K**). The historical property is located 0.6 miles southeast of the site, and is listed as the Tarpon Inn, a historical hotel dating to 1885. The historical district is located 0.91 miles northeast of the site and is listed as the Aransas Pass Light Station, dating back to the mid-1800s (THC 2019). There are seven historical markers located within one mile of the site (**Table 3-7**).

Table 3-7
Historical Markers Near the Project Site

Marker Name / Number	Marker Significance	Distance (miles) and Direction from Site
Aransas Pass Light Station / #184	The marker was placed to acknowledge the location of one of the original Texas stations of U.S. Lighthouse Service lighthouses which dates back to 1855 and had significance during the Civil War and the 1919 hurricane.	0.91 northeast
World War II Coastal Defenses at the Aransas Pass / #15267	The marker was placed to acknowledge locations along the gulf coast utilized as military defense sites in the 19th century and later. Officially designated as Temporary Harbor Defense at Aransas Pass, this coastal defense complex just south of the south jetty closed in July 1944, after enemy naval threats in the gulf were no longer a concern.	0.27 south
Aransas Pass, C.S.A / #185	Aransas Pass was a critical strategic site for the confederate army during the Civil War.	0.27 south

Table 3-7
Historical Markers Near the Project Site

Marker Name / Number	Marker Significance	Distance (miles) and Direction from Site
United States Coast Guard on Mustang Island / #15257	The first Aransas Life Saving Station on Mustang Island was erected in 1878. This structure came to house the U.S. Coast Guard which continues to safeguard lives and provide security.	0.27 south
Tarpon Inn / #5194	The Tarpon Inn was opened in 1886. It was rebuilt after the 1919 hurricane and has housed famous patrons along with serving as headquarters for the Red Cross, Salvation Army, and Military.	0.43 south
The Mercer Family on Mustang Island / #16851	The Mercer family arrived in 1855. Members of the family held notable Nueces County positions including, wreck master, bar pilots, and the first keeper of the Aransas Life Saving Station.	0.69 south
Mustang Island / #15857	Named for the wild horses which once populated the island, Port Aransas is located on Mustang Island, one of seven Texas barrier islands. The island was original home to the Karankawas and was first settled by Europeans in 1855. The settlement was abandoned during the Civil War. By 1920, tourism became the basis of the island's economy.	0.77 south

Based on the results of the archival research outlined, the property's industrial background and historical land disturbance, and geological characteristics associated with the Proposed Project area, there is low potential for undiscovered historic properties within the Proposed Project boundaries.

4.0 Permit Evaluation Policies

The public interest review is used to evaluate applications under all authorities administered by the USACE. This section discusses the following public review factors that the USACE considers during the review of a permit application.

4.1 Conservation

The Proposed Project will require the removal of approximately 6,500,000 CY of urban industrial land and submerged bottom sediment. Therefore, the Proposed Project will have unavoidable impacts to some upland and the bay bottom. However, the land proposed for removal is currently characterized by bare exposed soil, impervious surfaces, and/or disturbed upland areas dominated by short grasses or ruderal plant species. Upland vegetated areas that are not removed for the creation of the berths, but which are damaged during construction, will be seeded with stabilizing grasses and forbs, as necessary, and allowed to set seed for several years without mowing. The established seed bank and presence of ground stabilizing native grasses adjacent to the Proposed Project site will help mitigate the unavoidable impacts of construction to vegetation. Although the impacts to the WOTUS will be permanent, the bay bottom has been modified through maintenance-dredging operations. In addition, there are no known submerged aquatic vegetation areas in or near the Proposed Project area that would be impacted by Proposed Project activities. The Harbor Island area adjacent to the CSCC has been historically maintained as a terminal.

4.2 Economics

The Proposed Project is not expected to have an impact, adverse or beneficial, on race, gender, age class, or the area schools. However, the construction of the Proposed Project will support full and part-time construction-related jobs over the course of 13 months. During the construction period, jobs are anticipated to be filled by local area union construction workers from around the Aransas Pass, Port Aransas, and Corpus Christi metropolitan area. Due to the large available local labor pool, supplemental short-term labor needs are not likely to require an influx of temporary workers relocating to Nueces County during the Proposed Project's construction phase. PCCA anticipates that the addition of temporary construction workers during this phase will have a positive short-term effect on the local economy through their subsequent spending at nearby restaurants, hardware stores, and other local businesses. PCCA's long-term fiscal benefits to the area include that of PCCA's purchasing more products and services from local vendors for operations and maintenance of their expanded operations. Additionally, the facility will provide significant local, regional, and national economic benefits through development of facilities that allow export of domestic crude.

4.3 Aesthetics

The creation of the two marine berths will increase the flow of vessel traffic in and out of the Proposed Project area for the purpose of loading crude oil. Harbor Island historically operated as an oil terminal, the new infrastructure associated with the Proposed Project will allow vessels to be loaded more efficiently, thereby reducing the total number of vessel trips required to fully load each vessel. The increase in vessel traffic represents a small fraction of the overall marine vessel traffic within the surrounding area.

4.4 General Environmental Concerns

As it stands, the waterways surrounding the Proposed Project area may potentially be subject to degraded surface water quality from oil spills, leaks, and contamination from other nearby oil production and transport facilities (e.g., active wells, pipelines, petrochemical shipping), aerial deposits of airborne contaminants from area refineries, point source pollution from upstream facilities such as landfills, and non-point source pollution from storm water run-off from municipal and industrial developments (USACE 2018b). However, with the use of Best Management Practices (BMPs) (as mentioned in **Section 2.2.1)** and engineering controls, the impact to water quality from construction of the vessel berths will be minimal and considered to be within background regional conditions. The terminal itself will be a modern version of what existed previously, including, advance pollution control technology.

4.5 Wetlands

The Proposed Project will result in unavoidable disturbances to some estuarine, subtidal, unconsolidated bottom, subtidal (E1UBL) communities during construction. However, these disturbances are necessary to implement the Proposed Project. However, compensatory mitigation is not proposed as there will be no net loss of estuarine habitat as a result of dredging. In addition, this Proposed Project will effectively increase the amount of open water habitat available for use by aquatic species by removing upland soils and creating a wider channel floor. The construction activities will not significantly impact biological resources (i.e., plants, fish, and wildlife) due to the limited construction footprint and the planned protective measures (i.e. sediment and erosion control) that will be enacted during construction.

The effects on the open water communities surrounding the Site from construction of the new berths are considered to be within background levels of those created from the Federal dredging projects historically conducted within the waterways and approved to occur in the near future. In addition, the creation of a stabilized shoreline from construction of a sheet-pile bulkhead will reduce the risk of shoreline erosion and help protect the estuary from the effects of sedimentation.

It is anticipated that the Proposed Project will disturb two delineated wetlands along the north central portion of the terminal area boundary. The first wetland is described as a palustrine emergent wetland that is a small drainage depression adjacent to a parking area, approximately 0.0184 acres in size. The second wetland is described as a palustrine emergent wetland approximately 0.312 acres in size. No other wetlands are anticipated to be disturbed by the project.

4.6 Historic Properties

There are no documented historic or prehistoric archaeologically significant sites located within the Proposed Project area. Therefore, there will be no adverse effect on historic properties that are listed, or are eligible for listing, in the NRHP during construction. If an inadvertent discovery of previously unrecorded cultural resources occurs during the construction phase, work will be halted immediately, the THC will be contacted to determine the appropriate management actions to address such a situation.

4.7 Fish and Wildlife Values

The construction of the berths will not have adverse long-term environmental impacts to fish or shellfish species, or their habitat. In fact, the Proposed Project will increase the amount of available submerged aquatic benthic habitat. The use of stone and rock for stabilization along the dredge slope will become hard surface habitat, useful for a wide variety of invertebrates and fish. The artificial reefs created around each steel platform piling and along the dredge slope will allow for attachment of sessile invertebrates (e.g., oysters and mussels), increase feeding areas for mobile invertebrates (e.g., crabs and shrimp), and add structure and feeding areas for fish. The Proposed Project area is composed predominantly of a clay and silt bottom that provides habitat only for organisms adapted to life buried in the sediment and those organisms that feed on them. The addition of artificial habitat will attract and/or produce commercially and recreationally important fish and shellfish species.

In addition, the planned shoreline protection measures will act to reduce shoreline erosion. The reduction of erosion will protect fish eggs from being smothered during spawning. There will be no conversion of existing water bodies to that of a different salinity regime under the proposed alternative that could affect species assemblage within the estuary.

Although there may be some minor sediment disruption of fish and/or shellfish habitat during the initial dredging, these impacts are not considered significant and will be temporary in nature as any sediments that do not immediately settle back to the estuary floor are expected to be swept away in currents and/or tidal flow and diluted to undetectable levels. In addition, these disturbances are expected to be equivalent to background conditions as all of the local waterways surrounding the Proposed Project site are periodically dredged to aid in ship navigation.

4.8 Flood Hazards

The Proposed Project is not located in an area mapped by the Federal Emergency Management Agency (FEMA). Therefore, the flood zone category and base flood elevation data for the site are not available. Although flooding is a potential issue associated with the Proposed Project location, construction plans will take flood hazards into consideration.

4.9 Floodplain Values

The Proposed Project is not located in an area mapped by the FEMA. Therefore, the flood zone category and base flood elevation data for the site are not available. Although flooding is a potential issue associated with the Proposed Project location, construction plans will take floodplain values into consideration.

4.10 Land Use

Harbor Island is designated for urban industrial land use and is currently characterized by bare exposed soil, impervious surfaces, and/or disturbed upland areas dominated by short grasses or ruderal plant species. Due to the historical operations that occurred, the Site is deed recorded for property use limited to commercial industrial land use. The construction of the berths will require the removal of approximately 6,500,000 CY of material will be dredged and/or mechanically excavated. Impacts to land use are not considered to be adverse as the land proposed to be removed is flat industrial land with no sensitive terrestrial wildlife habitat. In addition, the construction of the two marine berths are consistent with the industrial nature of the surrounding properties.

4.11 Navigation

The construction phase of the Proposed Project would require construction personnel to travel along local roads leading to the site, such as SH-361 and Harbor Island Road. The use of local roads by the construction crew would be minor and temporary, and the resulting increase in traffic on local infrastructure, capable of handling over 4,000 cars per day, would not be significant. In addition, the use of a maximum of three construction barges or support vessels for the Proposed Project construction represents a small fraction of overall marine vessel traffic within the surrounding estuary. Therefore, the baseline marine traffic is not expected to change significantly as a result of Proposed Project activities and any effects will be temporary in nature.

4.12 Shore Erosion and Accretion

The shoreline protection measures along the length of each of the two berths will reduce the possibility of shoreline erosion from the wake of passing ships and strong tidal surges.

4.13 Recreation

Harbor Island is an industrial landscape, not used by visitors for wildlife-dependent activities in the Proposed Project area. Therefore, the Proposed Project would not result in adverse impacts on regional recreation activities. It is possible that minor impacts on sport fishing may occur during construction due to the anticipated temporary movement of fish outside the Proposed Project boundaries. However, these impacts will be minor and temporary.

4.14 Water Supply and Conservation

The Proposed Project does not affect public water supply.

4.15 Water Quality

The construction of the berths will result in localized movement of bottom sediments. The impacts on water quality in the area immediately surrounding the Site activities will be minimal and temporary, as subsequent deposition of the suspended sediment will allow the estuary to maintain the ecosystems they support.

The use of turbidity barriers and other BMPs to complete the various stages of work necessary for this Proposed Project will aid in effectively reducing the amount of soils or sediments suspended from construction activities. As such, the effects on water quality from the removal of soil and sediment within the Proposed Project boundaries are considered to be within the background conditions created from Federal deepening projects conducted within the waterways since 1912, and the proposed deepening project scheduled to occur in the near future.

4.16 Energy Needs

Energy needs will be satisfied by the creation of these two new berths, capable of handling larger deep-draft vessels, in response to the demands to export oil from the Permian and Eagle Ford Basins.

4.17 Safety

Safety will be mitigated by BMPs including, but not limited to, adherence to Federal regulations, ship crew education, and hazardous material spill engineering designs and procedures.

4.18 Food and Fiber Production

The Proposed Project does not affect food and fiber production.

4.19 Mineral Needs

The Proposed Project does not require the use of minerals and will have no effect on mineral needs.

4.20 Considerations of Property Ownership

The land portion of the Proposed Project is located on Harbor Island and is owned by PCCA. The water portion of the Proposed Project will be located within open waters regulated by the USACE. The CCSC is federally authorized to be dredged in the vicinity of this Proposed Project to a depth of -54 feet. A map showing adjacent property owners is included as **Figure 4a** and **4b** in **Appendix B** (corresponding to Box No 25. on the ENG4345).

4.21 The Needs and Welfare of the People

The purpose of the Proposed Project is to provide the necessary berthing facilities to support vessel engagement for the loading, unloading, transportation, and exporting of petroleum and other bulk products via waterborne commerce. Construction of the Proposed Project would provide the facilities necessary to integrate new and existing barge, pipeline, and storage infrastructure to maximize product handling efficiencies. The Proposed Project will restore inoperable shipping berths to productive use and add to the industrial tax base. By allowing better access for vessels, the resulting Proposed Project will help the United States better compete globally in the crude oil export market.

5.0 Avoidance and Minimization Measures

This Proposed Project is designed to meet the needs of the demand for safety and efficiency of the growing crude oil export industry. This Proposed Project is also located in a commercial vessel transit area that is routinely dredged.

Sediment suspension will be minimized by avoiding bottom stockpiling and over-filling of the dredge bucket, and not taking multiple bites with the dredge. A turbidity curtain, surface booms, oil-absorbent pads, and similar environmental containment materials and supplies will be kept on site to be immediately deployed as necessary. The work will also be performed during an approved in-water work window as specified by federal and state regulatory agencies (corresponding to Box No. 23 on the ENG4345).

6.0 References

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wood.

Appendix A

ENG FORM 4345
(Version dated May 2018)

U.S. Army Corps of Engineers (USACE) **APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT** 33 CFR 325. The proponent agency is CECW-CO-R.	*Form Approved - OMB No. 0710-0003 Expires: 01-08-2018*

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Sarah Middle - L Last - Garza	First - Middle - Last -
Company - Port of Corpus Christi Authority of Nueces County	Company -
E-mail Address - sarah@pocca.com	E-mail Address -
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 222 Power Street	Address-
City - Corpus Christi State - TX Zip - Country - USA	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 361-885-6163 c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, ______________________ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Harbor Island Dock Construction

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Corpus Christi Ship Channel	Address
15. LOCATION OF PROJECT	
Latitude: °N 27.845923 Longitude: °W -97.058392	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

Harbor Island is located to the northeast of Highway 361 and the ferry landing in Nueces County, Texas. The proposed marine berths are cated along the southern portion of Harbor Island along the Corpus Christi Ship Channel (CCSC) and the Navigational Channel within the ̮orpus Christi Bay, were the CCSC is 47 feet deep.

18. Nature of Activity (Description of project, include all features)

The Port of Corpus Christi Authority of Nueces County (PCCA) proposes the construction of two marine berths requiring dredging and excavation along the southern portion of Harbor Island, Corpus Christi, Texas adjacent to the Corpus Christi Ship Channel. The new berths will be dredged to a depth of 60 feet mean lower low water (MLLW) (-54 feet MLLW plus four feet of advance maintenance and two feet of allowable over dredge). Dredge material will be transfered to dredge placement area(s). The project area covers approximately 64.8 acres of terminal basin.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of the proposed project is to provide the necessary dock and berthing facilities to support vessel engagement with the loading, unloading, transportation, importing, and exporting of petroleum and other bulk products via waterborne commerce. Construction of the proposed project would provide the facilities necessary to integrate existing barge, pipeline, and storage infrastructure to maximize product handling efficiencies.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Dredge material generated from the construction of the Proposed Project will be placed in authorized dredge material placement area(s). See Figure 5.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See Section 5 in the combined Section 10 & Section 404 for further detail.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

[signature] 7/10/19

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Appendix B

Figures

PCCA Harbor Island Permit Application Site Location	★ Site Location	DATE MAY 2019
		SCALE 1 " = 5 miles
wood.		PROJECT NO. 6703180051
		FIGURE 1

DRAWN BY: SBROOKS CHECKED BY: SBHAKTA

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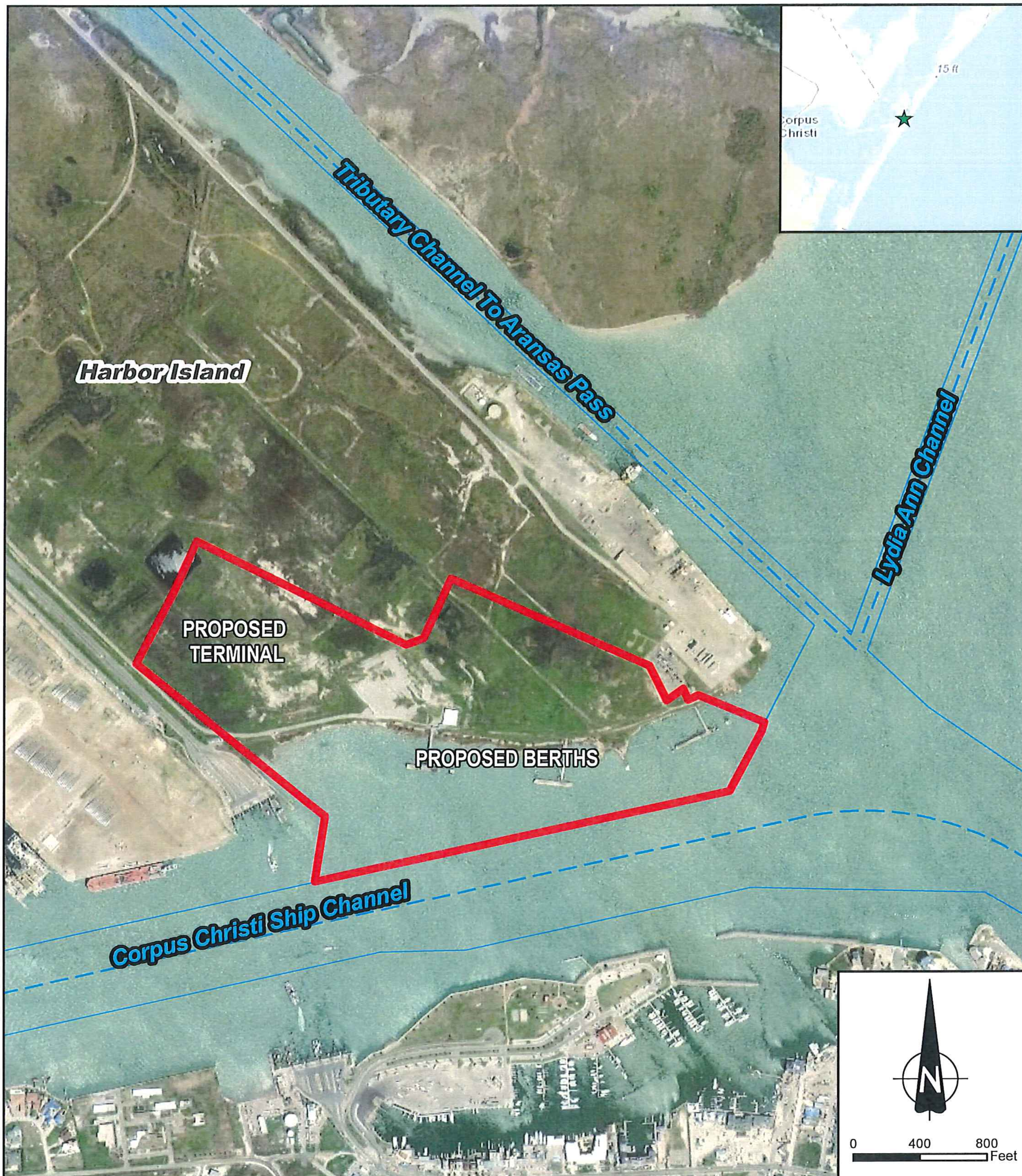

PCCA Harbor Island
Permit Application
Project Boundary

wood.

★	Site Location
– – –	Centerline of Channels
☐	Toe of Channel
☐	Project Boundary

DATE	JULY 2019
SCALE	1 " = 800'
PROJECT NO.	6703180051
FIGURE	2

DRAWN BY: SB CHECKED BY: CR

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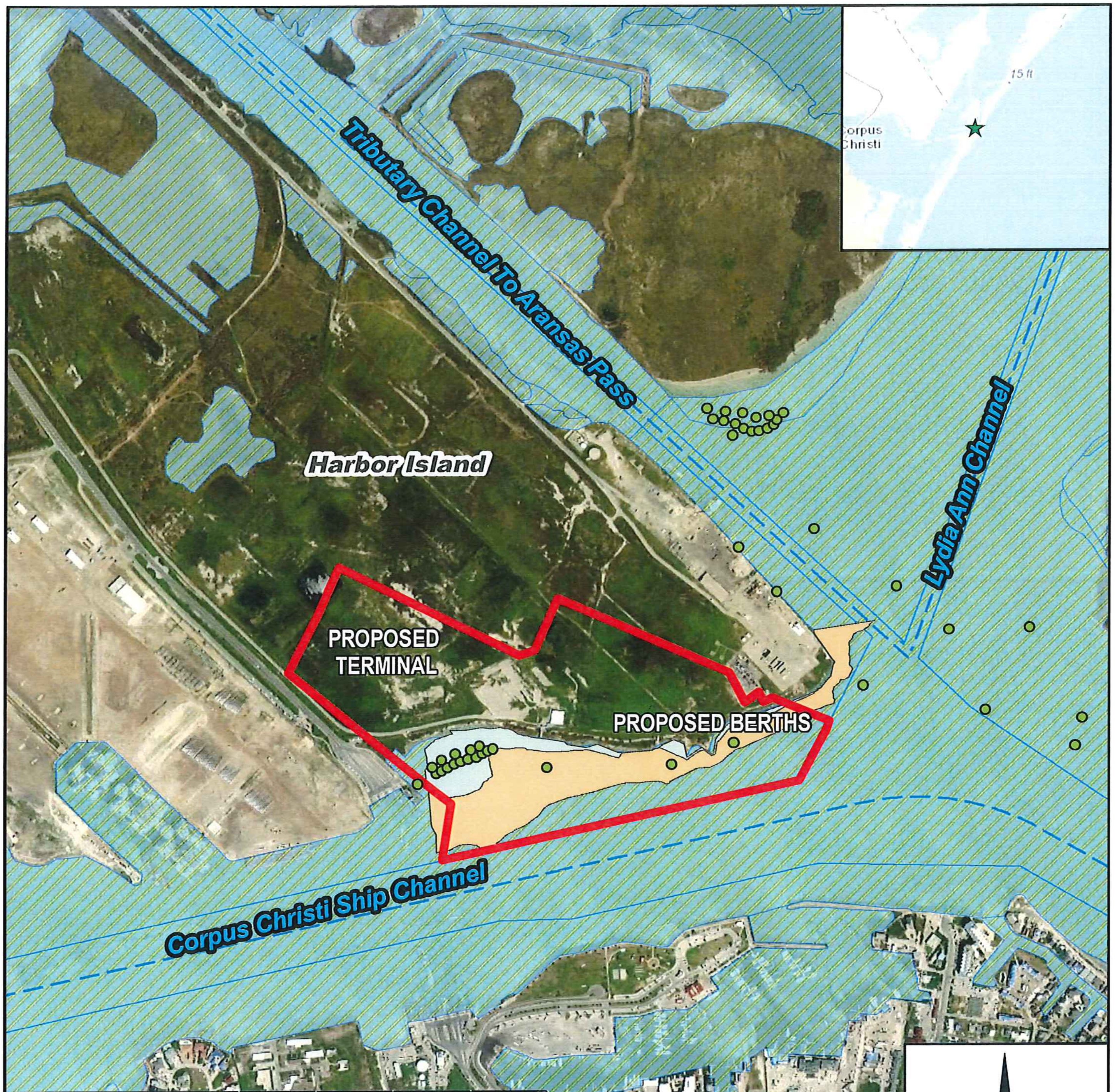

HABITAT IMPACT SUMMARY TABLE				
Resource Type	Existing (Ac.)	Impacted Excavation (Ac.)	Impacted Fill (Ac.)	Total Impacted (Ac.)
OYSTERS	0.00	0.00	0.00	0.00
SEAGRASS	0.00	0.00	0.00	0.00
ESTUARINE WETLAND	38.75	0.00	0.00	0.00
SHALLOW OPEN WATER (0.0 ft to -6.0 ft)	6.73			
DEEP OPEN WATER (-6.0 ft to -47.0 ft)	19.31			
UPLANDS	51.00			

DRAWN BY: SBROOKS CHECKED BY: SBHAKTA

PCCA Harbor Island
Permit Application
Impacts

wood.

Site Location
Sea Grass/Oyster Habitat Sample Location
Centerline of Channels
Toe of Channel
Project Boundary
Estuarine and Marine Deepwater (E1UBLx) Wetland Habitat
Deep Open Water (-6.0 ft to -47.0 ft)
Shallow Open Water (0.0 ft to -6.0 ft)

DATE
JULY 2019
SCALE
1 " = 1,000 feet
PROJECT NO.
6703180051
FIGURE
3

Z:\01_Projects\EIS_Projects\POCC\03_Exhibits\13_SECTION 10 - POCCA FIGURES\03_HARBOR_ISLAND_IMPACTS\2019_07_05\Figure 3 - Impacts.mxd - stacy.brooks - 7/9/2019 - 3:50:58 PM

PCCA Harbor Island
Permit Application
Adjacent Property Owners

wood.

Project Boundary
No Listed Owner
Owned by: Port of Corpus Christi of Nueces County (Applicant)
Adjacent Landowners Parcels
Site Location
See Attachment I for list of property owners

DATE
JULY 2019
SCALE
1 " = 1,700 feet
PROJECT NO.
6703180051
FIGURE
4a

DRAWN BY: SBROOKS CHECKED BY: SBHAKTA

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PCCA Harbor Island
Permit Application
Adjacent Property Owners

wood.

Project Boundary

Adjacent Landowner Parcels

See Attachment I for list of property owners

DATE	JULY 2019
SCALE	1 " = 850 feet
PROJECT NO.	6703180051
FIGURE	4b

DRAWN BY: SBROOKS CHECKED BY: SBHAKTA

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Port of Corpus Christi Authority of Nueces County

wood.

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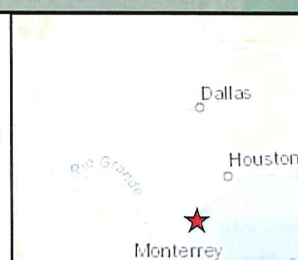
Legend

Dredged Material Placement Areas

★ Site Location

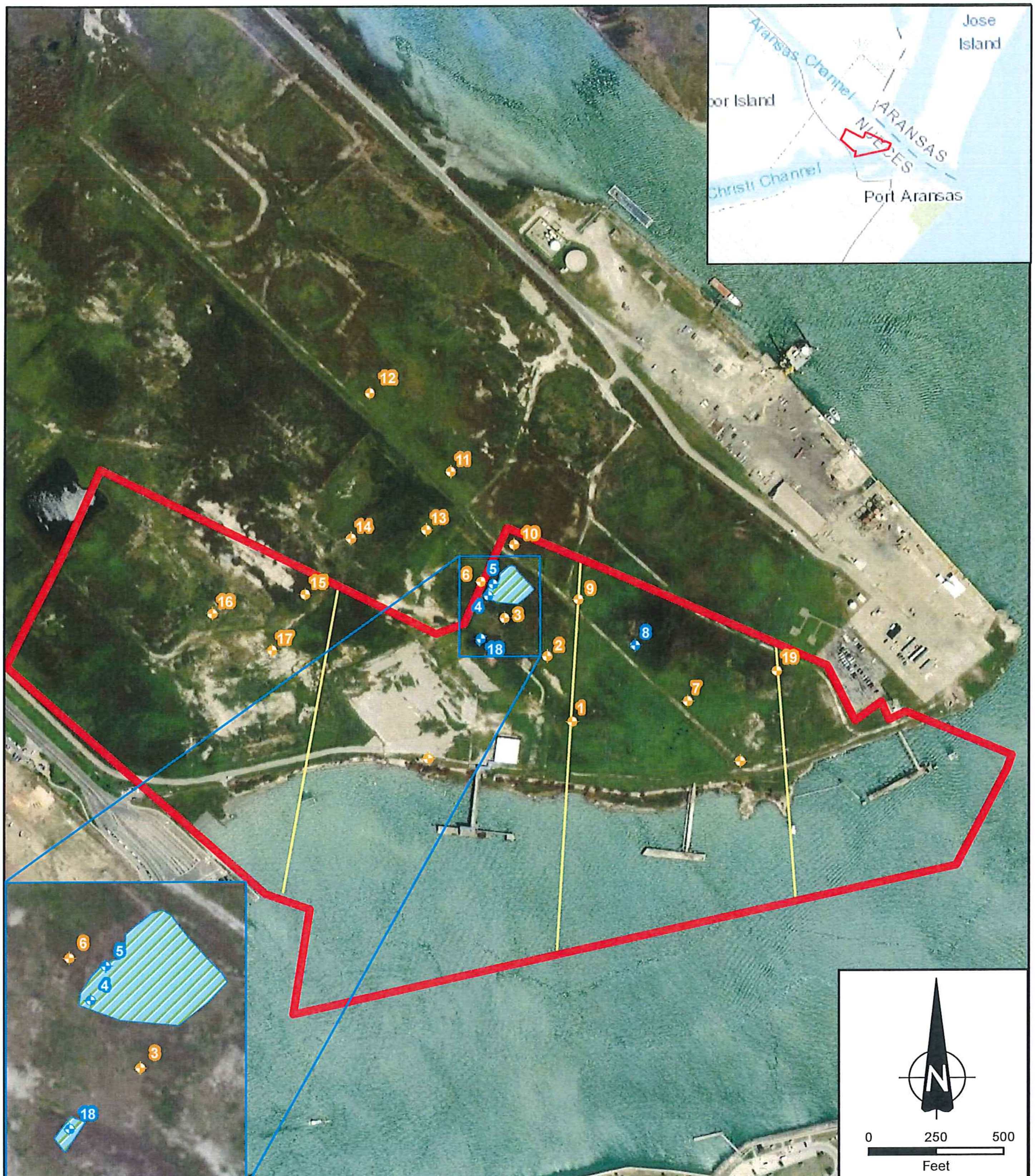


Project Turnpike

Dredge Material Placement Areas

DATE	MARCH 2019
SCALE	1 " = 7,700 '
PROJECT NO.	6703180051
FIGURE	5

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\13_SECTION 10 - POCCA FIGURES\05_DREDGING_MATERIAL_PLACEMENT\2019_03_26\Figure 5 - Dredged Material Placement Areas.mxd - stacy.brooks - 3/27/2019 - 10:47:23 AM



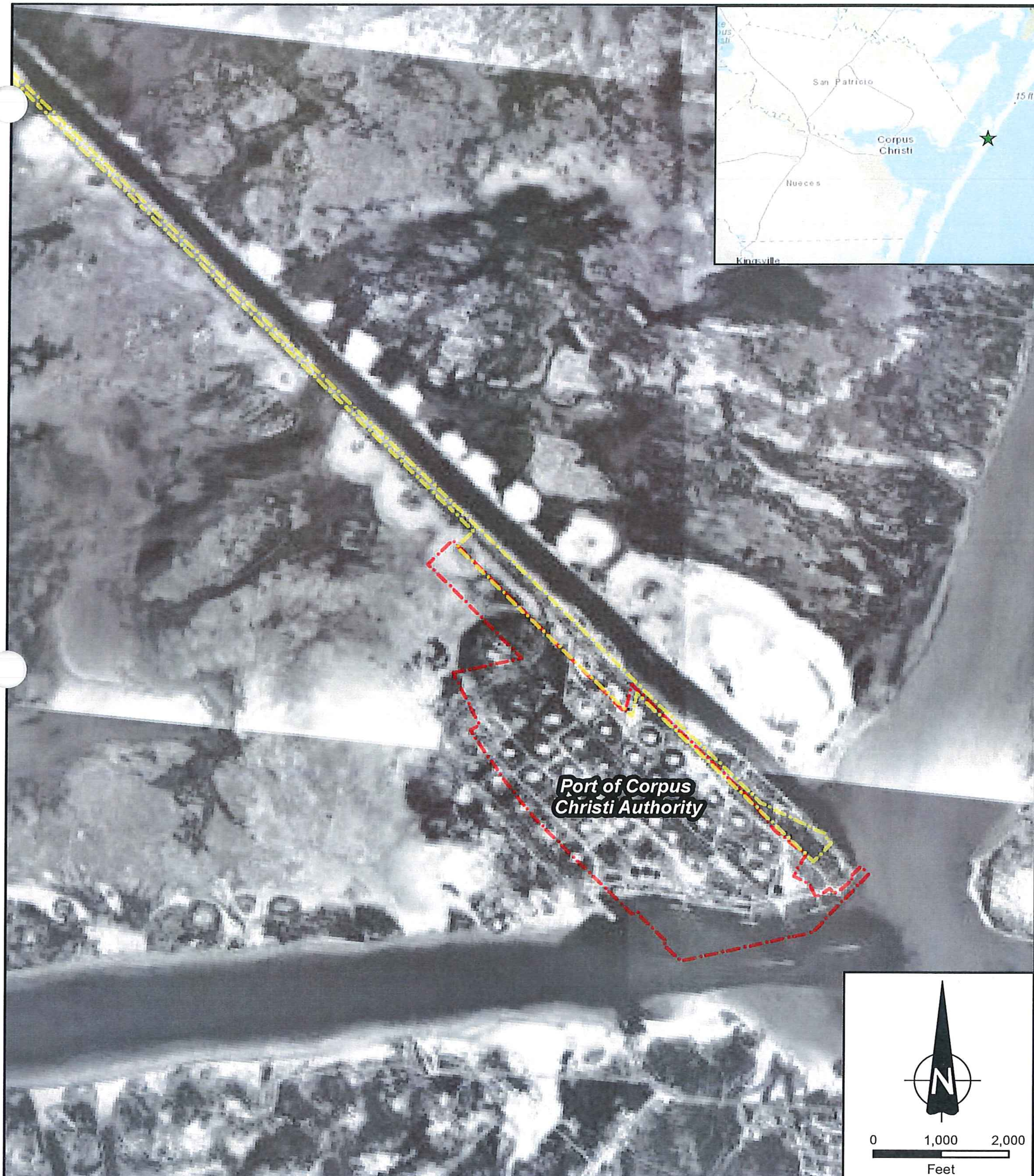
Port Of Corpus Christi Authority of Nueces County	Upland Point Wetland Point Project Boundary Transects Wetlands	**Wetland Boundary Map**	DATE JULY 2019 SCALE 1 " = 500 '
wood.		Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI,	PROJECT NO. 6703180030 FIGURE 6

DRAWN BY: SD CHECKED BY: JHK

Z:\01_Projects\EIS_Projects\POCC\03_Exhibits\06_WETLAND\2019_07_09\Fig_6_Wetland_Boundary_Map.mxd - stacy.brooks - 7/9/2019 - 4:12:48 PM

Appendix C

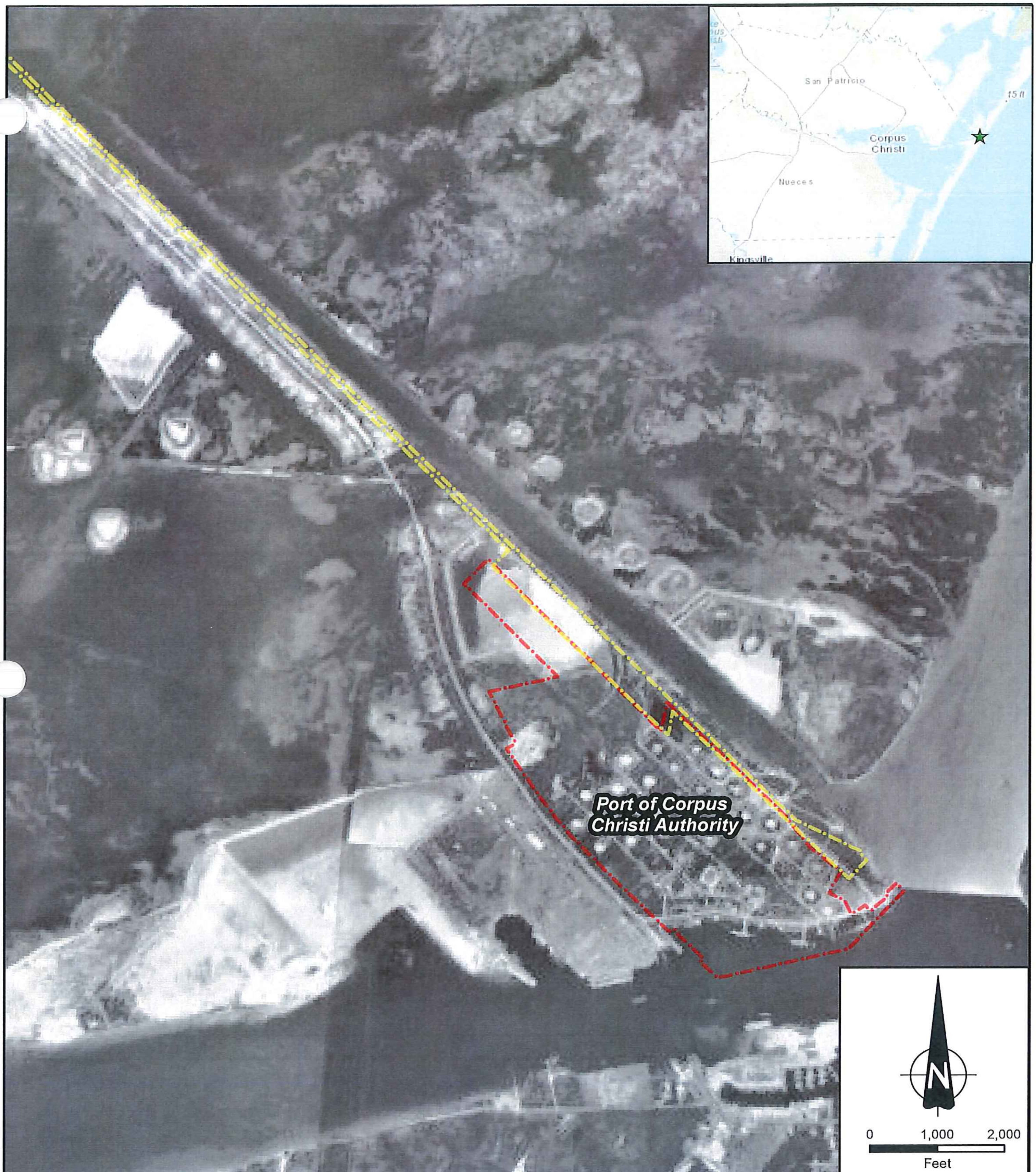
Historic Aerial Photographs



ort Of Corpus Christi Authority of Nueces County	Right-Of-Way Property Boundary ★ Site Location	Historical Imagery 1955	DATE JUNE 2019 SCALE 1 " = 2,000 '
wood.		Service Layer Credits: Image NASA, Image Texas General Land Office, Google Earth Pro, Imagery Date: 12/31/1955, Date: 06/13/2019	PROJECT NO. 6703180051 FIGURE 1

DRAWN BY: SD CHECKED BY: JP

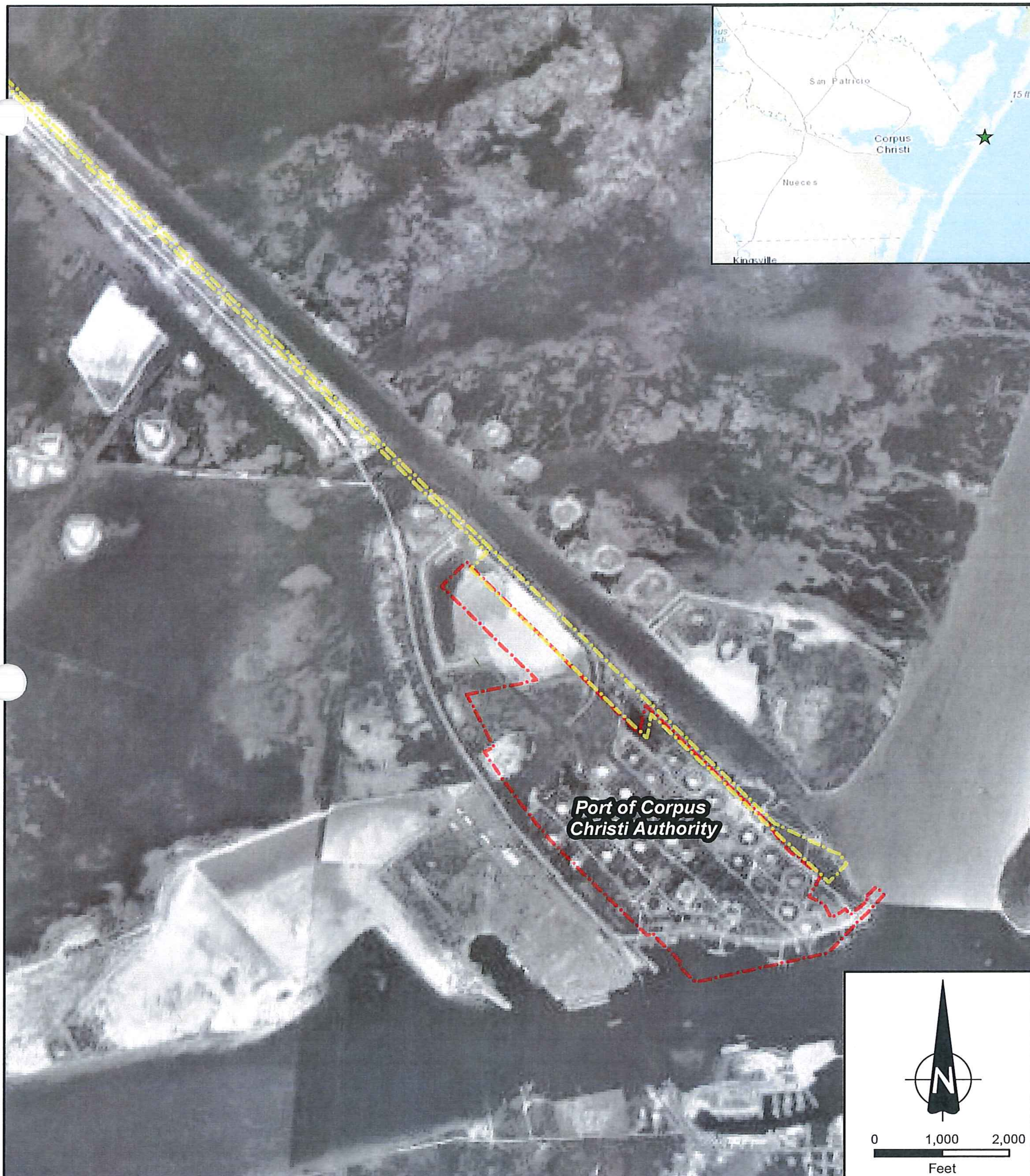
\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\03_HISTORICAL_MAP\20190617\Figure_1_Historical_Imagery_1955.mxd - stacy.brooks - 6/17/2019 - 11:37:07 AM



Port Of Corpus Christi Authority of Nueces County	Right-Of-Way Property Boundary Site Location	Historical Imagery 1978	DATE JUNE 2019
			SCALE 1 " = 2,000 '
wood.		Service Layer Credits: Image NASA, Image Texas General Land Office, Google Earth Pro, Imagery Date: 12/31/1978, Date: 06/13/2019	PROJECT NO. 6703180051
			FIGURE 2

DRAWN BY: SD CHECKED BY

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\03_HISTORICAL_MAP\20190617\Figure_2_Historical_Imagery_1978.mxd - stacy.brooks - 6/17/2019 - 10:10:28 AM



Port Of Corpus Christi Authority of Nueces County

wood.

DRAWN BY: SD CHECKED BY:

Legend
Right-Of-Way
Property Boundary
Site Location

Historical Imagery 1984

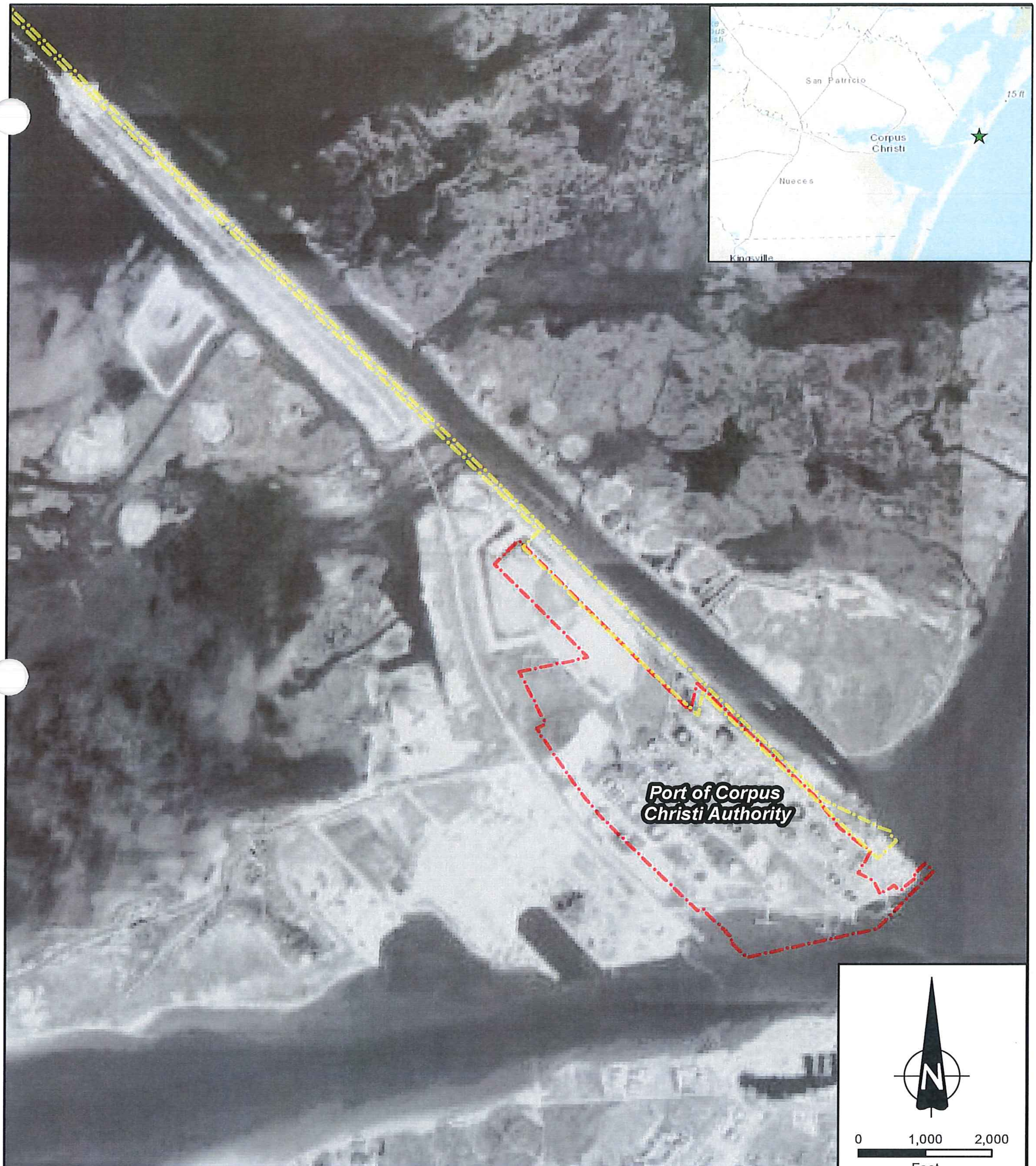
Service Layer Credits: Image NASA, Image Texas General Land Office, Google Earth Pro, Imagery Date: 12/31/1984, Date: 06/13/2019

DATE	JUNE 2019
SCALE	1 " = 2,000 '
PROJECT NO.	6703180051
FIGURE	3

Port Of Corpus Christi Authority of Nueces County	Property Boundary ★ Site Location	Historical Imagery 1995	DATE JUNE 2019
			SCALE 1 " = 2,000 '
wood.		Service Layer Credits: Image NASA, Image Texas General Land Office, Google Earth Pro, Imagery Date: 01/06/1995, Date: 06/13/2019	PROJECT NO. 6703180051
			FIGURE 4

DRAWN BY: SD CHECKED BY:

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\03_HISTORICAL_MAP\20190617\Figure_4_Historical_Imagery_1995.mxd - stacy.brooks - 6/17/2019 - 10:06:43 AM



Port Of Corpus Christi Authority of Nueces County

Right-Of-Way
Property Boundary
Site Location

Historical Imagery 2002

DATE
JUNE 2019

SCALE
1 " = 2,000 '

PROJECT NO.
6703180051

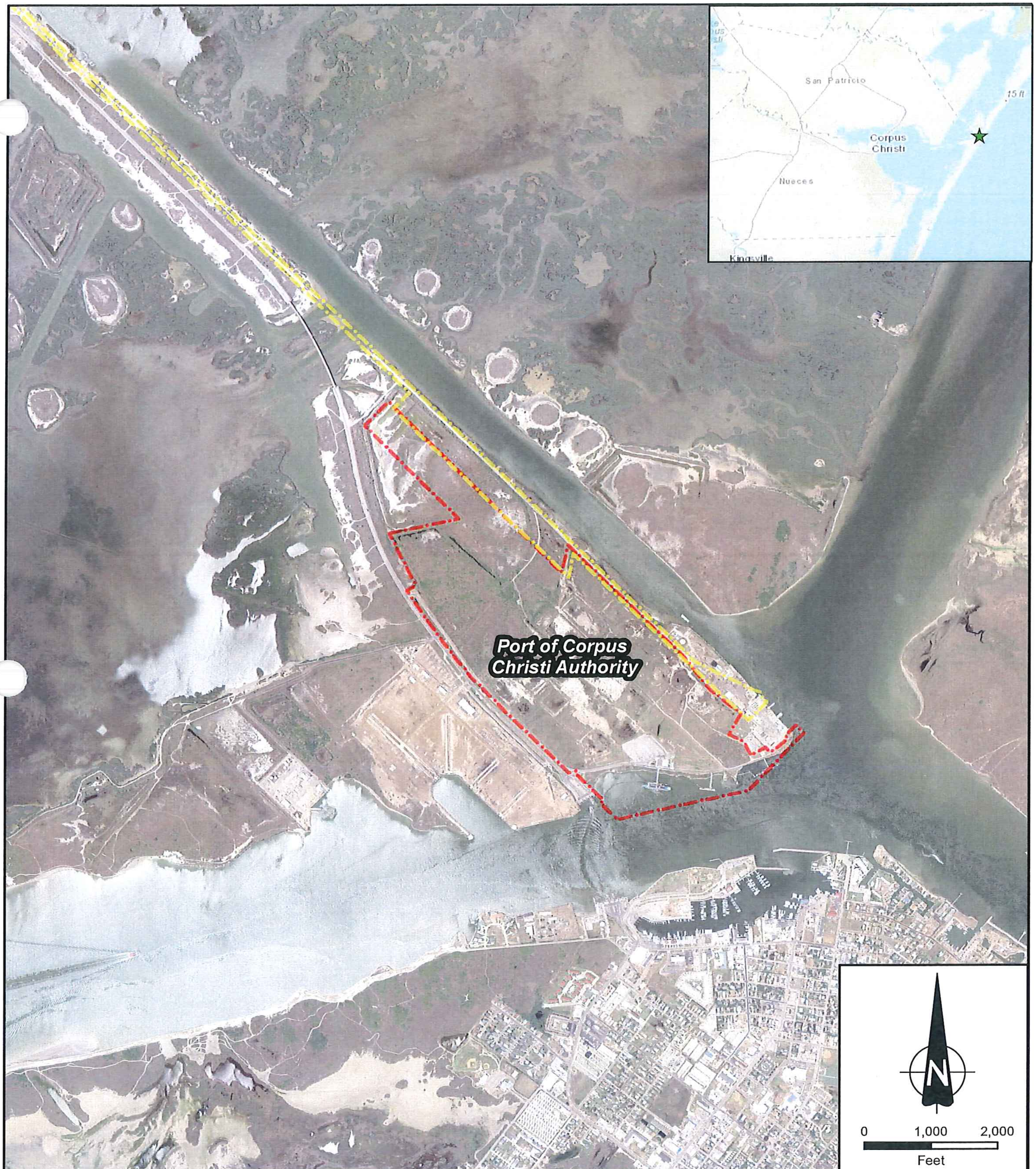
FIGURE
5

wood.

Service Layer Credits: Image Landset / Copernicus, Image Texas General Land Office, Image U.S. Geological Survey, Image NASA, Google Earth Pro, Imagery Date: 12/30/2002, Date: 06/17/2019

DRAWN BY: SD CHECKED BY:

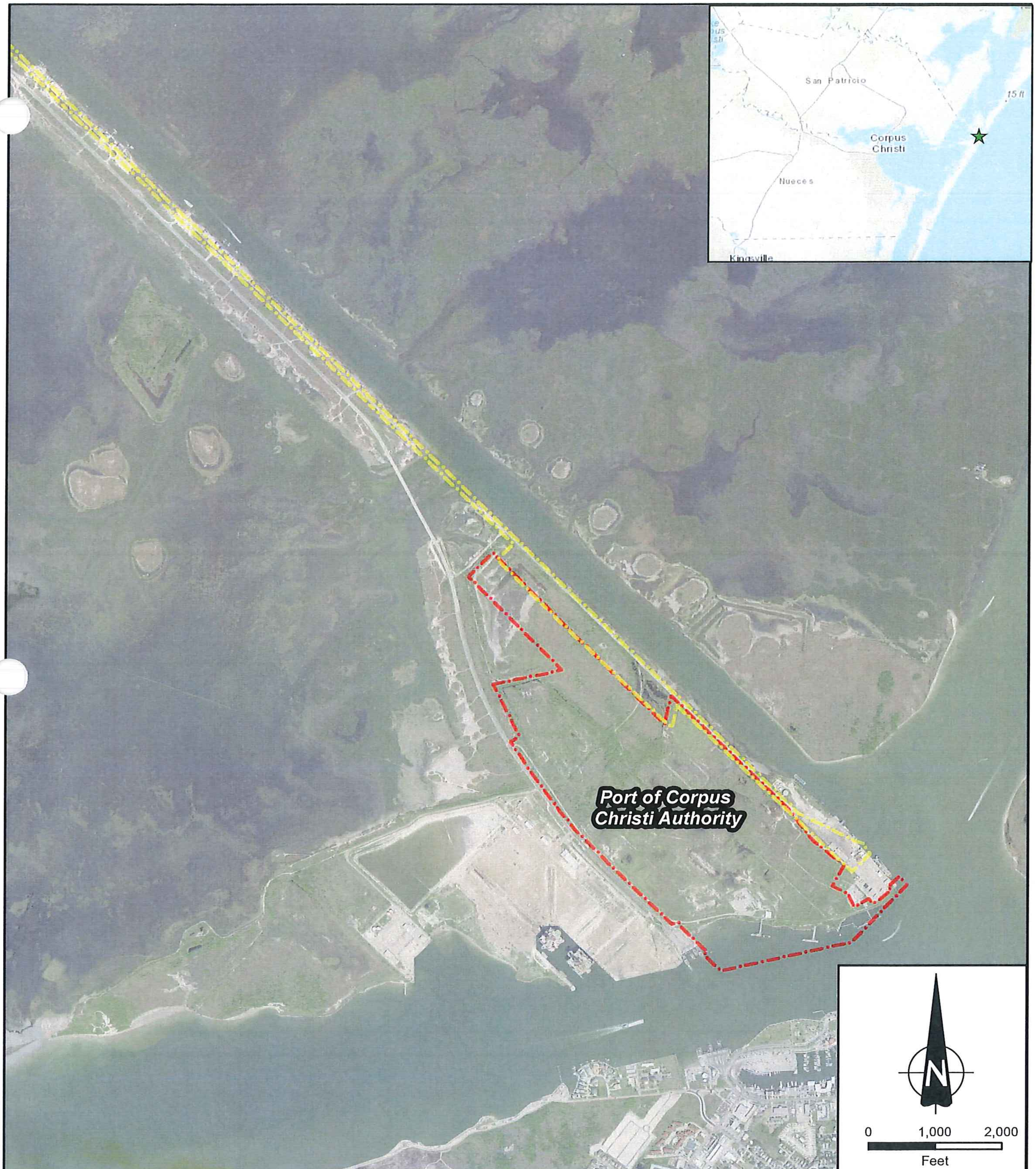
\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\03_HISTORICAL_MAP\20190617\Figure_5_Historical_Imagery_2002.mxd - stacy.brooks - 6/17/2019 - 3:22:35 PM



Port Of Corpus Christi Authority of Nueces County	Right-Of-Way Property Boundary Site Location	Historical Imagery 2008	DATE JUNE 2019
			SCALE 1 " = 2,000 '
wood.		Service Layer Credits: TNRIS, Nueces Color/Color Infrared (4 Band) Date: 06/13/2019	PROJECT NO. 6703180051
			FIGURE 6

DRAWN BY: SD CHECKED BY:

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\03_HISTORICAL_MAP\20190617\Figure_6_Historical_Imagery_2008.mxd - stacy.brooks - 6/17/2019 - 11:22:49 AM



Port Of Corpus Christi Authority of Nueces County	Right-Of-Way Property Boundary Site Location	Historical Imagery 2016	DATE JUNE 2019 SCALE 1 " = 2,000 '
wood.		Service Layer Credits: TNRIS, Date: 06/13/2019	PROJECT NO. 6703180051 FIGURE 7

DRAWN BY: SD CHECKED BY

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\03_HISTORICAL_MAP\20190617\Figure_7_Historical_Imagery_2016.mxd - stacy.brooks - 6/17/2019 - 11:29:07 AM

Appendix D

Port Aransas Code of Ordinances

Sec. 25-121. - HI Harbor Island district regulations.

In this district no land or building shall be used, erected for, or converted to any use other than:

(1) Any lawful, non-dwelling, non-residential use listed in R-1, R-2, TR-1, TR-2, TR-3, C-1, C-2, or I-1;

(2) Light manufacturing;

(3) Marine terminals;

(4) Storage Facilities for oil and/or gas;

(5) Ship yards;

(6) Fabrication yards;

(7) Offshore oil/gas support services;

(8) Cruise ship/Gaming ship terminal;

(9) Research and testing laboratories;

(10) Communication towers;

(11) Concrete and asphalt batch plants;

(12) Seafood processing, packing, and storage;

(13) Dwellings for resident watchmen/caretakers;

(14) Dredge material placement areas.

Planned unit developments are encouraged.

(Ord. No. 97-8, § 1, 7-17-97; Ord. No. 2010-05, § 1, 3-18-10; Ord. No. 2014-06, § 1.b, 2-20-14)

ORDINANCE NO. 2014-06

AN ORDINANCE (1) AMENDING SECTION 25-121 PORT ARANSAS CODE OF ORDINANCES ("PACO") AND THEREBY RE-ZONING THAT PORTION OF THE LAND AREA KNOWN AS HARBOR ISLAND WHICH IS INCLUDED WITHIN THE HI HARBOR ISLAND ZONING DISTRICT UNDER SECTION 25-121 PACO, MORE PARTICULARLY BY DELETING THE LIST OF ALLOWED USES SET FORTH IN 25-121 AND REPLACING THAT LIST WITH A MORE RESTRICTIVE LIST OF ALLOWED HEAVY INDUSTRY USES, ALL OF WHICH LAND IS WITHIN PORT ARANSAS' CITY LIMITS AND IS GENERALLY LOCATED NORTH OF CORPUS CHRISTI SHIP CHANNEL, TO THE WEST OF THE EXTREME NORTHEAST TIP OF MUSTANG ISLAND, AND IS SEPARATED FROM THE REMAINDER OF THE CITY, WHICH LIES ON MUSTANG ISLAND, BY THE CORPUS CHRISTI SHIP CHANNEL, AND (2) PROVIDING FOR A DECLARATION OF CITY BOUNDARY, (3) FOR CORRECTION OF THE OFFICIAL ZONING MAP, AND (4) FOR READING, EFFECTIVE DATE, AND SEVERANCE.

FINDINGS

The City Council of the City of Port Aransas, Texas (Council) makes the legislative findings hereinafter set forth at Parts A through and including D, all of which are hereby found to be true and correct legislative and factual findings of the Council, and they are hereby approved and incorporated into the body of this Ordinance as part of this Ordinance.

Part A. Harbor Island – Historical Use Overview

Harbor Island lies to the West of the extreme Northeast tip of Mustang Island, includes land on both sides of Aransas Channel, and is separated from the remainder of the city (which lies on Mustang Island) by the 1,500' wide Corpus Christi Ship Channel. The ship channel provides shipping access from the Gulf of Mexico to various inland ports including the cities of Port Aransas, Aransas Pass, Ingleside, Portland, and Corpus Christi.

Historical use of Harbor Island dates back to the late 1800's, however, industrial uses did not take hold until 1912, following the completion of a permanent federal built jetty system that opened the doors for reliable shipping access and a rail system connecting mainland Aransas Pass. Cotton export was the first commercial activity seen (1912) followed immediately by crude oil storage and transport (1912), then a shipyard in 1918. With the opening of the Corpus Christi Ship Channel in 1927, Harbor Island activity slowed due to competition with a larger port town with better amenities. Cotton uses left in 1926 leaving the island's primary use through the 30's, 40's, 50's and 60's to oil storage and transport, and a public ferry system that provide transportation to the City of Port Aransas.

New developments in offshore drilling changed everything in the 70's. The need for offshore rig fabrication yards with deep water access and close proximity to the Gulf of Mexico meant another busy cycle for Harbor Island. This was immediately followed by offshore rig support businesses setting up operations to run crews and drilling supplies back and forth from the rigs. Though large rig fabrication slowed in the early 2000's, offshore crew and drilling support still continues today. The early 1990's also saw the end of crude oil storage on Harbor Island and the tank farms once owned by Fina and Exxon were slowly dismantled over the next few years.

Other recent uses include: the Texas Treasure casino ship in operation from 2000-2008, offshore support companies Haliburton, and Martin Midstream, fabricators Brown & Root, J. Ray McDermott, and most recently, LNG transporter Martin Midstream.

Ownership of Harbor Island properties has changed throughout the years. The largest ownership change in the last twenty years came in 1995 when the Port of Corpus Christi (POCC) purchased the Fina/Exxon tracts.

Part B. Harbor Island - Historical Incorporation and Annexation Overview

The City incorporated in 1911, including within its original boundaries the tip of Harbor Island which is generally defined by and lies at the junction of Corpus Christi Ship Channel and Aransas Channel and is directly across the Corpus Christi Ship Channel from what is present day Robert's Point Park. The City in 1970 by Ordinance 70-2, in 1973 by Ordinance 73-1, and in 1980 by Ordinance 80-6 annexed additional Harbor Island land.

Part C. Harbor Island - Historical Zoning Overview

The portion of Harbor Island which is within the city limits of Port Aransas and is within the HI Harbor Island zoning district was originally defined by the City's official zoning map in 1985-1986. While the district name and uses allowed in the district have changed over time, the boundaries of the district have never been changed. The land in the district is governed for zoning purposes by Section 25-121 Port Aransas Code of Ordinances. It lies north of Corpus Christi Ship Channel, and is more specifically described, to the extent the following include Harbor Island land located north of Corpus Christi Ship Channel, by the Order of the County Judge of Nueces County, Texas dated February 20, 1912 establishing the City's original incorporation boundaries to which reference is made in minutes of the City Council dated January 26, 1952, and by City Ordinances numbered 70-2, 73-1 and 80-6. It is this land which is in the HI Harbor Island Zoning District, is governed as to zoning by Section 25-121 Port Aransas Code of Ordinances, and is directly affected and effectively re-zoned by this Ordinance.

There have been three primary zoning actions affecting those portions of Harbor Island within Port Aransas' jurisdiction and which are the subject of this Ordinance. The first was Ordinance 85-22 in 1985, followed by Ordinance 97-8 in 1997, and Ordinance 10-05 in 2010 as follows:

> 1985 Ordinance 85-22. What is now the HI Harbor Island zoning district was then called "Industrial District" and the ordinance provided that property could be used in such district only for the following purposes:

(23) *Storage of petroleum and petroleum products, crewboat docking facilities and petroleum related uses;*
(24) *Fabrication and manufacturing of oil rig jackets and structures.*
(25) *Dwellings for resident watchmen – caretakers.*

<u>1997 Ordinance 97-8.</u> The district name was changed to "I-2 Heavy Industrial" and the ordinance provided that land in the district could only be used for:

(1) *Any lawful, non-dwelling, non-residential use or*
(2) *Dwellings for resident watchmen/caretakers.*

<u>2010 Ordinance 10-05.</u> The district was renamed "HI Harbor Island." Allowed uses were defined and are now codified under Sec. 25-121 PACO as follows:

"Sec. 25-121. Harbor Island District – In this district no land or building shall be used, erected for, or converted to any use other than:

(1) *Heavy industrial uses;*
(2) *Any lawful, non-dwelling, non-residential use;*
(3) *Planned unit developments (PUD) and master planned developments are encouraged;*
(4) *Dwellings for resident watchmen/caretakers provided they are clearly incidental and secondary with the main use to which the property is put.*"

25-121 PACO establishes the HI Harbor Island zoning district. I understand Port Aransas adopted zoning in 1985 and the official zoning map created in 1986 defining the land which was included in each district includes in the district now known as "HI Harbor Island" zoning district but then called "Industrial" all of the Harbor Island land incorporated within the City's original 1911-1912 incorporated territory and all Harbor Island land annexed by Ordinances 70-2, 73-1, and 80-6. I understand no other land in Port Aransas is in the district, that from 1985 to the present no changes have been made by extracting land from it or adding land to it. I understand that, even though the zoning district boundaries have not changed since 1985-86, the 1997 revised official zoning map mistakenly left out the Harbor Island land which lies northeast of Aransas Channel (i.e. some of the Harbor Island land annexed by Ordinance 80-6 and all of the Harbor Island land annexed by Ordinance 73-1), and the 2010 revised official zoning map simply copied the 1997 map boundary. The official zoning map must be corrected to correctly reflect the land which is in fact in the HI Harbor Island zoning district.

<u>Part D. Present Day Conditions and Determination</u>

The Port of Corpus Christi owns substantial acreage on Harbor Island some or all of which acreage was recently slated to have been sold to Martin Midstream which proposed to develop multiple fractionator and splitter plants, and storage facilities on the land. The sale did not occur, but the planned use spurred serious concern of the citizens of Port Aransas and this Council about future development on Harbor Island.

A public need exists to re-zone Harbor Island in order to promote and avoid damage to the life, health, property, safety and public peace of the City and its citizens. The City of Port Aransas developed as a fishing village. It is a non-industrial town and relatively clean and free of the pollutants which normally accompany some industrial developments. Its commercial structures historically were small and primarily wooden with peaked roofs. The City in its commercial area had and still has the flavor and ambiance of a small fishing village which imbues it with a distinctive charm and character. The City has in the past few years, experienced extremely rapid growth and is in danger of losing the charm which makes it an attractive, unique venue. In recognition of this situation the City Council has determined that re-zoning Harbor Island and the imposition of additional controls upon new heavy industry development on Harbor Island is in the public interest. In order to prevent the development of Harbor Island in a way which would adversely affect, damage or destroy the aesthetics or environment of the City the Council considers it necessary to re-zone Harbor Island. The Planning and Zoning Commission and City Council have reviewed and analyzed Harbor Island development, historical, current and future, to determine if the zoning classifications, including design, construction and development standards, are consistent with the City's Comprehensive Plan, and whether such classifications and standards currently are in the best interests of the community and the general welfare of the City. The City Council has determined that it is in the best interest of the public to re-zone the property.

The records of the city show that the Harbor Island area has been a part of the city continuously for several decades as more specifically set out in the Incorporation and Annexation History under Part B above. The city has provided municipal services, including police protection, to the area and has otherwise treated the area as a part of the city continuously with respect to each part of Harbor Island from the time each part was taken into the city limits to the present. There has not been a final judicial determination during any of this time that the area of Harbor Island now inside the boundaries of the City according to the records of the City and as found in this Ordinance to be within the City's boundaries is outside the boundaries of the city. In fact, the final Decree of the 94th District Court of Nueces County, Texas in cause numbered 76-12-C expressly decreed the validity of the City's annexation ordinances and boundaries as of the date of the decree March 30, 1977. There is no pending lawsuit that challenges the inclusion of the Harbor Island area as part of the city.

The Planning & Zoning Commission met December 19, 2013 and considered the matter of the development and re-zoning of Harbor Island, adopted a preliminary report, and set a public hearing. The Planning & Zoning Commission conducted a public hearing on January 16, 2014 and adopted a final report, which includes a recommendation to the Council that Harbor Island be re-zoned. The Council on January 16, 2014 received the Planning & Zoning Commission final report and thereafter conducted a public hearing. Notices of the public hearings and meetings were published, posted and given to those entitled, in the time, and in the proper form, all as required by law.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORT ARANSAS, COUNTY OF NUECES, STATE OF TEXAS:

SECTION 1. AMENDMENT AND DECLARATION.

Sub-Section 1.a.

It is hereby declared that all land area shown to be within Port Aransas city limits original incorporation boundaries and all land area annexed by Ordinances 70-2, 73-1 and 80-6, is adjacent to the remainder of the City and is part of the City for all purposes.

Sub-Section 1.b.

Section 25-121 Port Aransas Code of Ordinances is hereby amended, new matter being indicated by underlining and deleted matter by interlining:

Section 25-121. – HI Harbor Island district regulations.

In this district no land or building shall be used, erected for, or converted to any use other than:

1. Any lawful, non-dwelling, non-residential use listed in R-1, R-2, TR-1, TR-2, TR-3, C-1, C-2, or I-1;
2. Light manufacturing;
3. Marine terminals;
4. Storage Facilities for oil and/or gas;
5. Ship yards;
6. Fabrication yards;
7. Offshore oil/gas support services;
8. Cruise ship/Gaming ship terminal;
9. Research and testing laboratories;
10. Communication towers;
11. Concrete and asphalt batch plants;
12. Seafood processing, packing, and storage;
13. Dwellings for resident watchmen/caretakers;
14. Dredge material placement areas.

Planned Unit Developments are encouraged.

Sub-Section 1.c.

The City's Official Zoning Map shall be corrected to reflect the inclusion of all Harbor Island land which is in Port Aransas city limits in the HI Harbor Island zoning district governed by 25-121 PACO as found above.

SECTION 2. EFFECTIVE DATE. As provided by Article III, Section 12.C. and by Article XII, Section 2 of the Charter of the City of Port Aransas, this Ordinance shall be effective upon adoption and, in addition, if any penalty, fine or forfeiture is imposed by this Ordinance, then this Ordinance shall be effective only after publication of this Ordinance in its entirety or in summary form once in the official newspaper of the City of Port Aransas.

SECTION 3. READING. As provided by Article III, Section 13 and Article III, Section 12.b. of the Charter of the City of Port Aransas, this Ordinance or the caption of it shall be read at three city council meetings with at least one week elapsing between each reading.

SECTION 4. SEVERANCE. If any part of this Ordinance is invalid or void or is declared to be so, then said part shall be severed from the balance of this Ordinance and said invalidity shall not affect the balance of this Ordinance, the balance of the Ordinance to be read as if said invalid or void portion thereof were not included, and the City Council declares that it would have adopted the valid portions of this Ordinance without the invalid parts and to this end the provisions of this Ordinance shall remain in full force and effect.

SECTION 5. PUBLICATION. As provided by Article III, Section 12.C. of the Charter of the City of Port Aransas, this Ordinance shall be published one time in the official newspaper of the City of Port Aransas, Nueces County, Texas, which publication shall contain the caption of this Ordinance stating in substance the purposes of same.

PASSED, ORDAINED, APPROVED AND ADOPTED this ***20th*** day of ***FEBRUARY,*** **2014.**

CITY OF PORT ARANSAS, TEXAS

Keith McMullin, Mayor

ATTEST:

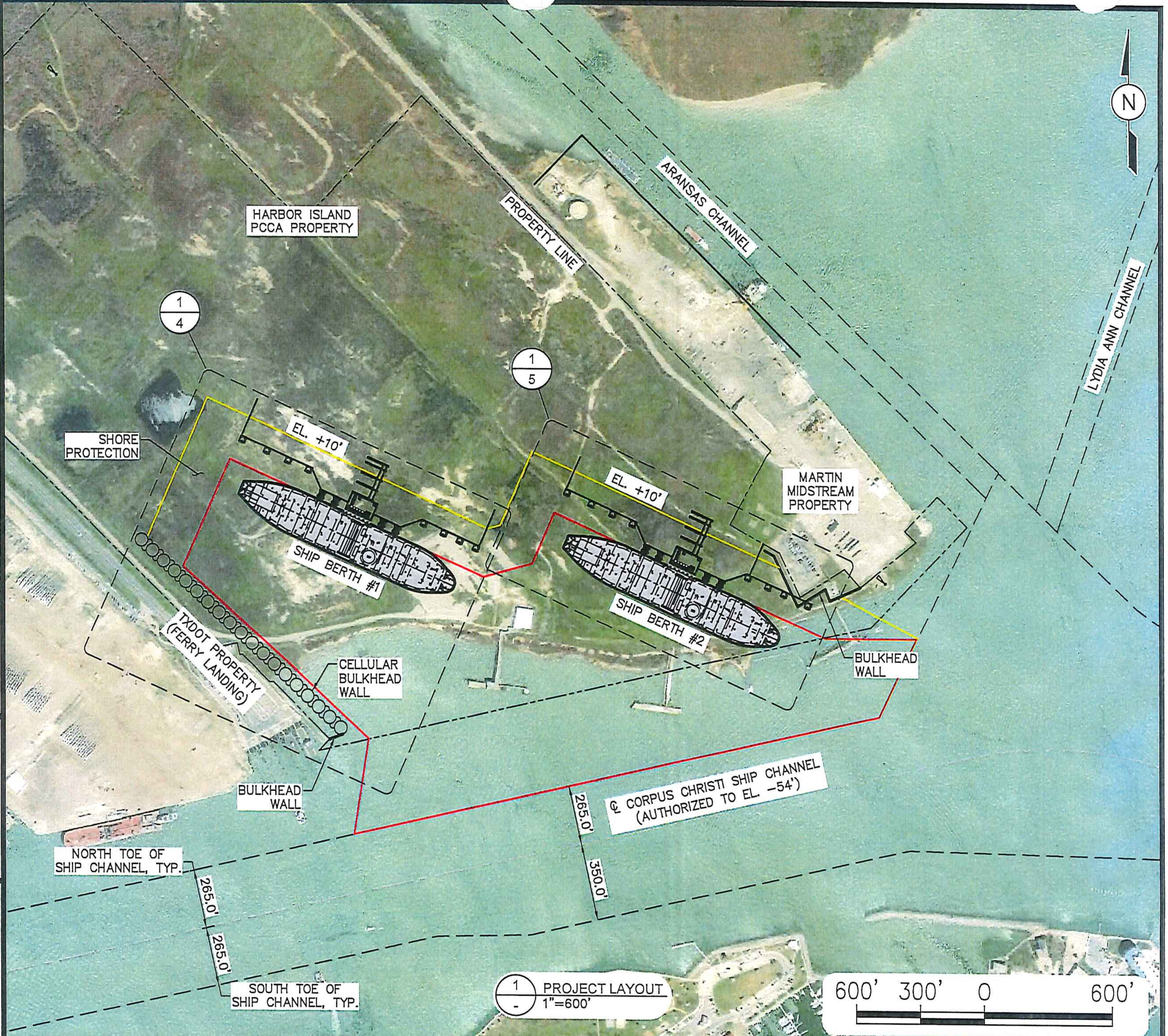
Irma Parker, City Secretary

First Reading: January 16, 2014
Second Reading: February 6, 2014
Third Reading: February 20, 2014

Appendix E

Site Plans

FILE NAME: L:\...ts\Port of Corpus Christi\Harbor Island VLCC Dock Design\6.0 Drawings\Permits\1 PROJECT LAYOUT. ...OUT NAME: PROJECT LAYOUT PLOTTED: Monday, July 08, 2019 – 3:19pm USER: jv



1
PROJECT LAYOUT
1"=600'

600' 300' 0 600'

PURPOSE: PROJECT LAYOUT

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	–
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	1

FILE NAME: L:\...s\Port of Corpus Christi\Harbor Island VLCC Dock Design\6.0 Drawings\Permits\2 DREDGING LAYOUT ...OUT NAME: DREDGING LAYOUT PLOTTED: Monday, July 08, 2019 - 3:19pm USER: jv

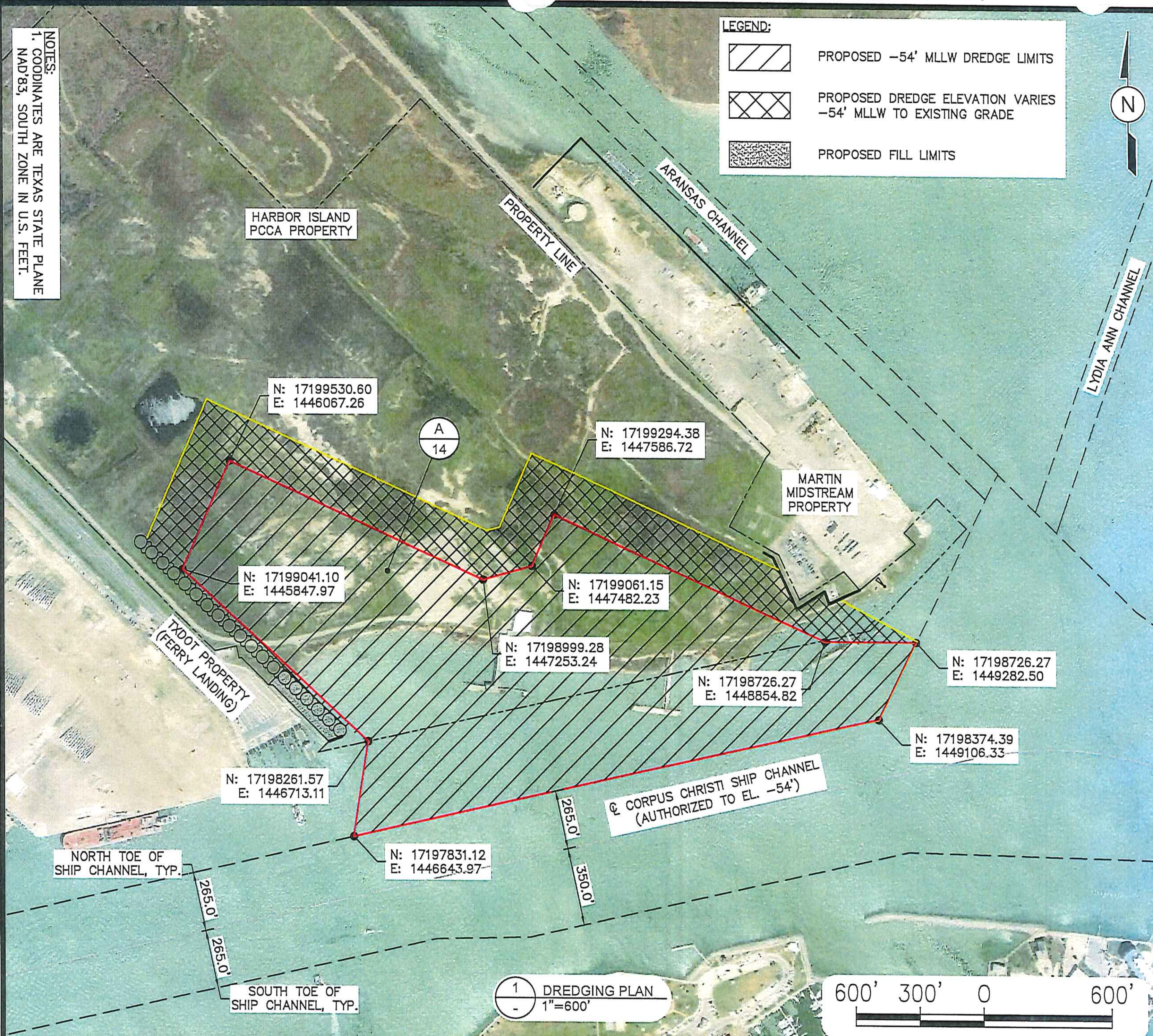
LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

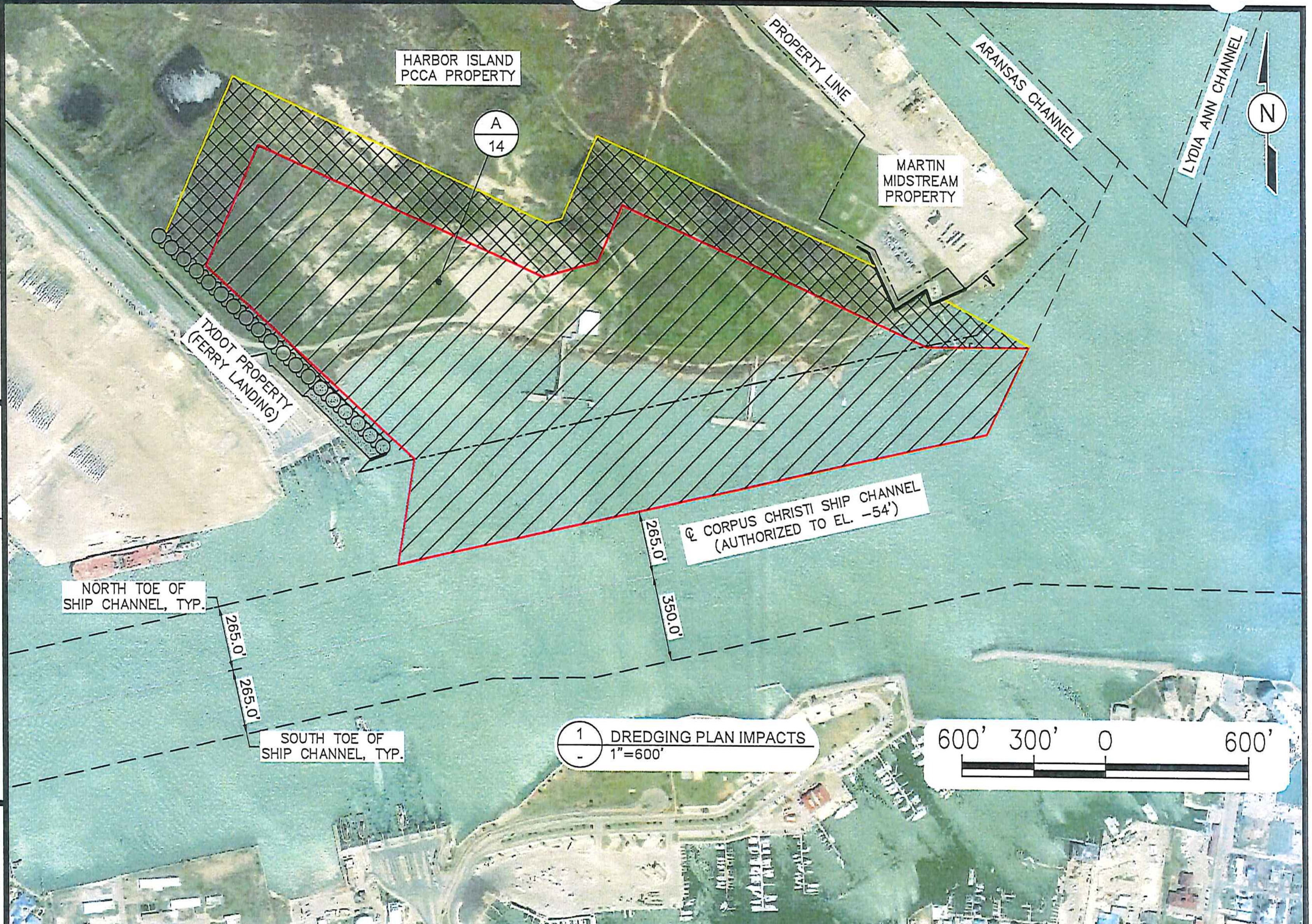
PURPOSE: DREDGING PLAN

OWNER: PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY: PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No: -
COUNTY: NUECES
WATER BODY: CORPUS CHRISTI SHIP CHANNEL
DATUM: MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY: KEM
DRAWN BY: JB
SCALE: AS NOTED
DATE: 07-05-19
SHEET No: 2





NOTES:

1. APPLICANT PROPOSES TO DREDGE AS FOLLOWS:
   a. TERMINAL BASIN: -54' AUTHORIZED DEPTH +4' ADVANCED MAINTENANCE +2' OVER DEPTH FOR A TOTAL DEPTH OF -60' MLLW
2. DREDGE AREAS:
   a. TERMINAL BASIN = 64.80 ACRES
3. APPROXIMATE AMOUNT OF MATERIAL TO BE HYDRAULICALLY AND MECHANICALLY (TERMINAL BASIN ONLY) DREDGED:
   a. TERMINAL BASIN = 6,500,000 CY
4. APPROXIMATE AMOUNT OF MATERIAL TO BE FILLED = 57,000 CY

LEGEND:

(diagonal hatch)	PROPOSED -54' MLLW DREDGE LIMITS
(cross hatch)	PROPOSED DREDGE ELEVATION VARIES -54' MLLW TO EXISTING GRADE
(stipple)	PROPOSED FILL LIMITS

PURPOSE: DREDGING PLAN IMPACTS

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER: PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY: PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No: -
COUNTY: NUECES
WATER BODY: CORPUS CHRISTI SHIP CHANNEL
DATUM: MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-02846

DESIGN BY: KEM
DRAWN BY: JB
SCALE: AS NOTED
DATE: 07-05-19
SHEET No: 3

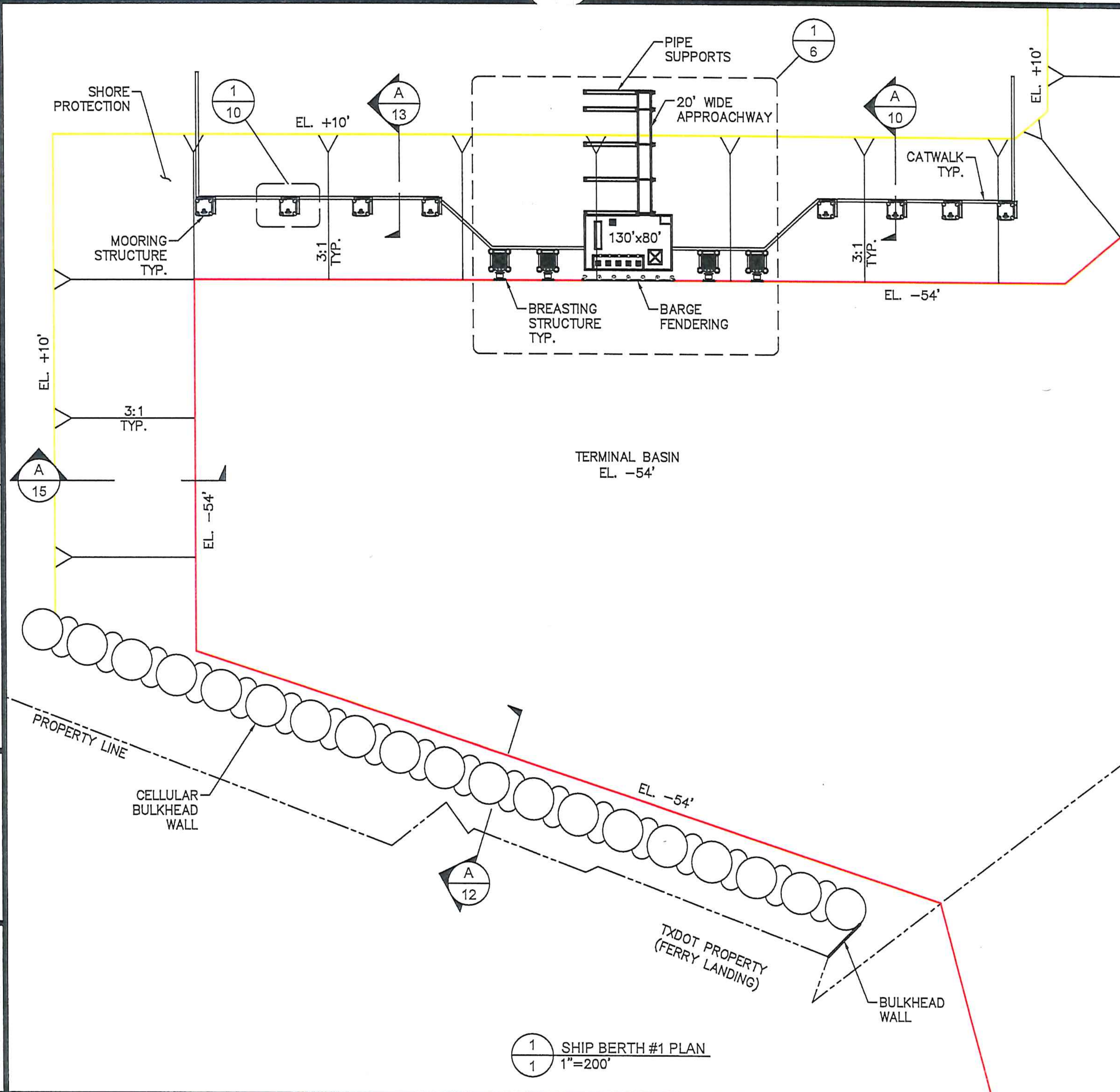
PURPOSE: SHIP BERTH #1 PLAN

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER: PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY: PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No: –
COUNTY: NUECES
WATER BODY: CORPUS CHRISTI SHIP CHANNEL
DATUM: MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY: KEM
DRAWN BY: JB
SCALE: AS NOTED
DATE: 07-05-19
SHEET No: 4



1/1 SHIP BERTH #1 PLAN
1"=200'

FILE NAME: L:\ ...s\Port of Corpus Christi\Harbor Island VLCC Dock Design\6.0 Drawings\Permits\5 SHIP DOCK #2 B ... LAYOUT NAME: SHIP DOCK #2 BERTH PLOTTED: Monday, July 08, 2019 – 3:20pm USER: jv

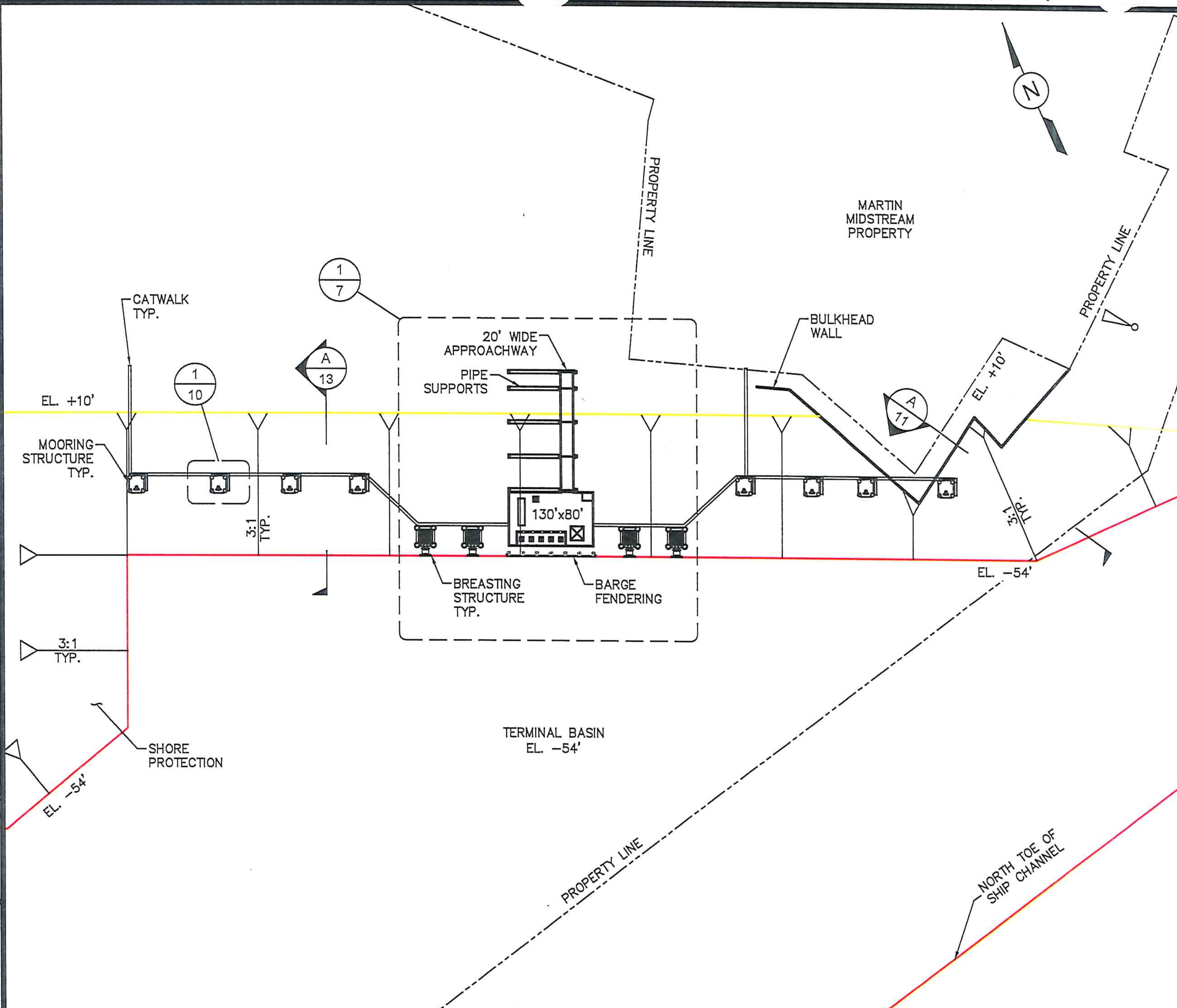
PURPOSE: SHIP BERTH #2 PLAN

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

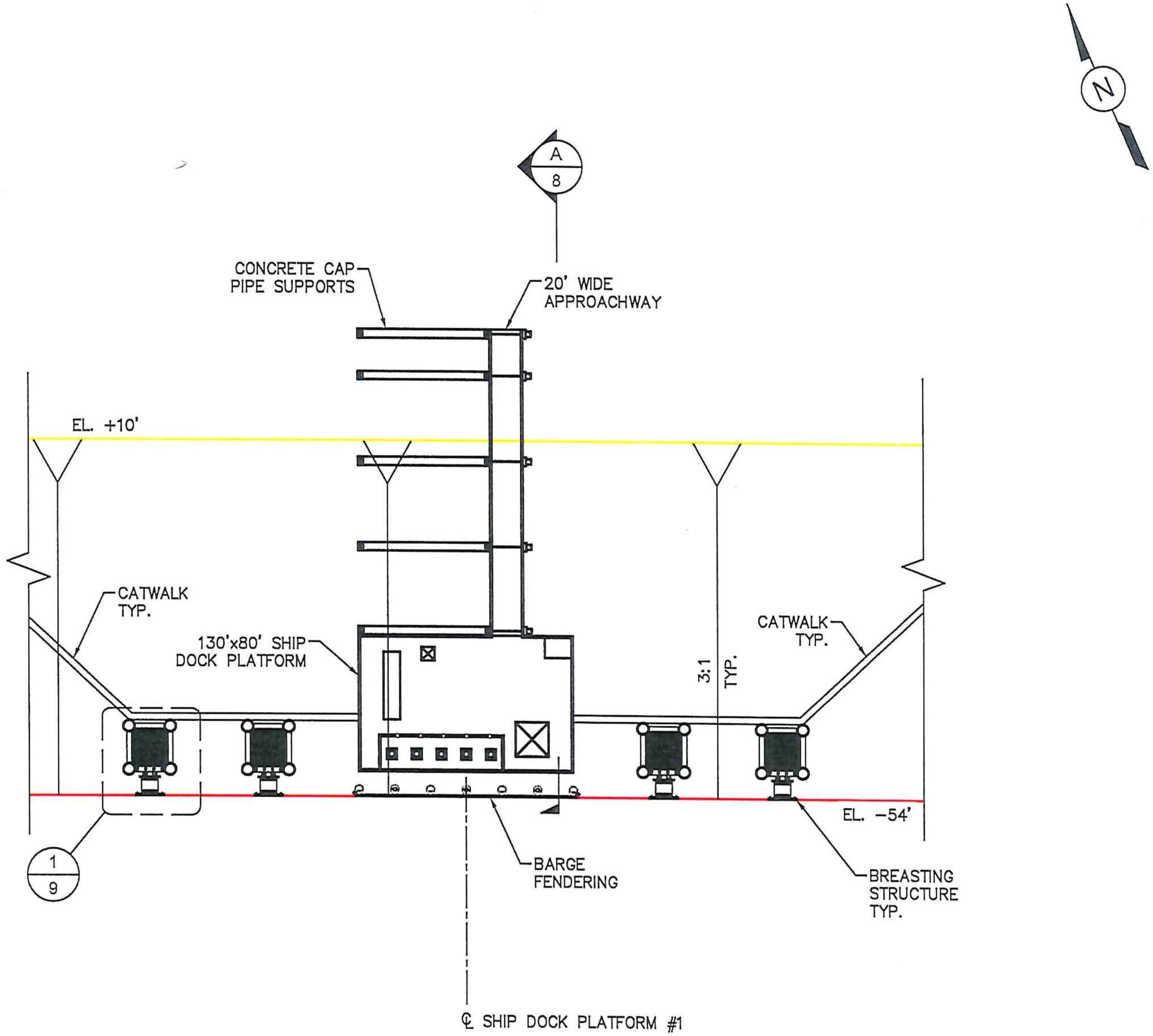
OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	–
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	5



1
1
SHIP BERTH #2 PLAN
1"=200'



1
4
SHIP DOCK #1 PLAN
1"=100'

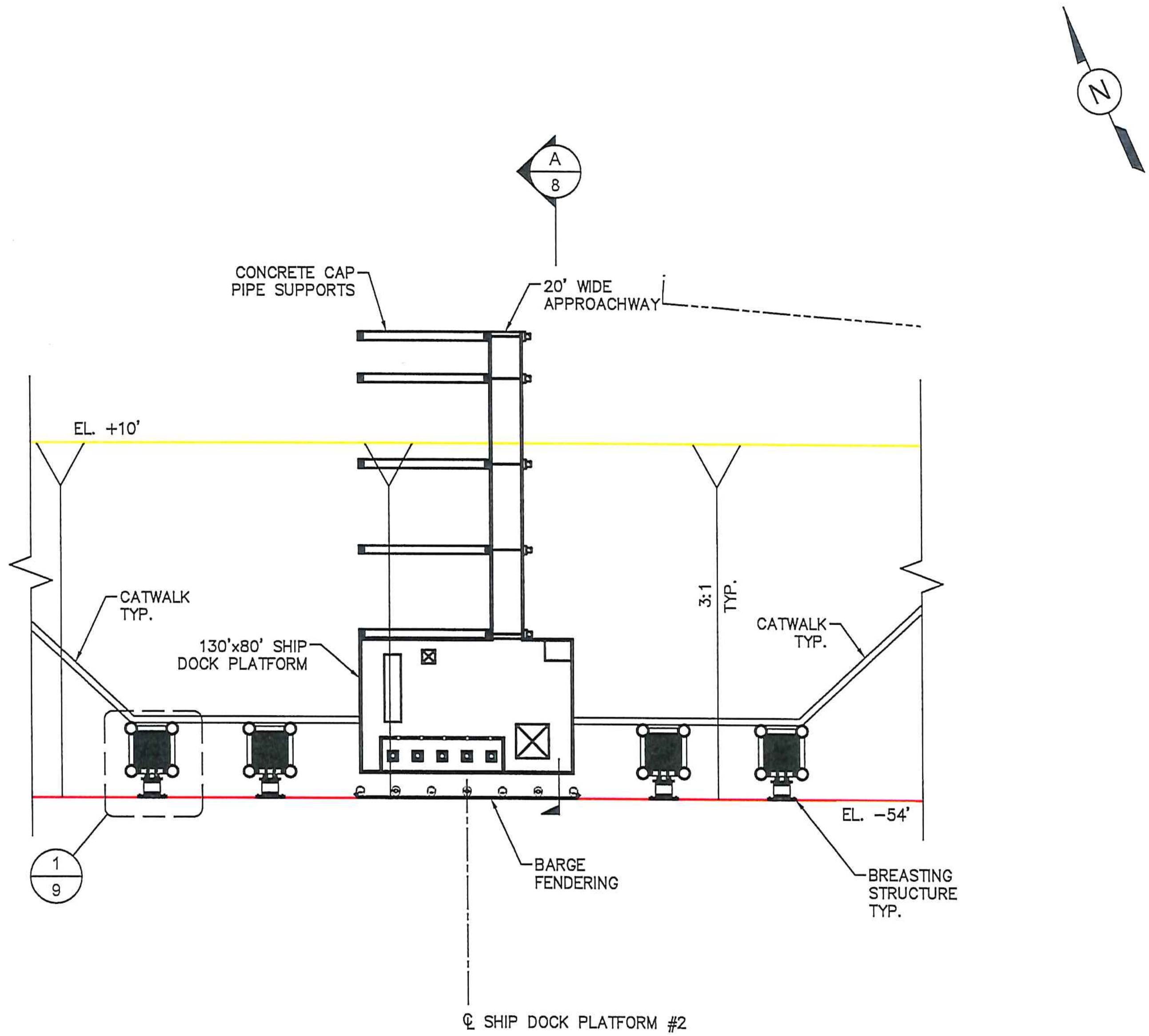
PURPOSE: SHIP DOCK #1 PLAN

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	–
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	6

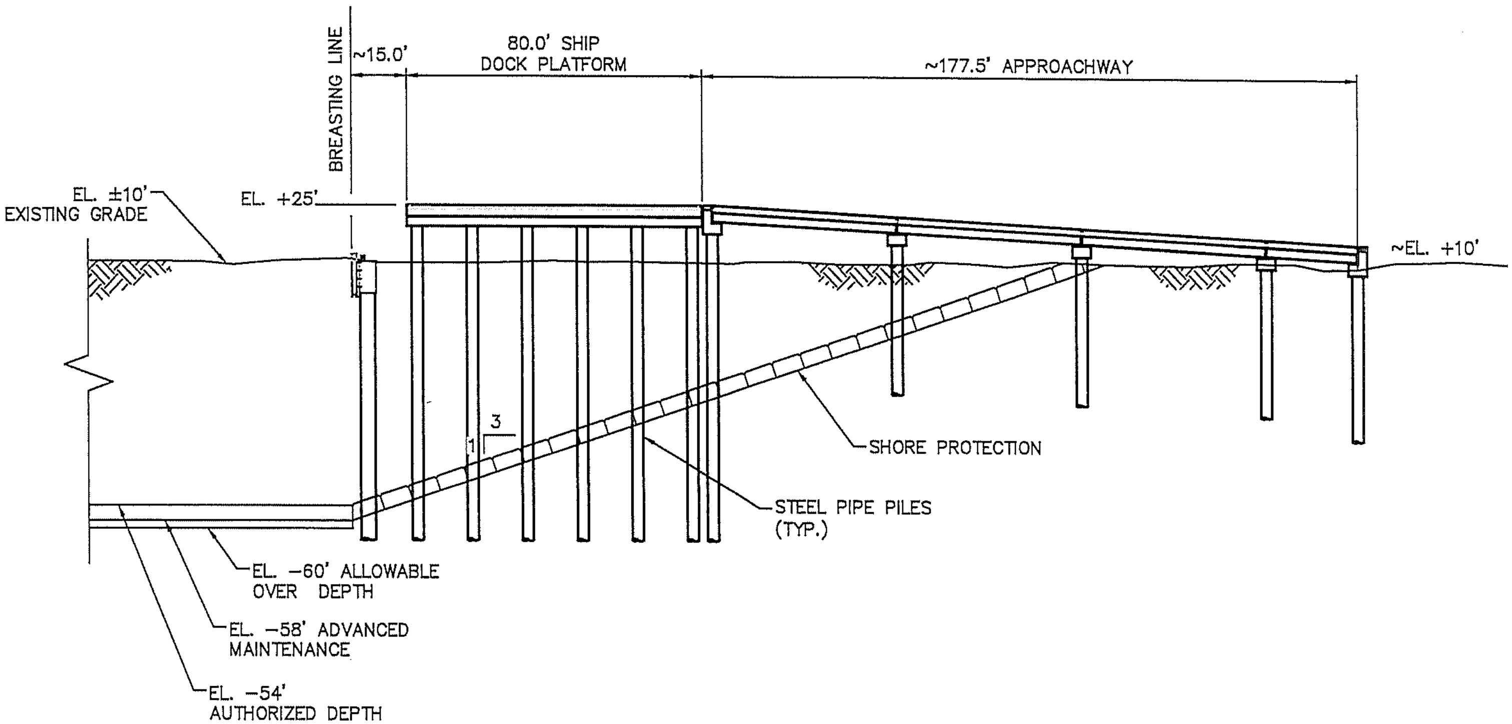


1/5 SHIP DOCK #2 PLAN
1"=100'

PURPOSE:	SHIP DOCK #2 PLAN
LOCATION:	HARBOR ISLAND, NUECES COUNTY, TEXAS
OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	-
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	7

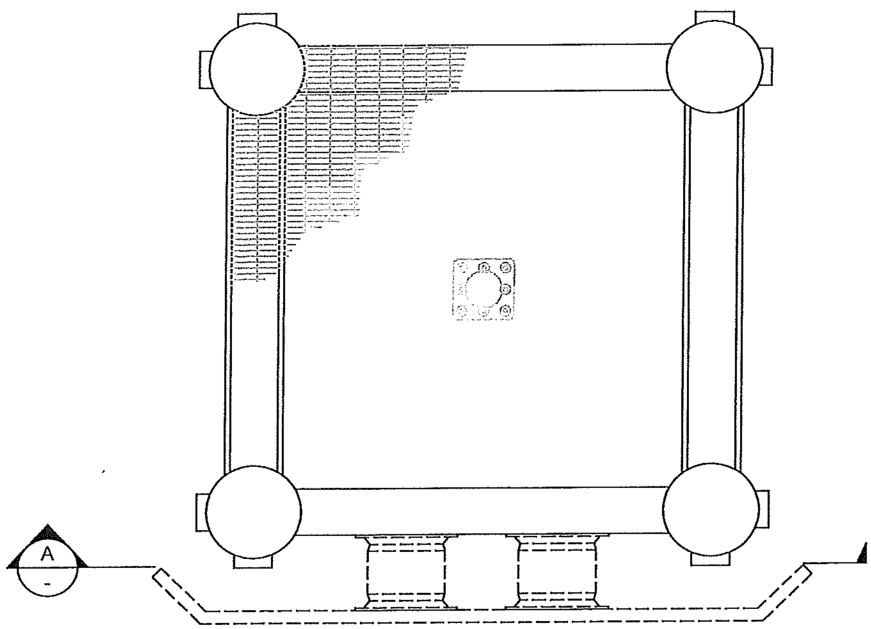


A
6,7
TYPICAL OVERALL SHIP DOCK SECTION
1"=50'

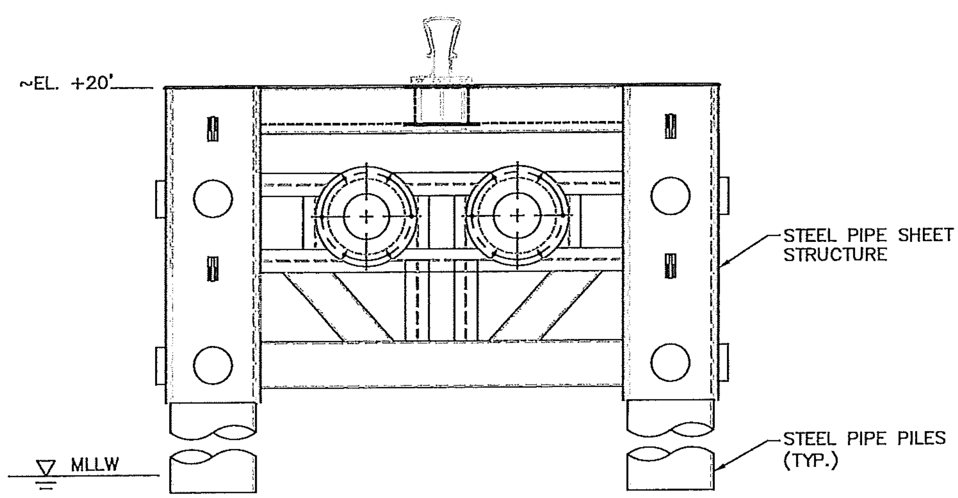
PURPOSE:	TYPICAL OVERALL SHIP DOCK SECTION
LOCATION:	HARBOR ISLAND, NUECES COUNTY, TEXAS
OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	-
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	8



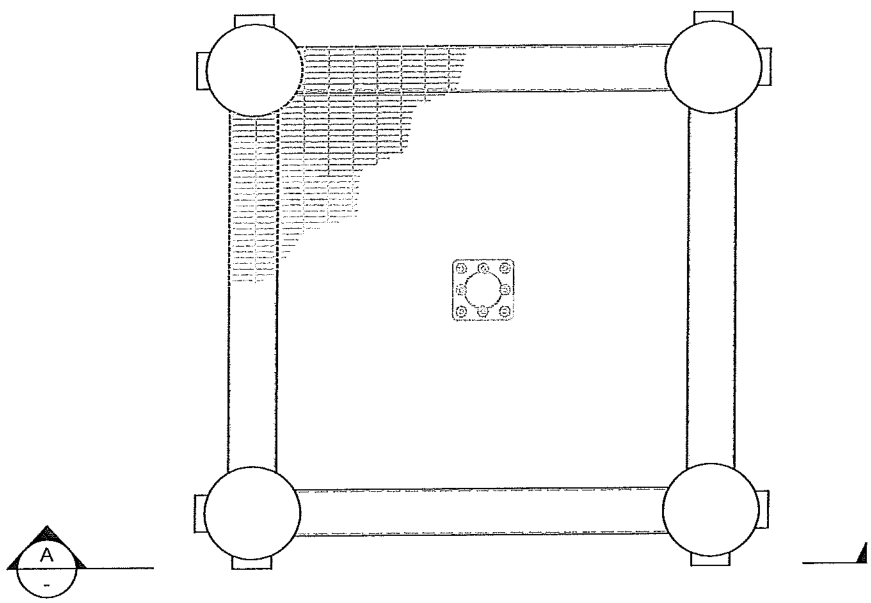
1 / 6,7 BREASTING STRUCTURE PLAN
1"=10'



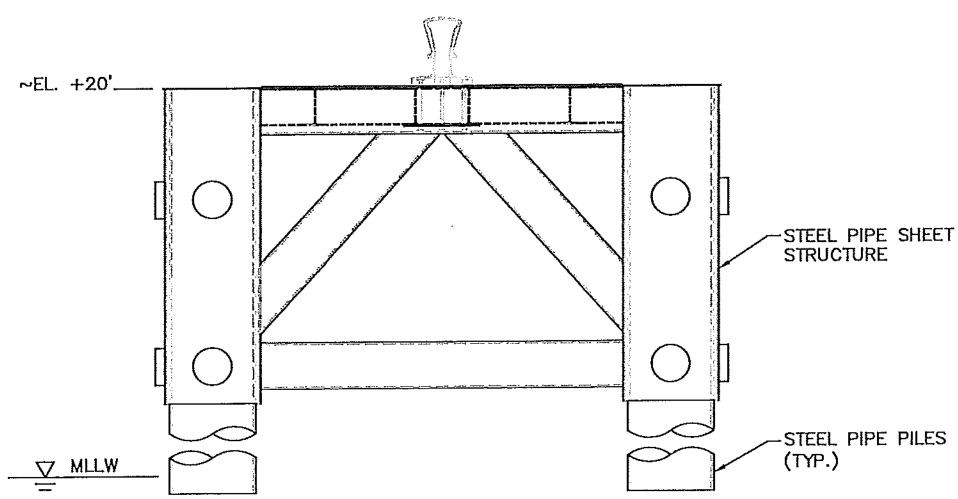
A / - BREASTING STRUCTURE ELEVATION
1"=10'

PURPOSE:	BREASTING STRUCTURE PLAN AND ELEVATION	OWNER:	PORT OF CORPUS CHRISTI AUTHORITY	DESIGN BY:	KEM
		APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY	DRAWN BY:	JB
		APPLIC. No:	–	SCALE:	AS NOTED
LOCATION:	HARBOR ISLAND, NUECES COUNTY, TEXAS	COUNTY:	NUECES	DATE:	07–05–19
		WATER BODY:	CORPUS CHRISTI SHIP CHANNEL	SHEET No:	9
		DATUM:	MLLW		

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846



1 / 4,5 MOORING STRUCTURE PLAN
1"=10'

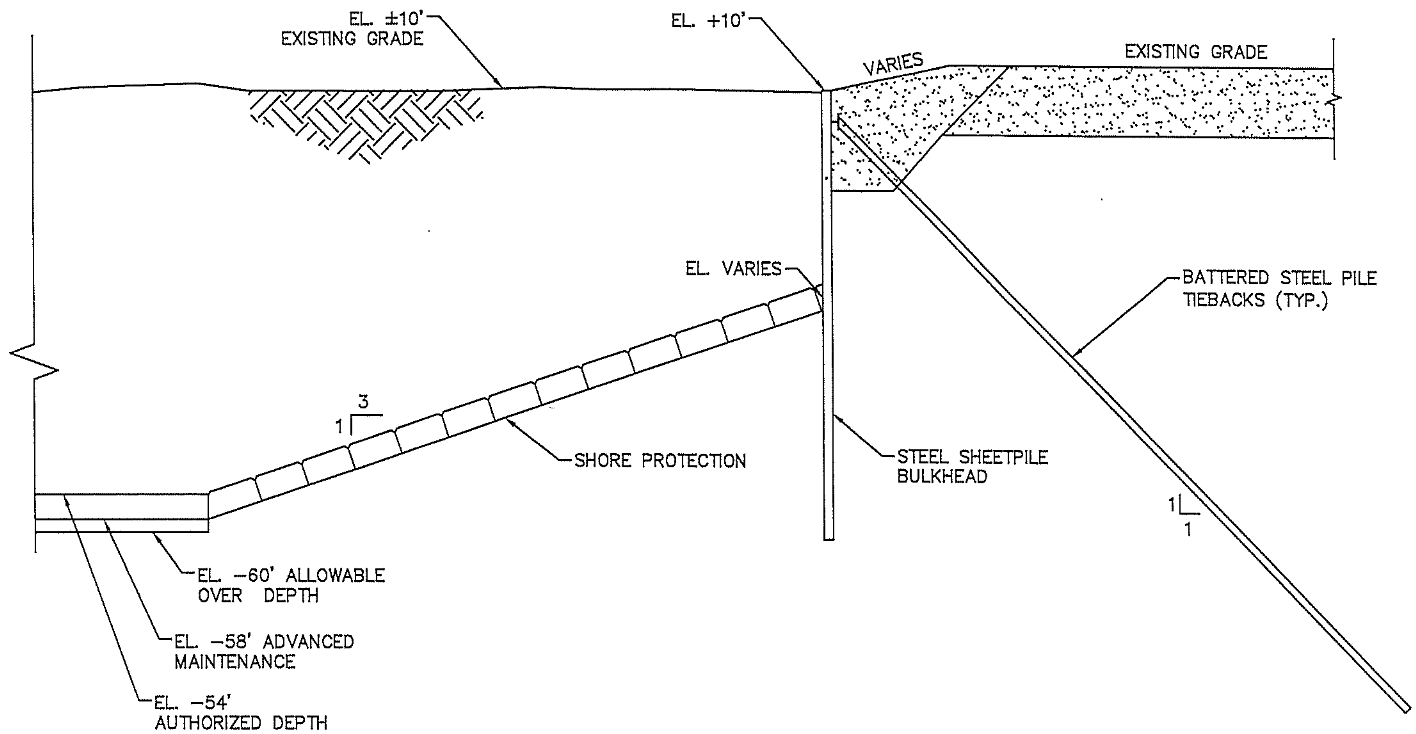


A / - MOORING STRUCTURE ELEVATION
1"=10'

PURPOSE:	MOORING STRUCTURE PLAN AND ELEVATION	OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
		APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
		APPLIC. No:	—
LOCATION:	HARBOR ISLAND, NUECES COUNTY, TEXAS	COUNTY:	NUECES
		WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
		DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	10



A
5
TYPICAL BULKHEAD SECTION
@ MARTIN PROPERTY
1"=30'

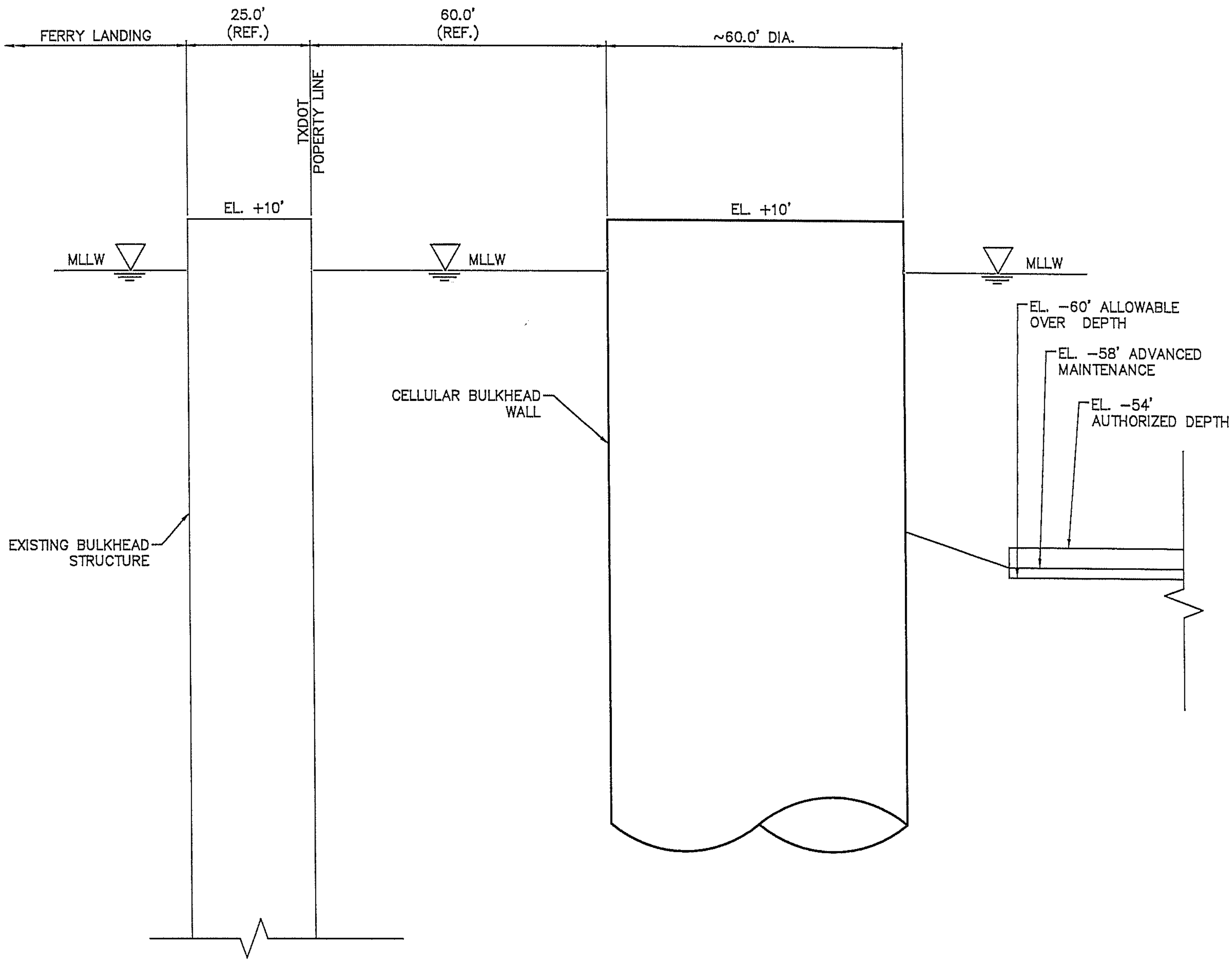
PURPOSE: TYPICAL BULKHEAD SECTION

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	-
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE No. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	11



A
4
TYPICAL CELLULAR BULKHEAD SECTION
@ TXDOT PROPERTY (FERRY LANDING)
1"=30'

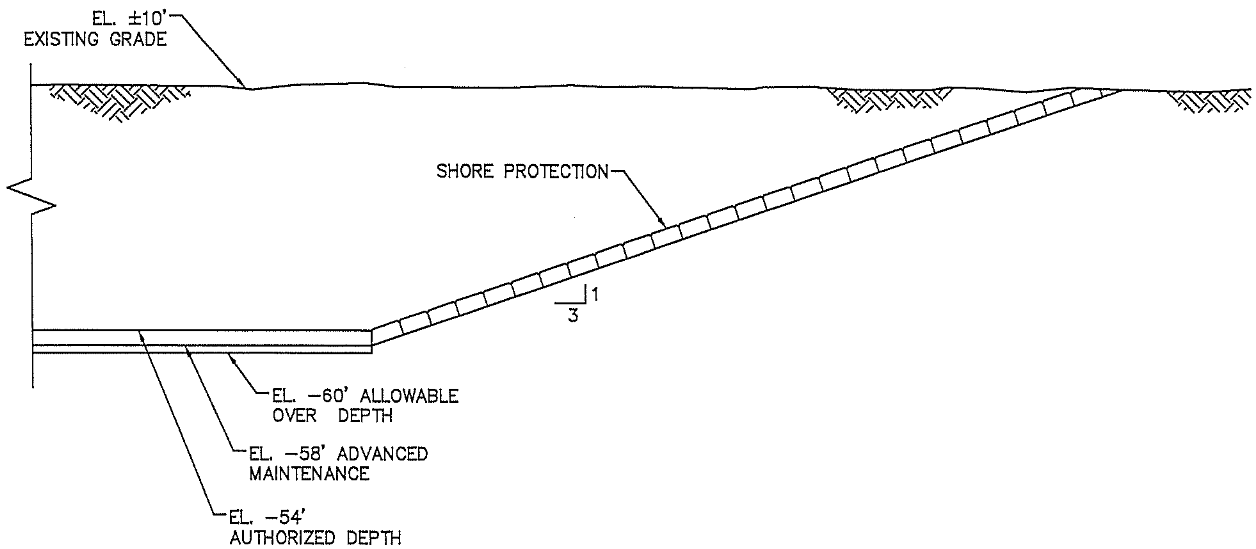
PURPOSE: TYPICAL CELLULAR BULKHEAD SECTION

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	-
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	12



A 4,5 TYPICAL SHORE PROTECTION SECTION
1"=50'

PURPOSE: TYPICAL SHORE PROTECTION SECTION

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	-
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	13

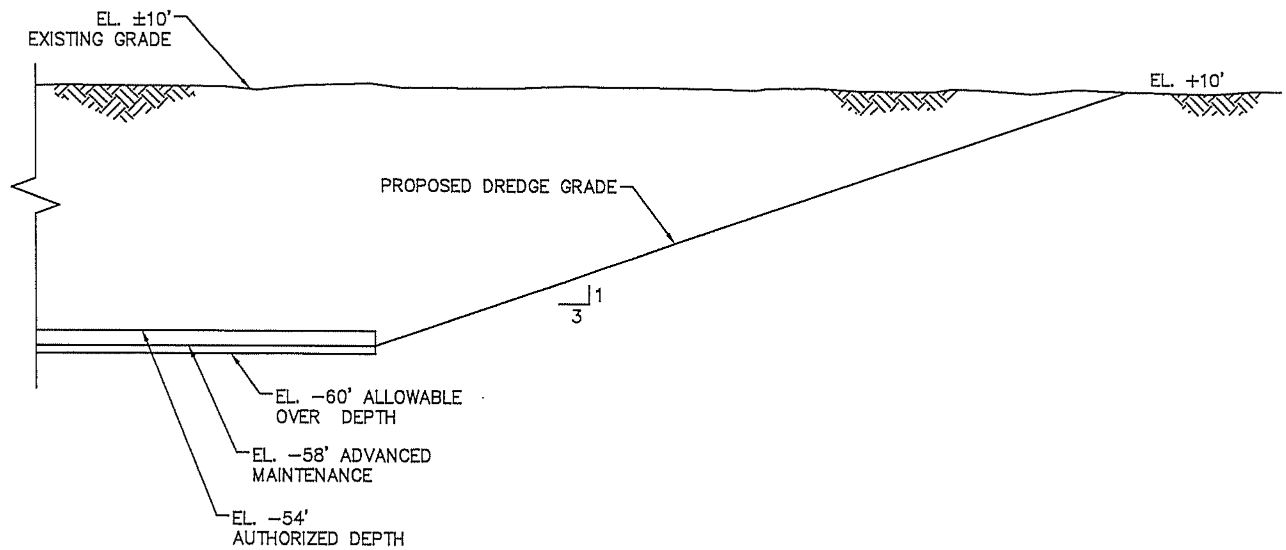
PURPOSE: TYPICAL DREDGE SECTION

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	–
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

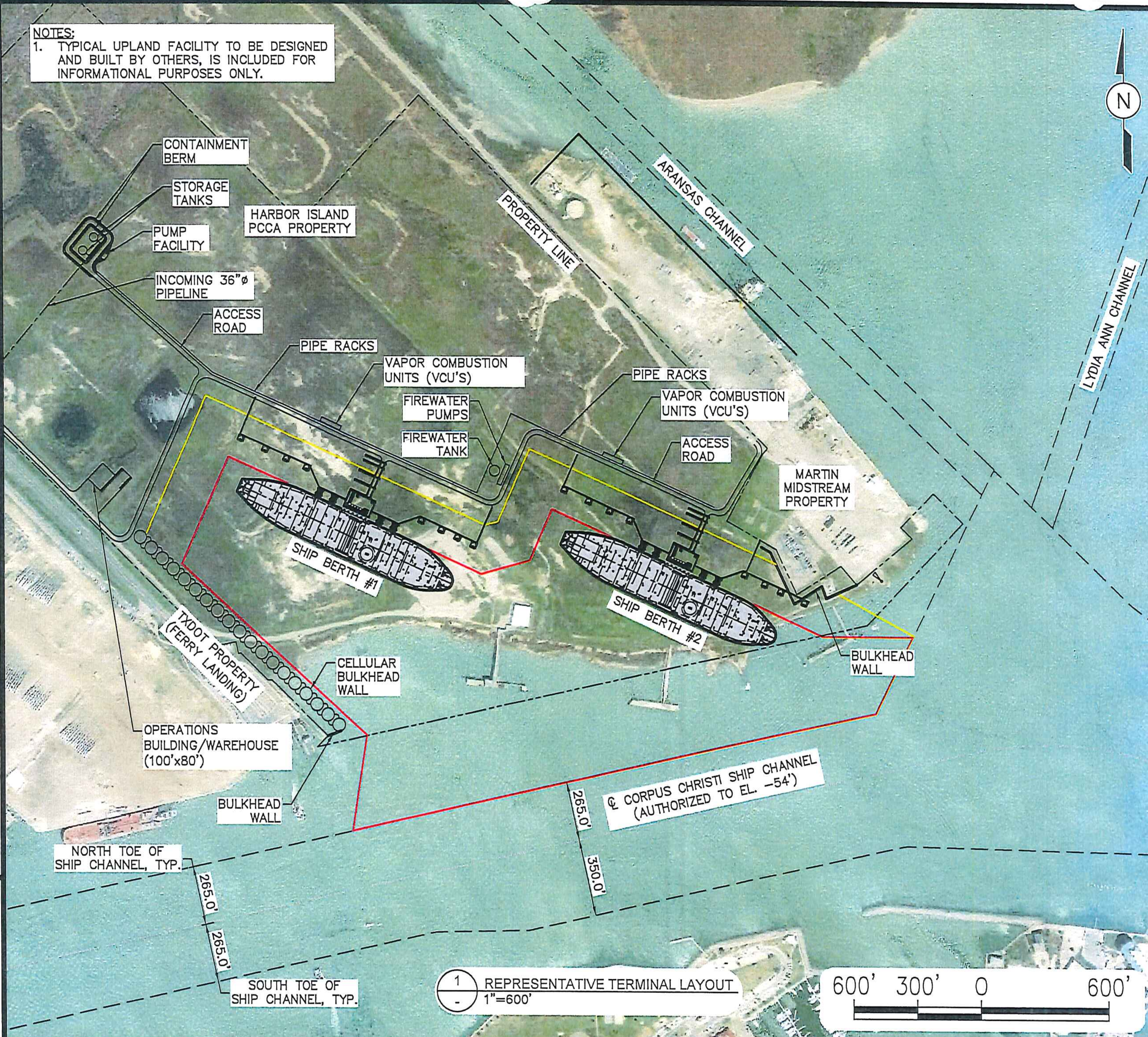
LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE NO. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	14



A/2 TYPICAL PROPOSED DREDGE SECTION
1"=50'

FILE NAME: L:\ s\Port of Corpus Christi\Harbor Island VLCC Dock Design\6.0 Drawings\Permits\15 REPRESENTATIVE LAYOUT.dwg LAYOUT NAME: PROJECT LAYOUT PLOTTED: Monday, July 08, 2019 – 3:21pm USER: jv



PURPOSE: REPRESENTATIVE TERMINAL LAYOUT

LOCATION: HARBOR ISLAND, NUECES COUNTY, TEXAS

OWNER:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIED BY:	PORT OF CORPUS CHRISTI AUTHORITY
APPLIC. No:	–
COUNTY:	NUECES
WATER BODY:	CORPUS CHRISTI SHIP CHANNEL
DATUM:	MLLW

LLOYD ENGINEERING, INC
STATE OF TEXAS, USA
LICENSE No. F-002846

DESIGN BY:	KEM
DRAWN BY:	JB
SCALE:	AS NOTED
DATE:	07-05-19
SHEET No:	15

Appendix F

Water and Sediment Sampling and Analysis Report

(Included on a CD as an Insert)

PORTCORPUSCHRISTI

Project Turnpike
Water and Sediment Sampling and Analysis Report

Wood Project No. 6703180051

For Submittal to:

Port of Corpus Christi Authority
222 Power Street
Corpus Christi, Texas 78401

Prepared by:

wood.

226 S. Enterprise Parkway
Suite 120
Corpus Christi, Texas 78405

June 2019

Table of Contents

List of Figures

List of Tables

List of Attachments

List of Appendices

1.0 Background and Approach

The Port of Corpus Christi Authority of Nueces County (PCCA) is planning to develop Project Turnpike, a crude oil export terminal at Harbor Island north of Port Aransas, Texas (**Figure 1**). The project requires two marine berths with a turning basin large enough to move Very Large Crude Carriers (VLCCs) into and out of the berths.

To develop baseline data for United States Army Corps of Engineers (USACE) permitting of Project Turnpike under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, Wood Environment & Infrastructure Solutions (Wood) proposed to collect sediment, benthic invertebrates, plankton samples, and measure water current velocity and quality parameters. These samples and measurements were proposed for the berth areas and turning basin.

2.0 Sample Collection

2.1 Overview

Sediment samples were collected for submerged aquatic vegetation, grain size, total organic carbon (TOC), and benthic macroinvertebrates to characterize local substrate. Water measurements and sampling consisted of current water velocity and water quality data. Plankton samples were collected. The plankton sample results identified the abundances and diversity of adult and larval marine species found within the water column. Oyster and seagrass surveys were also conducted to determine presence or absence of these habitats, and the extent of them if present. Photographic documentation of the field activities are provided in **Attachment 1**.

2.2 Sample Sites/Locations

Wood identified 15 sample sites for the project (**Figure 2** and **Table 1**). These 15 sample points include five locations within the turning basin, four within the planned turning basin near Berth 1A, and two locations within each of the three prospective berth locations.

Global Positioning System (GPS) coordinates were used to position the watercraft over the sample locations. Depth to sediment, water levels relative to the mean lower low water (MLLW), and other pertinent information was recorded on datasheets (**Attachment 2**) and by Naismith Marine (Naismith) at each sample location. The date and time of sample collection was recorded so that measurements could be correlated to water level measurements at the Port Aransas, Texas tide gauge (Station ID 8775237) and current measurements at the Port Aransas, Channel View current gauge (Station ID cc0301). Both stations are operated by the National Oceanic and Atmospheric Administration.

2.3 Sediment Sampling

Wood collected 14 sediment substrate samples using a Petite Ponar dredge (**Figure 3**). The dredge was brought onboard and emptied into a stainless-steel bowl. Multiple drops were necessary in some locations to collect sufficient volume for filling the sample containers. After sufficient sediment was retrieved it was inspected and described as to sediment type and color. After describing the material, it was thoroughly mixed before placing into clean sample containers provided by the laboratory. The sample containers were labeled and then placed into a cooler with ice. Samples were accumulated over the three days of sampling and maintained on ice. Upon completing the sediment sampling, the samples were repackaged and sent to the analytical laboratory under proper chain of custody documentation.

2.4 Benthic Macroinvertebrate Sampling

Benthic macroinvertebrate samples were collected with a Petite Ponar dredge at 15 sampling locations (**Figure 3**). The dredge was brought onboard and emptied into a plastic tub. The insides of the dredge were thoroughly rinsed to ensure all material was removed. The sediment in the plastic tub was emptied into a U.S. Standard No. 35 sieve with a 500 μm mesh. The material was thoroughly sieved to remove particles and organisms smaller than the designated mesh size. The remaining material on the sieve was transferred to a sample container and a magnesium sulfate solution was added to relax the organisms. The sieve was carefully inspected to ensure all organisms had been removed and placed into the sample container. Any organisms stuck in the mesh were removed with forceps and placed in the sample container. An internal sample label with the sample identification and collection date was added to each sample container. The sieve was gently scrubbed in between each sampling location to prevent contamination from one site to the next. Upon completion of fieldwork each day, samples were transferred to approximately a 10% formalin solution stained with Rose Bengal to fix the organisms. Samples were shipped to the Wood taxonomy laboratory in Newberry, Florida for processing by qualified taxonomists.

2.5 Water Quality Sampling

Wood collected water quality measurements at 15 sample sites presented in **Figure 4**. Wood measured water quality parameters of salinity, dissolved oxygen (DO), and temperature using a field calibrated meter (YSI 6920). Data was collected at 5-foot intervals from the surface to the bottom of the channel.

2.6 Seagrass and Oyster Surveys

Prior to mobilization, Wood performed a desktop survey of the area for the presence of known seagrass and oyster beds. Based on these results, neither seagrass or oysters were expected to occur in the designated sampling area. To confirm this, Wood personnel noted the presence or absence of seagrass and oysters during the sediment and benthic invertebrate sampling, and performed two additional surveys in areas where seagrass and/or oysters were suspected to occur. For the latter two surveys, the Petite Ponar dredge was used to collect approximately 30 samples in a grid pattern to look for the presence of seagrass or oyster beds (**Figure 5**). Additionally, shallow areas within the project boundary were visually evaluated to the extent possible.

2.7 Plankton Sampling

Plankton samples were collected at two different locations with a 333 μm, 0.5 m diameter conical mesh net equipped with a flow meter and removable collection container on the cod end (**Figure 6**). The net was towed from the boat in a manner that minimizes disturbance from the bow wake. The deployment consisted of a diagonal tow through the water column from approximately the mid-water column to the surface, to encompass varying depths. The net was deployed for approximately 10 minutes or the time necessary for a minimum of 50 cubic meters (m^3) of water to pass through the net, as indicated by the flow meter. Upon retrieval, the net was rinsed and back-rinsed through the mesh into the removable cup. The contents were transferred to labeled sample containers and preserved with 4% formalin. An internal sample label with the sample identification and collection date was added to each sample container. Samples were shipped to Wood's taxonomy laboratory in Newberry, Florida for processing.

2.8 Water Velocity

Wood collected water velocity measurements at 24 sample sites presented in **Figure 7**. After setting upon the sample locations Wood measured the current velocity during a flood and ebb tide using a Valeport 106 Water Velocity Meter. Documentation included the tidal chart for the day of sampling and the time, location, and depth of each measurement to MLLW using the Port Aransas, Channel View current gauge (Station ID cc0301) and Port Aransas, Texas tide gauge (Station ID 8775237). Data were collected at 5-foot intervals from the surface to the bottom of the channel.

2.9 Deviations

Wood had deviations in sampling locations due to lack of substrate to sample, sediment depth greater than project dredging depth, weather, and safety issues. Sediment samples were collected at 14 locations instead of 15. This was due to sample L-6 lacking sediment which could be collected in the Petite Ponar dredge. Only shell hash was retrieved with the 14 drops of the dredge. Sample locations L-5 and L-6 were moved from the south side of the turning basin to the north side of the turning basin because the depth to sediment at the proposed locations was deeper than the project dredging depth. Visibility issues were cited when collecting water velocity readings during the night.

3.0 Analyses

3.1 Physical and Chemical Analyses

The sediment samples were shipped to ALS Laboratories, Inc. (ALS) in Houston, Texas. ALS analyzed the samples for TOC using United States Environmental Protection Agency Method 1995. ALS subcontracted with Tolunay-Wong Engineers, Inc. (TWE) for the grain size analyses which was performed using American Society for Testing and Materials Method D422 and hydrometer analyses. ALS is an accredited laboratory recognized by the National Environmental Laboratory Accreditation Program.

3.2 Laboratory Quality Control

ALS reported that the recovery of the matrix spike (MS) and/or matrix spike duplicate (MSD) for sample L-2 MS and L-2 MSD were outside of established control limits. However, the laboratory control sample was within control limits and the recovery of the MS/MSD was due to sample matrix interference. Otherwise, ALS and TWE reported no quality control issues and the analytical results were accepted.

3.3 Chain of Custody

As previously described, samples were shipped to the analytical laboratories under proper chain of custody. Copies of the chains of custody are included in the laboratory reports (**Attachment 3**).

3.4 Laboratory Deviations

The laboratories reported no deviations to their standard operating procedures or analytical methods.

3.5 Benthic Macroinvertebrate Sample Processing

Benthic macroinvertebrate samples were processed in the laboratory following guidance provided by the Texas Commission on Environmental Quality (TCEQ) in "*Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data*". Upon receipt of the benthic invertebrate samples by the Wood taxonomy laboratory, the samples were cross-checked against the chain of custody and logged in. Prior to sorting, the formalin was poured off through a sieve, captured and adequately disposed of. The sample was rinsed in freshwater and then preserved in 70% isopropyl alcohol. Samples were sorted in their entirety by placing small aliquots in petri dishes and sorted under a dissecting microscope by removing organisms from debris and placing them into vials filled with 70% isopropyl alcohol. Internal labels were added to the vials with the sample identification and collection date. Ten percent of samples were checked by a second qualified individual to ensure that 90% sorting efficiency has been achieved. If sorting efficiency falls below 90% for an individual, the remaining samples that this individual processed were resorted.

Benthic macroinvertebrates from each sample were enumerated and identified by qualified taxonomists to the lowest practical taxonomic level, which was usually species level. This was not always possible for immature or damaged organisms, and was noted on the laboratory bench sheets. Organisms were identified using various dissecting and compound microscopes along with appropriate taxonomic keys and references. Wood's extensive voucher collection was also used as reference. Five percent of samples were identified and enumerated by a second taxonomist for quality control. A photograph log can be found in **Attachment 4**.

Data were entered into a Structured Query Language (SQL) relational database and exported to Excel for reporting requirements. A phylogenetic taxonomic list with raw abundances and densities in terms of number of benthic macroinvertebrates per square meter were provided for each sample. PRIMER v7 was utilized to calculate various richness and diversity indices. Nonparametric multivariate statistical analyses were performed to determine significant spatial trends in the benthic community and correlations with the environmental variables.

3.6 Plankton Sample Processing

In the laboratory, samples were processed according to the methods described in APHA 10200 (1995). Upon receipt of the plankton samples by the Wood taxonomy laboratory, the samples were cross-checked against the chain of custody and were logged in. Prior to sorting, the formalin was poured off through a sieve, captured and adequately disposed of. The sample was rinsed in freshwater and then preserved in 70% isopropyl alcohol. The samples were viewed under a stereoscopic microscope and ichthyoplankton were removed from the entire sample and placed into a vial of 70% isopropyl alcohol and labeled with the sample ID and date of collection.

Subsampling with a Folsom plankton splitter was employed following removal of ichthyoplankton due to the large number (>500) of organisms present in the zooplankton samples. On a level surface, each sample was placed into the splitter and divided into sub-splits. The splitter was rinsed into the subsamples to remove any organisms stuck on the device. This splitting process was conducted five times in order to achieve a target number of approximately 200-500 individuals present in the analyzed subsamples.

Ichthyoplankton and zooplankton organisms from each sample were enumerated and identified by qualified taxonomists to the lowest practical taxonomic level, which is usually species. This is not always possible for immature or damaged organisms, so this was noted on the laboratory bench sheets. Zooplankton were identified to lowest possible taxonomic level by using a stereoscopic microscope capable of a magnification of 10-63x and/or a differential interference contrast compound microscope equipped with a magnification range of 40-1000x. Enumerations were conducted with a multiple tally counter. Ichthyoplankton were identified and enumerated under a stereoscopic microscope at magnification of 10-50x. Appropriate taxonomic keys, references, and Wood's extensive voucher collection were also used to aid identification.

Data were entered into a SQL relational database and exported to Excel for reporting requirements. A phylogenetic taxonomic list with raw abundances and densities in terms of number of organisms per cubic meter of water was provided for each sample. PRIMER v7 was utilized to calculate various richness and diversity indices. Nonparametric multivariate statistical analyses were also performed to determine significant spatial trends in the plankton community and correlations with the environmental variables.

4.0 Analytical Results

4.1 Sediment Samples

Results for the sediment samples are presented in **Table 2**. The sediment sampled was visually characterized as predominantly fine sand with silt and clay present. The color of the sediment was predominantly gray with some samples containing a black clay and had no odor. Shell hash was also observed in several samples.

The grain size analyses are presented in **Table 3**. Coarse gravel ranged from 0.0% to 1.2%, fine gravel from 0.0% to 59.6%, coarse sand from 0.0% to 8.9%, medium sand from 0.1% to 6.8%, fine sand from 32.1% to 95.6%, silt from 2.0% to 53.1%, and clay from 1.5% to 16.3%. Sediment samples from L-4, L-12, and L-13 were the only samples to contain gravel which was identified in the field as shell or shell hash. L-13 contained the highest amount of gravel (shell hash) with a composition of 59%.

TOC concentrations (**Table 3**) ranged from non-detect in samples L-5, L-7, L-8, L-9, and L-15 to 0.515 weight%-dry in sample L-11. ALS reported the sample detection limit and method quantitation limit as 0.0600 weight%-dry. Sample locations with TOC detections were located closer to land or near tributaries. TOC was not detected in samples collected in the proposed turning basin. Samples collected from L-11 and L-13 located in the Tributary Channel to Aransas Pass had the highest TOC concentrations.

4.2 Benthic Macroinvertebrate Samples

A total of 167 different taxa and 1,523 individuals were identified from the 15 benthic macroinvertebrate samples (**Appendix 1**). The raw abundances were converted to densities by dividing by the area of the Petite Ponar grab. The densities ranged from 258 to 31,172 individuals/m^2 (**Table 4**). Various diversity indices were calculated with the DIVERSE function in

PRIMER v7 for each of the samples and are displayed in **Table 4**. Samples from L-5, L-7, L-8 and L-9 had the lowest abundance, number of taxa, Margalef's richness, and Shannon's diversity indices. Alternatively, the sample from L-2 exhibited the highest density due to numerous juvenile bivalve shells belonging to the Family Tellinidae and polychaete worms belonging to the genus *Mediomastus*. Samples from L-6 and L-12 had the highest Margalef's richness scores, while higher Shannon's diversity were observed from Samples L-4, L-12, and L-15.

Several nonparametric multivariate statistical analyses were performed in PRIMER v7 to examine spatial trends in the benthic macroinvertebrate community. Bray-Curtis similarities were calculated between samples to produce a resemblance matrix (Bray and Curtis, 1957; Clarke *et al.*, 2006). The CLUSTER analysis, which uses hierarchical agglomerative clustering with group average sorting, was applied to the Bray-Curtis resemblance matrix. Similarity profile permutation tests (SIMPROF) used 1000 permutations to identify significant sample groups within the dendrogram produced by the CLUSTER analysis. The CLUSTER analysis results depicted five groups of samples that were significantly different than each other (**Figure 8**). Solid black lines indicated significant differences between samples or sample groups ($p<0.05$), while red dotted lines indicated no significant differences ($p>0.05$). The sample group consisting of L-5, L-7, L-8, and L-9 was significantly different than the rest of the samples and consisted of samples that were characterized by low abundances, richness, and diversity. Samples from L-2 and L-6 were significantly different from all other samples due to higher abundances within these samples that were at least double that in the remaining samples. Samples from L-4, L-12, L-13, L-14, and L-15 comprised the fourth group and exhibited fairly high richness and diversity. Samples from L-1, L-3, L-10, and L-11 comprised the last group which was characterized by moderate richness and diversity (**Table 4**).

Additionally, Bray-Curtis similarities were ordinated with non-metric Multidimensional Scaling (nMDS). The 5% significance level was used as a factor in the nMDS to further illustrate the significant relationships between the sample groups in 2-D space (**Figure 9**). The closer the sample points were to each other the more similar their benthic community structure. Similar sample grouping was observed in the nMDS as compared to the CLUSTER dendrogram. Analysis of Similarity (ANOSIM) confirmed statistically significant differences between the five sample groups represented in the CLUSTER dendrogram and the nMDS plot ($p<0.05$).

The BEST analysis with the BIOENV option was performed in order to ascertain which combination of the physicochemical parameters (grain size, %TOC, depth, salinity, DO, and temperature) were best correlated with the observed benthic community structure. No significant correlations were observed with any of the physicochemical parameters or any combination of these parameters ($p>0.05$).

4.3 Water Quality

Water quality measurements varied throughout the sample locations (**Table 5**). In general, DO in the ship channel and tributary increased with depth. In deeper waters (Turning Basin), DO varied with depth but tended to decrease with depth. Salinity was variable between each sampling point and the measurements generally increased slightly with depth. Sampling points with the highest salinity were points L-1, L-7, and L-8. These readings ranged from 22.48 parts per thousand (ppt) to 25.07 ppt. The sampling points with the lowest salinity were recorded at L-9 and L-10. These readings ranged from 15.32 ppt to 15.52 ppt. In general, water temperature in the Turning Basin decreased as depth increased. In the shallower locations (the tributary and ship channel), temperature generally decreased as depth increased. However, sample points L-2, L-13, and L-14 all showed increasing temperature as depth increased.

4.4 Seagrass and Oyster

Shallow areas of the sampling area were visually inspected during the field sampling effort for the presence of seagrass or oyster beds. No seagrass or oyster beds were observed in these shallow areas from the boat. While collecting the sediment and benthic macroinvertebrate samples at Sites L-2 and L-14, one live strand of *Halodule wrightii* was retrieved at each station (**Table 6**). No live oysters were retrieved in any of the sediment or benthic macroinvertebrate grab samples collected in the sampling area.

Based on the slight presence of *H. wrightii* at these two sampling locations, transects were setup to ground truth the presence of seagrass beds, and if present, the extent of these beds. One transect was located in between Sites L-1 and L-2, while the other transect was located in a shallow area with decent water clarity near Site L-12 and across the Tributary Channel from Site L-14. A seagrass transect was not conducted near Site L-14 because of its close proximity to a seawall, water with poor visibility and heavy boat traffic where seagrass would be unlikely to occur (**Figure 5**). Fifteen Petite Ponar grab samples were collected along each of the two transects. Seagrass was not found in any of the grab samples from the first seagrass transect (SG-1), and only two strands of *H. wrightii* were retrieved in one of the grab samples from the second seagrass transect (SG-2) (**Table 6**). Based on these observations, seagrass and oyster beds are unlikely to occur in the sampling area. The slight presence of one to two live strands of seagrass collected in a few of the grab samples was incidental. These strands were most likely not rooted in the sampling area and drifted in from a seagrass bed near the vicinity of the proposed project area.

4.5 Plankton Samples

A total of 37 different taxa and 1,539 individuals were identified from the two ichthyoplankton samples and zooplankton subsamples (**Appendix 2**). Zooplankton samples were split five times in order to reach the target number of 200-500 organisms in the subsample selected for taxonomic identification. Therefore, raw abundances from the identified zooplankton subsamples were multiplied by 32 in order to estimate the total number of each taxon in the entire sample. These estimates were combined with the ichthyoplankton abundances to represent the entire plankton sample. The abundances in the entire plankton sample were then converted to densities by dividing by the volume of water that passed through the plankton net during sample collection. Total plankton densities were 228/m^3 and 187/m^3 for P-1 and P-2 respectively. Both samples had fairly high taxa richness; however, the plankton samples were dominated by calanoid copepods belonging to the Family Pontellidae. This dominance led to lower diversity scores (see **Table 4**).

Because only two plankton samples were collected, the CLUSTER analysis with the SIMPROF option was the only nonparametric multivariate analysis performed in PRIMER v7. Four samples are needed for nMDS and three samples are needed for the BEST analysis. The CLUSTER analysis determined the two plankton samples were 75% similar and not significantly different than each other (**Figure 10**).

4.6 Water Velocity

Velocity measurements were variable throughout the site by location and depth (**Table 7**). As expected, velocities were generally higher in open water and decreased near shore and near the channel bottom where friction losses would be expected. Flows typically ranged from 0.1 to 0.5 m/s, or 0.3 to 1.5 ft/s.

5.0 Conclusions

Sediment in the study area is predominantly fine sand with abundant silt and clay. Shell hash was present in about a third of the samples.

Significant spatial variability in the benthic macroinvertebrate community structure was observed in the sampling area. Samples L-2 and L-6 were significantly different from all other samples, and exhibited higher abundances and diversity. Sample L-2 consisted of dead seagrass blades which had several different types of epiphytic organisms growing on them, thereby provided more habitat structure and food for benthic macroinvertebrates. Sample L-6 contained a moderate amount of shell hash which provided habitat for several different types of organisms such as: epiphytic organisms attached to the shell pieces; polydorid polychaete worms that bore into the shell pieces; and corophiid amphipods that form mud tubes within the crevices of the shell hash (Hartman, 1941; LeCroy, 2004). Moderate to high abundances and diversity were observed in samples taken from shallow water along the south and east sides of Harbor Island and the east side of the Tributary Channel. The samples with the lowest abundances and diversity were all similar to each other and all located in the proposed turning basin which is also the confluence of the three main shipping channels. Variable currents within this area and potential disturbance from ship traffic may be contributing to unfavorable conditions for benthic macroinvertebrates.

Water quality parameters varied throughout the study area. Generally, DO increased with depth in the channel area and tributaries but decreased with depth in the turning basin. Salinity also generally increased slightly with depth. Temperature generally decreased with depth.

Only several strands of seagrass were observed in the study area and no live oysters were observed. Sampling in areas where seagrass and oysters might be expected indicated no presence. Seagrass and oyster beds are unlikely to occur in the project area.

Plankton community structure did not exhibit any spatial variability as the two tows were 75% similar to each other. Both samples were dominated by calanoid copepods belonging to the Family Pontellidae which drove down the diversity scores. Alternatively, taxa richness was fairly high in both tows. The plankton community at Harbor Island was comprised of both holoplanktonic (organisms that are planktonic their entire life) and meroplanktonic (organisms that are planktonic only part of their life) organisms. Detrimental effects from dredging and construction of the berths around Harbor Island are unanticipated for the holoplankton community as sufficient current and tidal exchange was observed in this area which would replenish any losses to this community. A slight reduction in the meroplanktonic larvae may occur due to losses in the benthic community as discussed below, but would recover upon re-establishment of a reproductively-viable benthic community.

Velocity measurements were variable throughout the site and were generally higher in open water and decreased near shore and near the channel bottom.

Dredging and construction of the berths around Harbor Island will have an immediate impact on the benthic community due to the physical disturbance of the sediments. The recovery time of benthic communities following dredging activities is highly variable and dependent on a multitude of factors. Opportunistic, mobile, and stress-tolerant species may occur in high densities following disturbance, and areas with these types of species have been shown to be more resistant to dredging effects as compared to areas with sessile, long-living and sensitive species (Bonsdorff, 1980; Bemvenuiti *et al.*, 2005). Additionally, benthic communities have been shown to recover faster in areas with sufficient water exchange and steeper slopes as opposed to flat-bottom, sheltered areas (Van Dolah *et al.*, 1984; Kotta *et al.*, 2009; Szymelfenig *et al.*, 2006). Maintenance dredging and frequent physical disturbances have also been shown to slow benthic community recovery. Given the current velocities and tidal exchange observed during the field sampling, it is hypothesized that the benthic community will have a reasonably swift recovery assuming no recurrent physical disturbance. However, the increased ship traffic to this area will likely cause some recurrent physical disturbance and may slow the recovery process. Post-dredging monitoring consisting of several sampling events throughout the first year following completion of construction is recommended to assess the benthic community recovery process.

6.0 References

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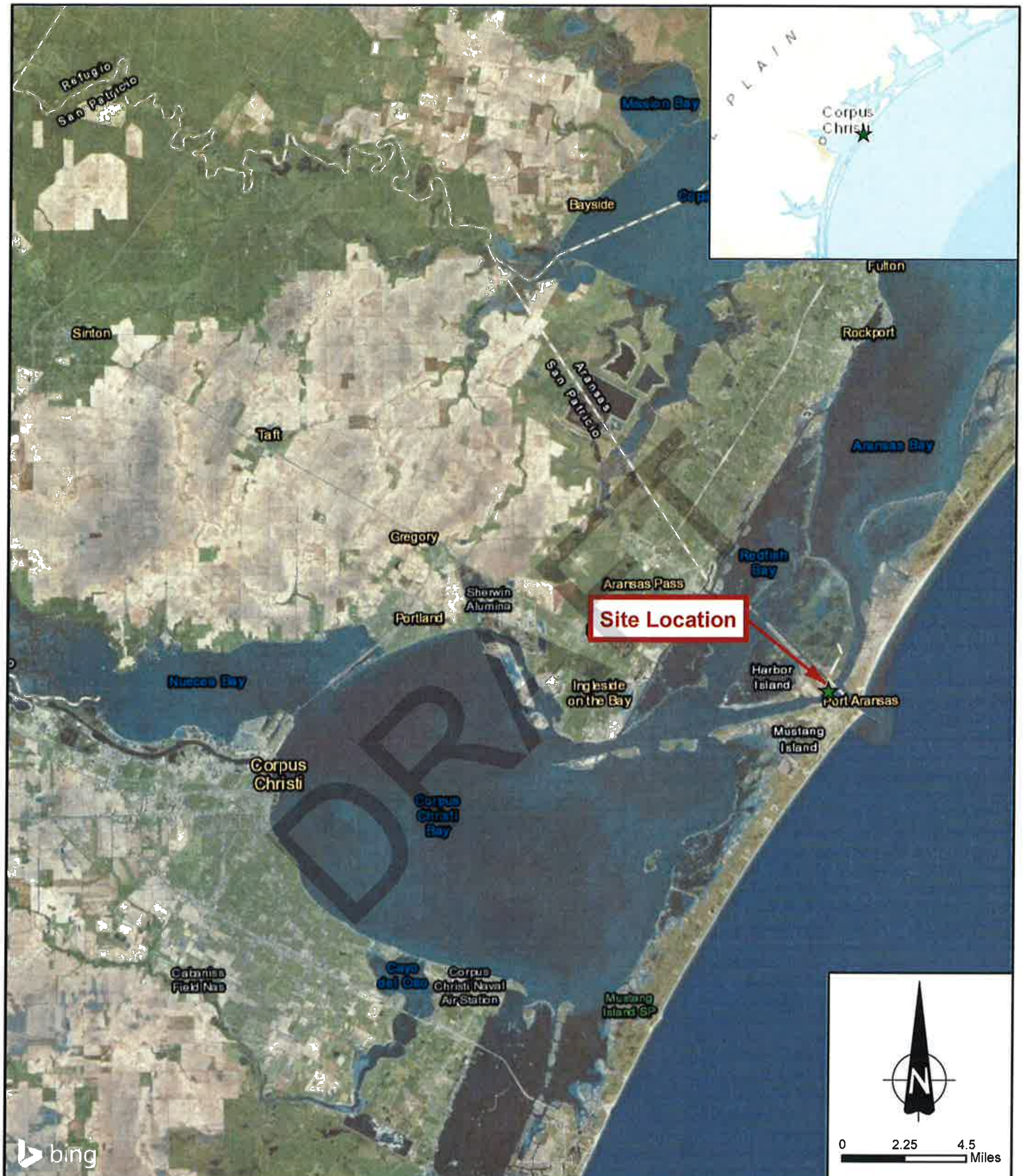
FIGURES



PCCA Harbor Island Permit Application Site Location	★ Site Location	DATE JUNE 2019
wood.		SCALE 1 " = 5 miles
		PROJECT NO. 6703180051
		FIGURE 1

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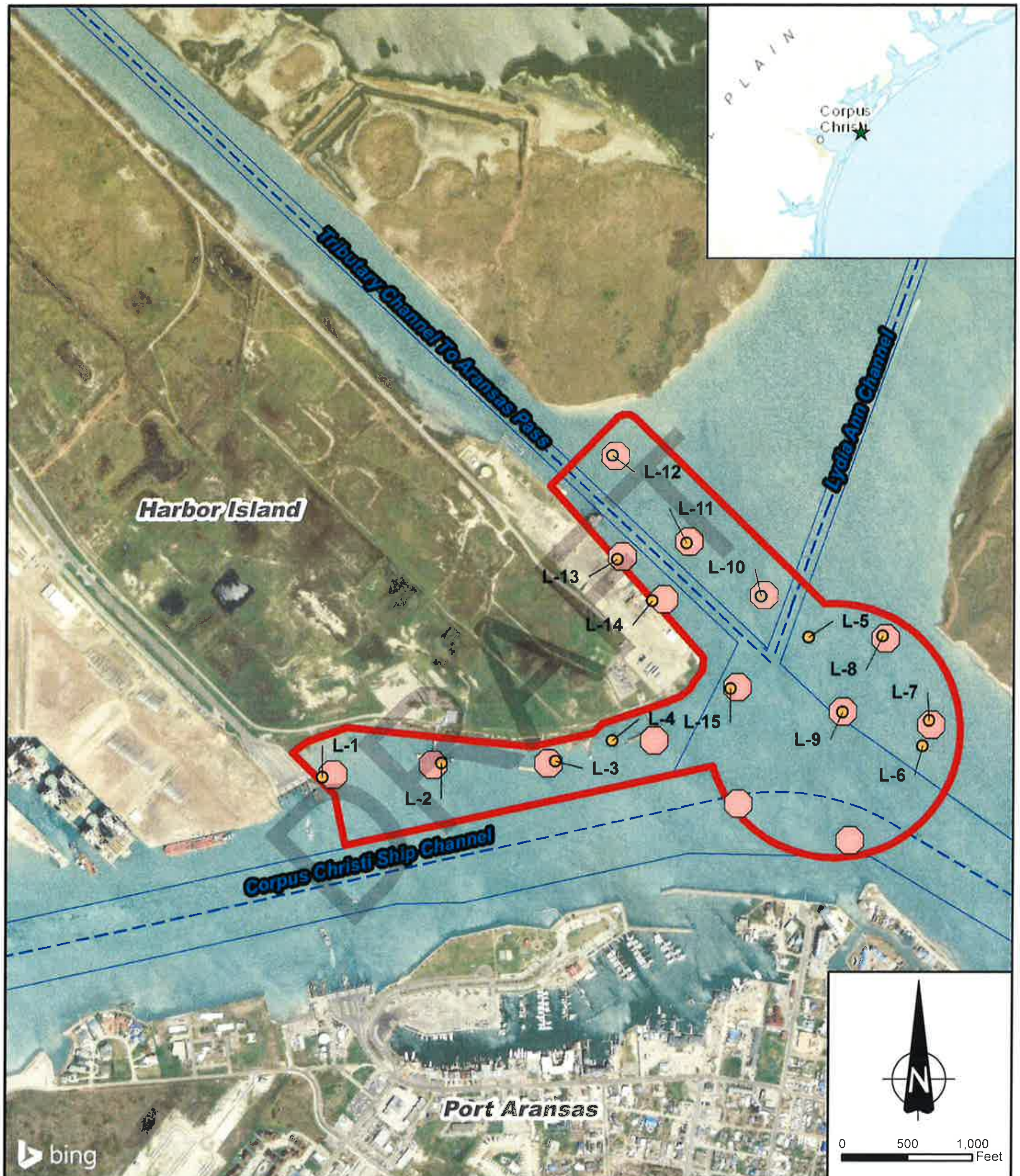
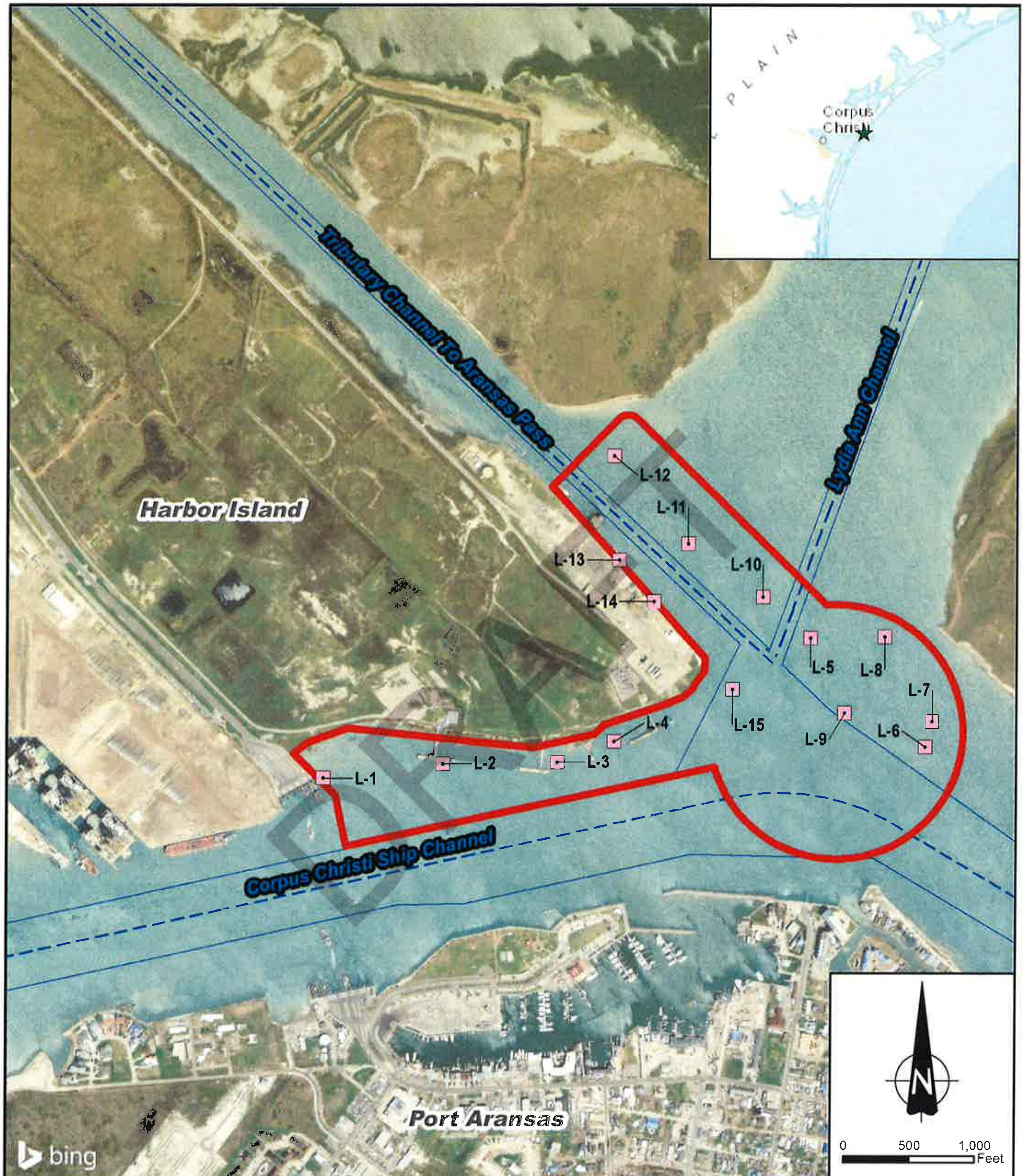


PCCA Harbor Island Permit Application Sample Locations	Actual Sample Locations	DATE JUNE 2019
PORT CORPUS CHRISTI	Proposed Sample Locations	SCALE 1 " = 1,000 feet
wood.	Project Boundary Toe of Channel	PROJECT NO. 6703180051
	Centerline of Channels Site Location	FIGURE 2

DRAWN BY: SB CHECKED BY: AB

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\Turnpike\03_EXHIBITS\2019_04_23_Figures\Figure 2 - Project Turnpike Sample Locations\2019_06_12\Sample_Locations.mxd - stacy.brooks - 6/12/2019 - 10:47:39 AM



PCCA Harbor Island Permit Application Sediment and Benthic Invertebrate Sample Locations	Benthic and Sediment Sample Locations	DATE JUNE 2019
PORT CORPUS CHRISTI	Project Boundary	SCALE 1 " = 1,000 feet
wood.	Toe of Channel	PROJECT NO. 6703180051
	Centerline of Channels	FIGURE 3
	Site Location	

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\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\Turnpike\03_EXHIBITS\2019_04_23_Figures\Figure 3 - Project Turnpike Sediment and Benthic Invertebrate Sample Locations\2019_06_12\Sediment_and_Benthic_Invertebrate_Sample_Locations.mxd - stacy.brooks - 6/12/2019 - 10:45:59 AM

PCCA Harbor Island Permit Application
Water Quality Sample Locations

PORT CORPUS CHRISTI

wood.

Legend	
○	Water Quality Measurement Locations
	Project Boundary
	Toe of Channel
	Centerline of Channels
★	Site Location

DATE	JUNE 2019
SCALE	1 " = 1,000 feet
PROJECT NO.	6703180051
FIGURE	4

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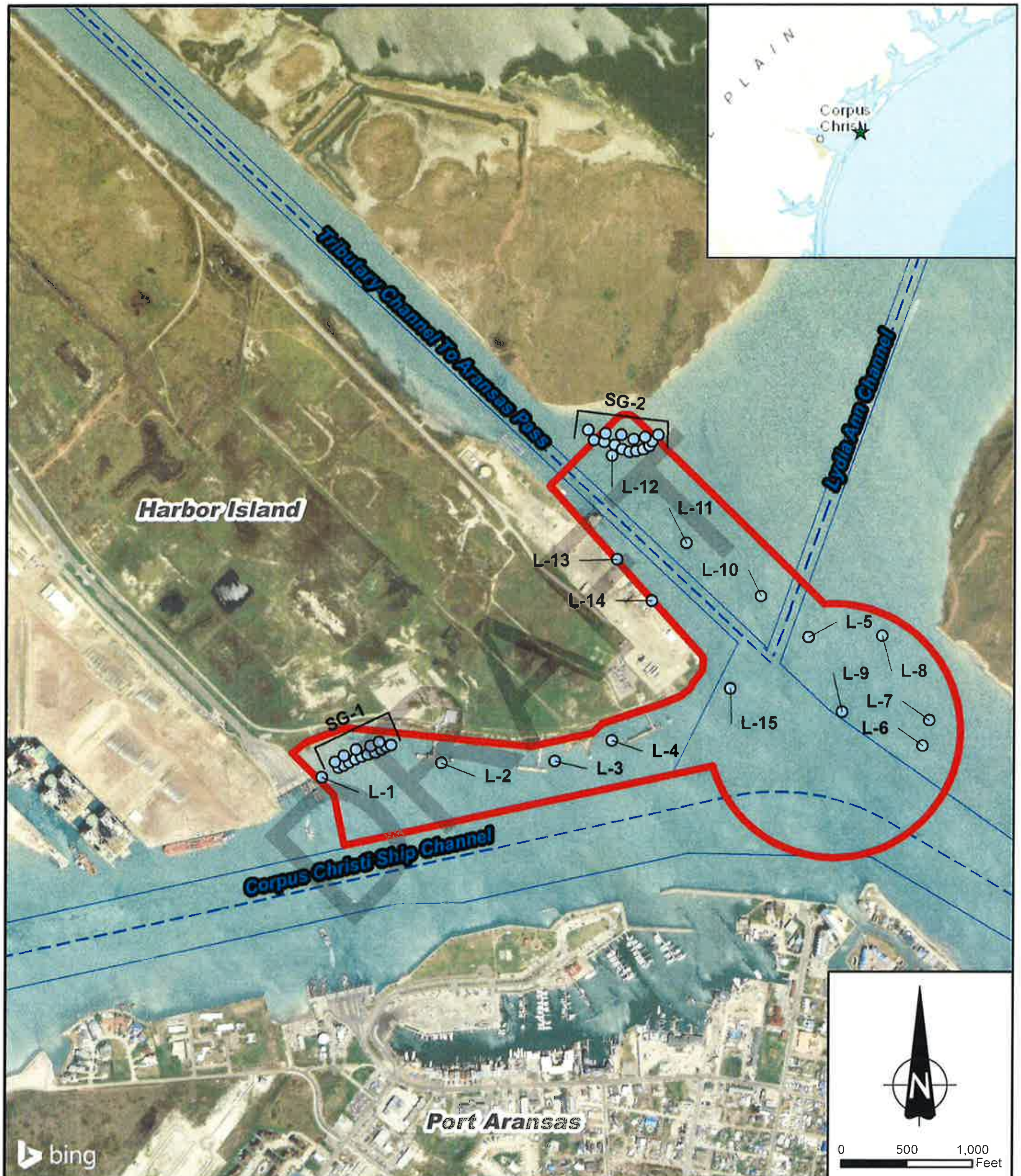
\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\Turnpike\03_EXHIBITS\2019_04_23_Figures\Figure 4 - Project Turnpike Water Quality Sample Locations\2019_06_12\Water_Quality_Sample_Locations.mxd - stacy.brooks - 6/12/2019 - 10:51:53 AM



PCCA Harbor Island Permit Application Seagrass Sample Locations	Sea Grass Sample Locations	DATE JUNE 2019
PORT CORPUS CHRISTI	Project Boundary	SCALE 1 " = 1,000 feet
wood.	Toe of Channel	PROJECT NO. 6703180051
	Centerline of Channels	FIGURE 5
	Site Location	

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\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\Turnpike\03_EXHIBITS\2019_04_23_Figures\Figure 5 - Project Turnpike Seagrass Sample Locations\2019_06_12\Seagrass_Sample_Locations_.mxd - stacy.brooks - 6/12/2019 - 10:53:21 AM

PCCA Harbor Island Permit Application
Marine Life and Plankton Sample Transects

PORT CORPUS CHRISTI

wood.

Legend	
Plankton Net Transect 1	
Plankton Net Transect 2	
Project Boundary	
Toe of Channel	
Centerline of Channels	
Site Location	

DATE JUNE 2019

SCALE 1 " = 1,000 feet

PROJECT NO. 6703180051

FIGURE 6

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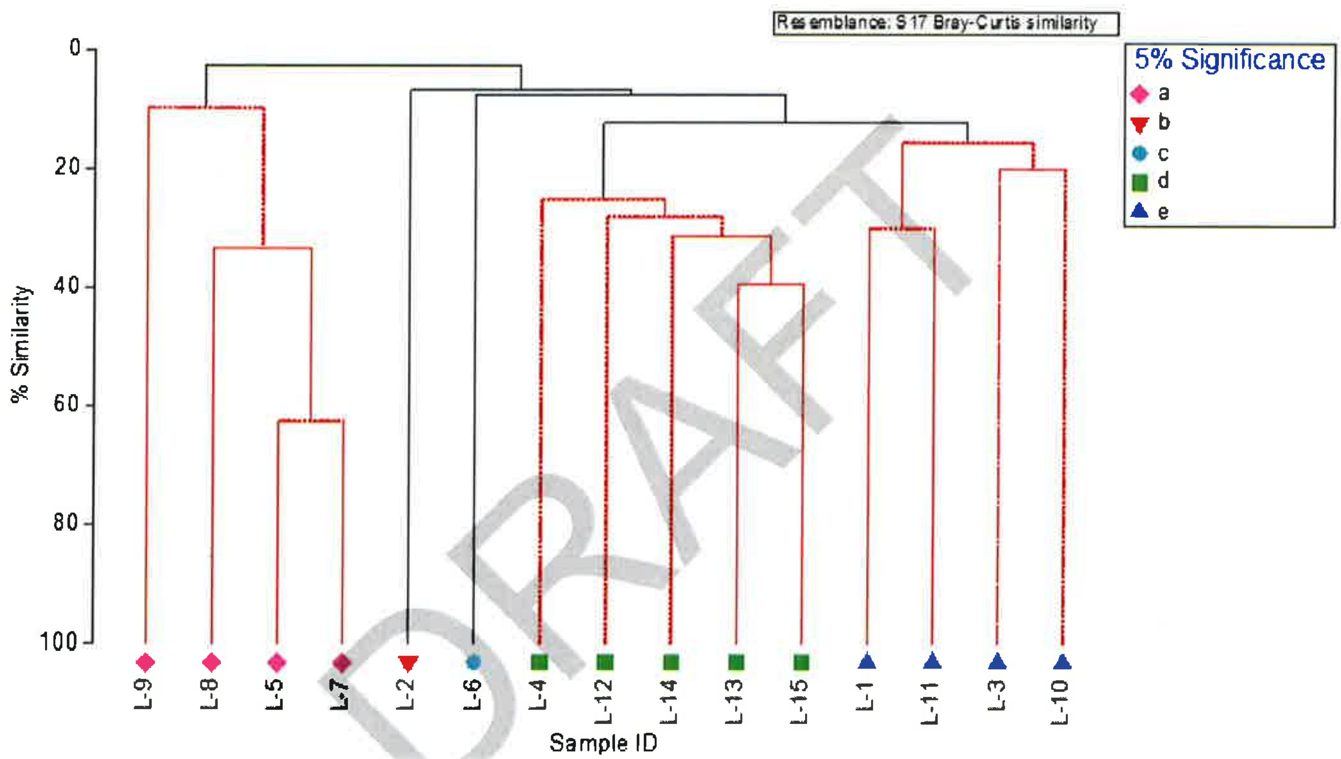
PCCA Harbor Island Permit Application Water Velocity Sample Locations	Water Velocity Measurement Locations	DATE JUNE 2019
PORT CORPUS CHRISTI	Project Boundary Toe of Channel	SCALE 1 " = 1,000 feet PROJECT NO. 6703180051
wood.	Centerline of Channels Site Location	FIGURE 7

DRAWN BY: SB CHECKED BY: AB

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\Turnpike\03_EXHIBITS\2019_04_23_Figures\Figure 7 - Project Turnpike Water Velocity Sample Locations\20190612\Water_Velocity_Sample_Locations.mxd - stacy.brooks - 6/12/2019 - 10:54:54 AM



PCCA Harbor Island Permit Application
Dendrogram Results from the CLUSTER Analysis of the Benthic Macroinvertebrate Samples

PORT CORPUS CHRISTI

wood.

Dendrogram results from the CLUSTER analysis of the benthic macroinvertebrate samples. Solid black lines indicated significant differences at $p < 0.05$, while red dotted lines indicated insignificant differences with $p > 0.05$. The SIMPROF option was used to create a factor illustrating which sample groups were significantly different from others (listed in the key above) at the 5% significance level.

DATE	JUNE 2019
SCALE	N/A
PROJECT NO.	6703180051
FIGURE	8

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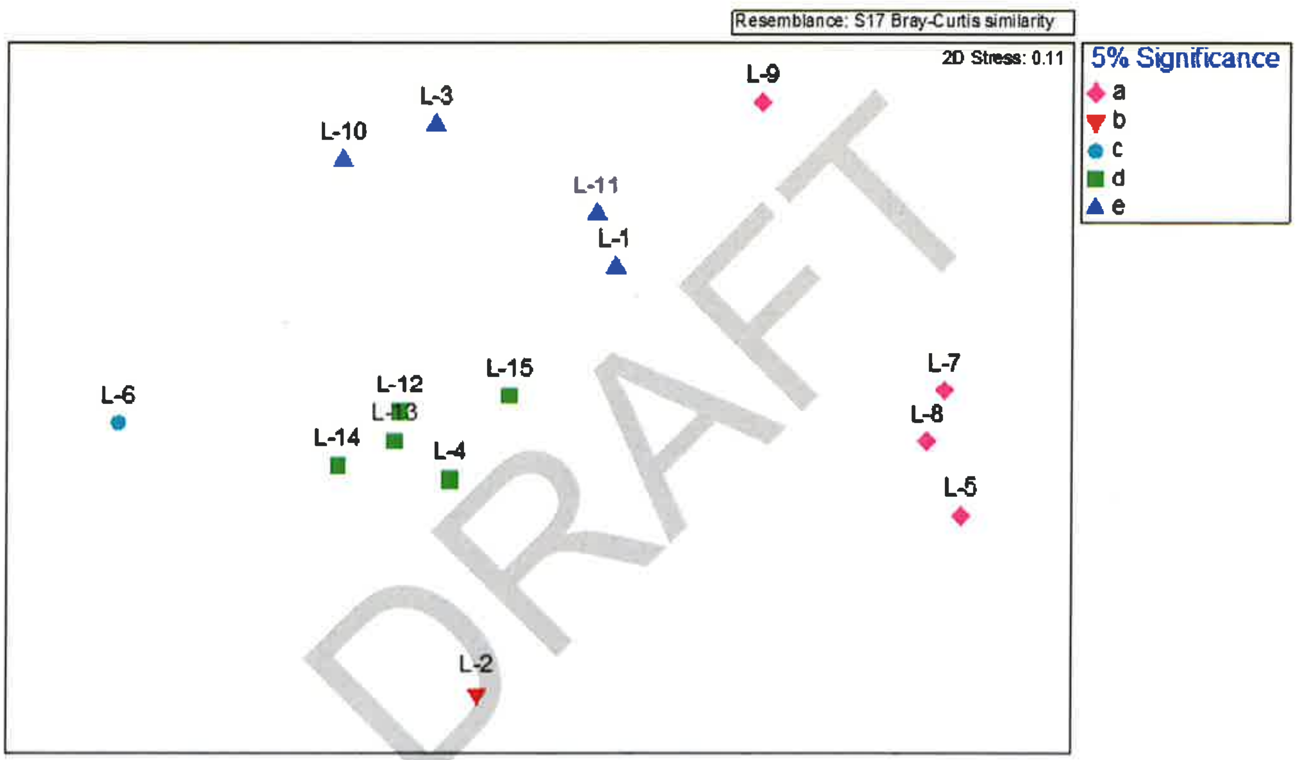
\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\Turnpike\03_EXHIBITS\2019_04_23_Figures\Figure 8 - Dendrogram Results from the CLUSTER Analysis of the Benthic Macroinvertebrate Samples\20190612\Dendrogram_Cluster_Analysis_Macro.mxd - stacy.brooks - 6/12/2019 - 10:56:18 AM



PCCA Harbor Island Permit Application
Two-Dimensional nMDS

PORT CORPUS CHRISTI®

wood.

Two-dimensional nMDS plot of benthic macroinvertebrate samples with the 5% significance level as a factor.

DATE	JUNE 2019
SCALE	N/A
PROJECT NO.	6703180051
FIGURE	9

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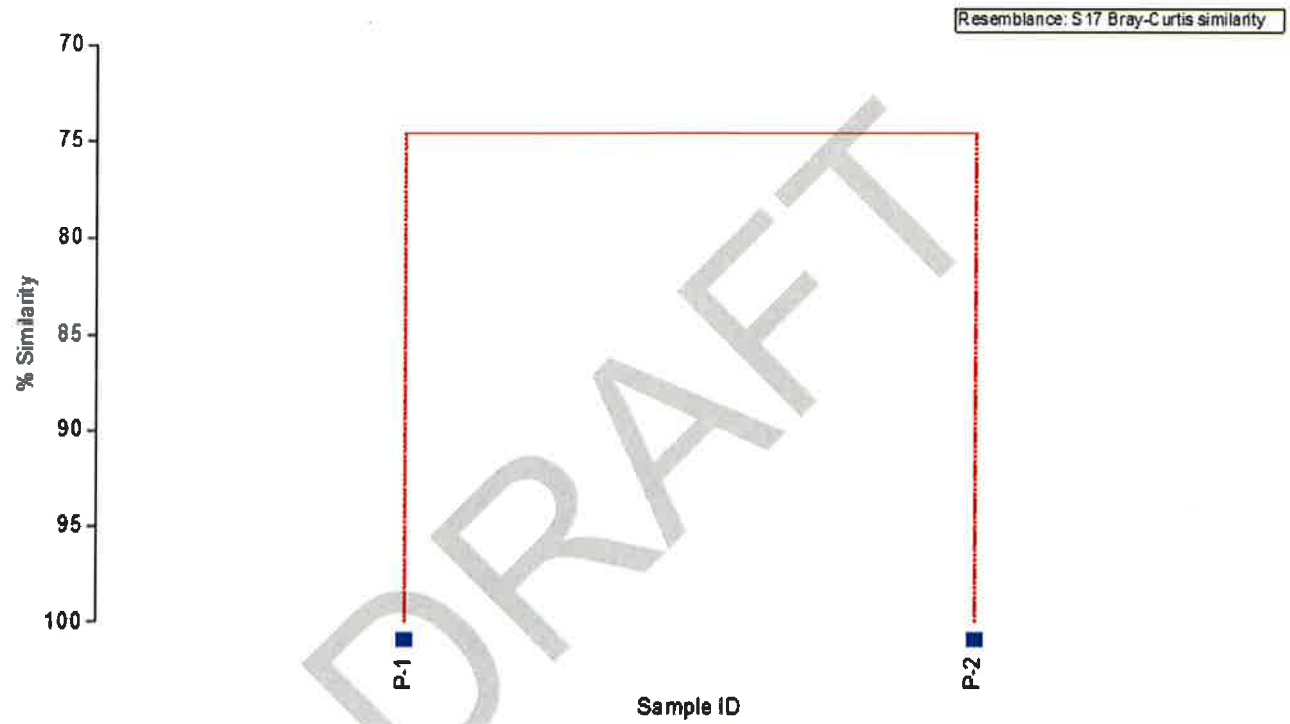
\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\Turnpike\03_EXHIBITS\2019_04_23_Figures\Figure 9 - Two Dimensional nMDS\20190612\Two_Dimensional_nMDS_P.mxd - stacy.brooks - 6/12/2019 - 10:57:46 AM



PCCA Harbor Island Permit Application
Dendrogram Results from the CLUSTER Analysis with the SIMPROF Option of the Plankton Samples

PORT CORPUS CHRISTI®

wood.

Dendrogram results from the CLUSTER analysis with the SIMPROF option of the plankton samples. Solid black lines indicated significant differences at $p < 0.05$, while red dotted lines indicated insignificant differences with $p > 0.05$.

DATE	JUNE 2019
SCALE	N/A
PROJECT NO.	6703180051
FIGURE	10

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TABLES

TABLE 1
SUMMARY OF SAMPLE COLLECTION SITES AND ANALYSES
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Location	GPS Coordinates (Proposed)		GPS Coordinates (Actual)	
	North	West	North	West
L-1	27.844318	-97.069441	27.84427	-97.06970
L-2	27.844493	-97.067105	27.84454	-97.06691
L-3	27.844501	-97.064404	27.84455	-97.06424
L-4	27.844950	-97.061924	27.84496	-97.06291
L-5	27.843608	-97.059952	27.84707	-97.05827
L-6[a]	27.842822	-97.057325	27.84478	-97.05560
L-7	27.845212	-97.055378	27.84531	-97.05544
L-8	27.847017	-97.056448	27.84708	-97.05653
L-9	27.845511	-97.057463	27.84550	-97.05749
L-10	27.847944	-97.059301	27.84793	-97.05938
L-11	27.849084	-97.061056	27.84906	-97.06112
L-12	27.850885	-97.062762	27.85090	-97.06284
L-13	27.848790	-97.062619	27.84874	-97.06274
L-14	27.847891	-97.061656	27.84787	-97.06194
L-15	27.846039	-97.059951	27.84602	-97.06012

FOOTNOTES:

[a]Unable to collect sediment sample from L-6: there were 14 ponar drops (4 on port side, 10 on starboard side) which only yielded shell hash.

TABLE 2
SEDIMENT SAMPLING PARAMETERS
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Location	Date	Time	Depth to Sediment (ft)	Top of Sediment Elevation MLLW (ft)	Description	GPS Coordinates (Actual)	
						North	West
L-1	02/04/19	1155	3.3	-2.47	dark gray silty mud	27.84427	-97.06970
L-2	02/05/19	1015	22.3	-21.60	dark gray, sand and mud, 1 strand of seagrass	27.84454	-97.06691
L-3	02/05/19	1055	13.4	-12.71	dark gray, clay, sandy, shell hash	27.84455	-97.06424
L-4	02/05/19	1515	28.5	-27.28	dark gray, clayey sand, some shell	27.84496	-97.06291
L-5	02/05/19	1620	20.9	-19.40	gray, fine-grained sand	27.84707	-97.05827
L-6[a]	02/06/19	1538	35.8	-34.27	--	27.84478	-97.05560
L-7	02/04/19	1530	16.3	-14.72	gray sand and mud	27.84531	-97.05544
L-8	02/04/19	1440	16.8	-15.54	gray sand and mud	27.84708	-97.05653
L-9	02/06/19	1505	44.9	-43.49	brownish gray sand and mud	27.84550	-97.05749
L-10	02/06/19	1407	34.8	-33.51	brownish gray, fine-grained sand with clay	27.84793	-97.05938
L-11	02/05/19	1400	25.5	-24.3	gray sand with clay	27.84906	-97.06112
L-12	02/04/19	1325	6.9	-5.74	dark gray sandy mud	27.85090	-97.06284
L-13	02/05/19	1251	28.0	-26.99	dark gray, sand and mud, shell hash	27.84874	-97.06274
L-14	02/05/19	1200	27.5	-26.71	dark gray, sand and mud, some shell hash, 1 strand of seagrass	27.84787	-97.06194
L-15	02/06/19	1305	53.5	-52.48	dark gray, muddy sand	27.84602	-97.06012

FOOTNOTES:

[a]Unable to collect sediment sample from L-6: there were 14 ponar drops (4 on port side, 10 on starboard side) which only yielded shell hash.

TABLE 3
SEDIMENT ANALYTICAL DATA
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Location	Date	Total Organic Carbon (weight%-dry)	Grain Size Analysis							
			% $\geq$3″	% Gravel		% Sand			% Fines	
				Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
L-1	02/04/19	0.0630	0.0	0.0	0.0	0.0	0.5	89.1	7.9	2.5
L-2	02/05/19	0.475	0.0	0.0	0.0	0.0	0.1	63.4	20.2	16.3
L-3	02/05/19	0.407	0.0	0.0	0.0	0.0	5.1	74.3	9.8	10.8
L-4	02/05/19	0.319	0.0	0.0	31.1	8.9	1.7	31.2	15.2	11.9
L-5	02/05/19	<0.0600	0.0	0.0	0.0	0.0	0.1	95.9	2.0	2.0
L-6[a]	02/06/19	--	--	--	--	--	--	--	--	--
L-7	02/04/19	<0.0600	0.0	0.0	0.0	0.0	0.4	95.0	3.1	1.5
L-8	02/04/19	<0.0600	0.0	0.0	0.0	0.0	0.2	95.6	2.7	1.5
L-9	02/06/19	<0.0600	0.0	0.0	0.0	0.0	0.6	92.7	4.2	2.5
L-10	02/06/19	0.0670	0.0	0.0	0.0	0.0	0.3	91.8	5.9	2.0
L-11	02/05/19	0.515	0.0	0.0	0.0	0.0	3.9	89.6	3.0	3.5
L-12	02/04/19	0.161	0.0	1.2	19.9	0.0	3.6	66.8	5.3	3.2
L-13	02/05/19	0.494	0.0	0.0	59.6	0.0	6.8	28.7	2.1	2.8
L-14	02/05/19	0.264	0.0	0.0	0.0	0.0	3.2	78.6	7.3	10.9
L-15	02/06/19	<0.0600	0.0	0.0	0.0	0.0	0.1	43.4	53.1	3.4

Footnotes:

[a]Unable to collect sediment sample from L-6: there were 14 ponar drops (4 on port side, 10 on starboard side) which only yielded shell hash.

TABLE 4
BENTHIC AND PLANKTON SAMPLE DIVERSITY PARAMETERS
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Sample Type	Sample ID	Date	Total # of Taxa (S)	Total # of Individuals per Unit Area* (N)	Margalef's Richness (d)	Pielow's Evenness (J')	Shannon's Diversity ($H'(log_e)$)	Simpson's Diversity (1-λ')
Benthic	L-1	02/04/19	11	775.00	3.46	0.91	2.18	0.91
	L-2	02/05/19	59	31172.28	8.81	0.59	2.41	0.80
	L-3	02/05/19	11	516.67	4.02	0.99	2.37	0.98
	L-4	02/05/19	30	2798.62	6.95	0.89	3.04	0.94
	L-5	02/05/19	5	344.45	1.92	0.86	1.39	0.79
	L-6	02/06/19	51	9601.41	9.25	0.74	2.91	0.86
	L-7	02/04/19	3	344.45	0.96	0.67	0.74	0.46
	L-8	02/04/19	4	301.39	1.54	0.92	1.28	0.81
	L-9	02/06/19	5	258.33	2.23	0.97	1.56	0.93
	L-10	02/06/19	21	1205.56	6.00	0.96	2.92	0.97
	L-11	02/05/19	11	947.22	3.24	0.91	2.17	0.90
	L-12	02/04/19	55	4650.01	11.53	0.91	3.63	0.97
	L-13	02/05/19	28	3745.84	6.05	0.88	2.92	0.94
	L-14	02/05/19	37	6329.18	7.21	0.69	2.51	0.85
	L-15	02/06/19	30	2583.34	7.08	0.91	3.08	0.95
Plankton	P-1	02/06/19	30	228.43	2.96	0.38	1.29	0.46
	P-2	02/06/19	24	186.78	2.46	0.51	1.61	0.61

* Unit area is per square meter and per cubic meter for benthic and plankton samples, respectively.

TABLE 5
WATER QUALITY PARAMETERS
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Location	Date	Depth to Sediment	Time	Depth of Sample (ft. below water surface)	Elevation (MLLW)[a]	Water Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	GPS Coordinates (Actual)		Section of Project Area
									North	West	
L-1	02/04/19	3.3	1614	2.8	-1.97	16.62	23.81	4.92	27.84432	-97.06974	Corpus Christi Ship Channel
L-2	02/05/19	22.3	1001	5.0	-4.30	15.67	21.28	6.27	27.84454	-97.06691	Corpus Christi Ship Channel
			1004	10.0	-9.30	15.64	21.28	7.79			
			1007	15.0	-14.30	15.68	21.29	7.68			
			1010	20.0	-19.30	15.81	21.36	7.65			
L-3	02/05/19	13.4	1045	5.0	-4.31	16.41	19.96	5.78	27.84455	-97.06424	Corpus Christi Ship Channel
			1048	10.0	-9.31	16.03	21.41	6.26			
L-4	02/05/19	28.5	1458	5.0	-3.78	16.94	17.02	5.78	27.84496	-97.06291	Corpus Christi Ship Channel
			1501	10.0	-8.78	16.71	18.02	5.73			
			1504	15.0	-13.78	16.69	18.28	5.72			
			1507	20.0	-18.78	16.61	19.08	4.65			
			1510	25.0	-23.78	16.29	21.59	4.61			
L-5	02/05/19	20.9	1603	5.0	-3.50	16.47	18.38	5.92	27.84707	-97.05827	Turning Basin
			1606	10.0	-8.50	16.11	20.74	5.87			
			1609	15.0	-13.50	16.04	20.98	5.86			
			1612	20.0	-18.50	16.09	21.10	6.20			
L-6	02/06/19	35.8	1542	5.0	-3.47	16.87	16.22	6.20	27.84478	-97.05560	Turning Basin
			1545	10.0	-8.47	16.82	16.42	5.89			
			1548	15.0	-13.47	16.81	16.80	6.19			
			1551	20.0	-18.47	16.76	17.41	5.83			
			1554	25.0	-23.47	16.75	17.51	5.95			
			1557	30.0	-28.47	16.76	17.45	5.82			
L-7	02/04/19	16.3	1514	5.0	-3.42	16.05	22.48	4.29	27.84531	-97.05544	Turning Basin
			1517	10.0	-8.42	15.91	24.67	4.25			
			1520	15.0	-13.42	15.87	25.07	4.57			
L-8	02/04/19	16.8	1422	5.0	-3.74	16.01	20.63	6.16	27.84708	-97.05653	Turning Basin
			1426	10.0	-8.74	15.94	21.99	6.15			
			1430	15.0	-13.74	15.96	23.25	6.08			

TABLE 5
WATER QUALITY PARAMETERS
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Location	Date	Depth to Sediment	Time	Depth of Sample (ft. below water surface)	Elevation (MLLW)[a]	Water Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	GPS Coordinates (Actual)		Section of Project Area
									North	West	
L-9	02/06/19	44.9	1441	5.0	-3.59	16.76	15.52	6.31	27.84550	-97.05749	Turning Basin
			1444	10.0	-8.59	16.76	16.25	5.96			
			1447	15.0	-13.59	16.71	17.42	6.19			
			1450	20.0	-18.59	16.78	17.57	6.17			
			1453	25.0	-23.59	16.86	17.68	6.01			
			1456	30.0	-28.59	16.76	17.92	6.19			
			1459	35.0	-33.59	16.73	17.95	5.90			
			1502	40.0	-38.59	16.72	17.96	5.93			
L-10	02/06/19	34.8	1351	5.0	-3.71	16.91	15.37	6.02	27.84793	-97.05938	Tributary Channel to Aransas Pass
			1354	10.0	-8.71	16.90	15.32	6.06			
			1357	15.0	-13.71	16.81	15.33	5.98			
			1400	20.0	-18.71	16.79	15.46	6.31			
			1403	25.0	-23.71	16.77	16.46	6.06			
			1406	30.0	-28.71	16.68	17.29	5.84			
L-11	02/05/19	25.5	1347	5.0	-3.80	16.13	15.78	6.21	27.84906	-97.06112	Tributary Channel to Aransas Pass
			1350	10.0	-8.80	16.62	16.17	5.78			
			1353	15.0	-13.80	16.72	16.22	6.11			
			1356	20.0	-18.80	17.06	17.59	5.62			
			1359	25.0	-23.80	16.12	19.19	5.68			
L-12	02/04/19	6.9	1350	5.0	-3.84	16.26	20.32	4.64	27.85090	-97.06284	Tributary Channel to Aransas Pass
L-13	02/05/19	28.0	1221	5.0	-3.99	17.02	16.51	6.12	27.84874	-97.06274	Tributary Channel to Aransas Pass
			1224	10.0	-8.99	17.62	17.67	7.01			
			1227	15.0	-13.99	17.73	17.84	6.99			
			1230	20.0	-18.99	17.78	17.92	6.99			
			1232	25.0	-23.99	17.82	17.97	7.09			

TABLE 5
WATER QUALITY PARAMETERS
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Location	Date	Depth to Sediment	Time	Depth of Sample (ft. below water surface)	Elevation (MLLW)[a]	Water Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	GPS Coordinates (Actual)		Section of Project Area
									North	West	
L-14	02/05/19	27.5	1141	5.0	-4.21	16.92	16.73	6.99	27.84787	-97.06194	Tributary Channel to Aransas Pass
			1144	10.0	-9.21	16.92	16.73	6.18			
			1147	15.0	-14.21	17.19	17.18	6.79			
			1150	20.0	-19.21	17.75	18.04	7.05			
			1153	25.0	-24.21	17.75	18.06	7.04			
L-15	02/06/19	53.5	1246	5.0	-3.98	17.62	15.71	7.30	27.84602	-97.06012	Turning Basin
			1249	10.0	-8.98	17.34	15.79	6.83			
			1252	15.0	-13.98	17.04	16.00	6.89			
			1255	20.0	-18.98	16.83	16.57	6.94			
			1258	25.0	-23.98	16.70	16.69	6.56			
			1321 (a)	30.0	-28.98	16.66	17.21	6.15			
			1324	35.0	-33.98	16.63	17.63	6.28			
			1327	40.0	-38.98	16.60	17.78	6.01			
			1330	45.0	-43.98	16.60	18.04	6.30			
			1333	50.0	-48.98	16.62	18.06	6.19			

FOOTNOTES:

[a]MLLW calculated using water level data from NOAA Tides and Currents Website; Port Aransas, Texas, Station ID: 8775237

TABLE 6
SEAGRASS/OYSTER ASSESSMENT
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

SG-1 Location	GPS Coordinates (Actual)		Date	Time	Seagrass Present	Genus Description	Oysters Present
	North	West					
1-1	27.8444638	-97.0692948	02/07/19	1319	Absent	--	Absent
1-2	27.8445089	-97.0691706	02/07/19	1321	Absent	--	Absent
1-3	27.8445728	-97.0690468	02/07/19	1322	Absent	--	Absent
1-4	27.8446371	-97.0689096	02/07/19	1323	Absent	--	Absent
1-5	27.8446882	-97.0687655	02/07/19	1323	Absent	--	Absent
1-6	27.8447276	-97.0686111	02/07/19	1324	Absent	--	Absent
1-7	27.8447654	-97.0684378	02/07/19	1325	Absent	--	Absent
1-8	27.8448309	-97.0683039	02/07/19	1326	Absent	--	Absent
1-9	27.8448833	-97.0681927	02/07/19	1327	Absent	--	Absent
1-10	27.8449196	-97.0680758	02/07/19	1329	Absent	--	Absent
1-11	27.8445801	-97.0693803	02/07/19	1330	Absent	--	Absent
1-12	27.8447131	-97.0691747	02/07/19	1331	Absent	--	Absent
1-13	27.8448311	-97.0688794	02/07/19	1332	Absent	--	Absent
1-14	27.8449061	-97.0685487	02/07/19	1333	Absent	--	Absent
1-15	27.8449831	-97.0683574	02/07/19	1334	Absent	--	Absent

SG-2 Location	GPS Coordinates (Actual)		Time	Time	Seagrass Present	Genus Description	Oysters Present
	N	W					
2-1	27.8512259	-97.0632498	02/07/19	1350	Slight Presense	2 strands of Halodule	Absent
2-2	27.8511793	-97.0630166	02/07/19	1351	Absent	--	Absent
2-3	27.8511198	-97.0627718	02/07/19	1352	Absent	--	Absent
2-4	27.8510258	-97.0625961	02/07/19	1354	Absent	--	Absent
2-5	27.8509690	-97.0624241	02/07/19	1355	Absent	--	Absent
2-6	27.8509815	-97.0622654	02/07/19	1356	Absent	--	Absent
2-7	27.8510183	-97.0620960	02/07/19	1357	Absent	--	Absent
2-8	27.8510912	-97.0619529	02/07/19	1358	Absent	--	Absent
2-9	27.8511843	-97.0618898	02/07/19	1359	Absent	--	Absent
2-10	27.8513152	-97.0617466	02/07/19	1400	Absent	--	Absent
2-11	27.8512723	-97.0620545	02/07/19	1402	Absent	--	Absent
2-12	27.8512344	-97.0623265	02/07/19	1403	Absent	--	Absent
2-13	27.8513289	-97.0626104	02/07/19	1405	Absent	--	Absent
2-14	27.8513605	-97.0629851	02/07/19	1406	Absent	--	Absent
2-15	27.8514359	-97.0633794	02/07/19	1408	Absent	--	Absent

Original Locations	GPS Coordinates (Actual)		Date	Time	Seagrass Present	Genus Description	Oysters Present
	N	W					
L-1	27.84427	-97.06970	02/04/19	1155	Absent	--	Absent
L-2	27.84454	-97.06691	02/05/19	1015	Slight Presense	1 strand of Halodule	Absent
L-3	27.84455	-97.06424	02/05/19	1055	Absent	--	Absent
L-4	27.84496	-97.06291	02/05/19	1515	Absent	--	Absent
L-5	27.84707	-97.05827	02/05/19	1620	Absent	--	Absent
L-6	27.84478	-97.05560	02/06/19	1600	Absent	--	Absent
L-7	27.84531	-97.05544	02/04/19	1530	Absent	--	Absent
L-8	27.84708	-97.05653	02/04/19	1440	Absent	--	Absent
L-9	27.84550	-97.05749	02/06/19	1505	Absent	--	Absent
L-10	27.84793	-97.05938	02/06/19	1407	Absent	--	Absent
L-11	27.84906	-97.06112	02/05/19	1400	Absent	--	Absent
L-12	27.85090	-97.06284	02/04/19	1325	Absent	--	Absent
L-13	27.84874	-97.06274	02/05/19	1251	Absent	--	Absent
L-14	27.84787	-97.06194	02/05/19	1200	Slight Presense	1 strand of Halodule	Absent
L-15	27.84602	-97.06012	02/06/19	1305	Absent	--	Absent

TABLE 7
VELOCITY MEASUREMENTS
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Sample Point	Date	Start/End Time	Depth (ft. below water surface)	Velocity (m/s)	Direction (°)	Ebb/Flood	GPS Coordinates (Actual)		Section of Project Area
							North	West	
S-1	2/7/2019	1413	5	0.256	102.3	Ebb	27.85055	-97.06259	Tributary Channel To Aransas Pass
S-2	2/7/2019	1417	5	0.736	301.7	Flood	27.84885	-97.06048	Tributary Channel To Aransas Pass
			10	0.493	314.5				
			15	0.518	327.2				
			20	0.372	325.2				
		1418	25	0.581	324.5				
S-3	2/11/2019	837	5	0.321	18.6	Ebb	27.84935	-97.06102	Tributary Channel To Aransas Pass
			10	0.465	14.3				
			15	0.391	26.3				
		838	20	0.330	27.2				
S-4	2/7/2019	1122	5	0.199	338.4	Ebb	27.84402	-97.06834	Corpus Christi Ship Channel
		1123	10	0.265	114.7				
S-5	2/7/2019	1129	5	0.537	62.2	Ebb	27.84397	-97.06768	Corpus Christi Ship Channel
			10	0.414	62.2				
			15	0.385	62.7				
			20	0.384	60.2				
			25	0.483	66.9				
			30	0.455	46.5				
		1130	35	0.307	74.0				
S-6	2/11/2019	932	5	0.037	33.6	Flood	27.84393	-97.06789	Corpus Christi Ship Channel
			10	0.421	152.5				
			15	0.181	209.1				
		934	20	0.112	246.1				
S-7	2/7/2019	1142	5	0.432	83.8	Ebb	27.84407	-97.06578	Corpus Christi Ship Channel
			10	0.361	68.4				
			15	0.259	58.2				
			20	0.167	91.2				
			25	0.249	82.5				
			30	0.370	56.1				
			35	0.390	52.0				
			40	0.346	60.3				
		1144	45	0.207	86.6				
S-8	2/11/2019	1058	5	0.140	57.1	Flood	27.84409	-97.06571	Corpus Christi Ship Channel
			10	0.128	52.8				
			15	0.057	32.8				
			20	0.095	347.6				
			25	0.077	291.0				
			30	0.097	284.4				
			35	0.077	255.3				
			40	0.143	250.4				
		1101	45	0.157	249.7				
S-9	2/7/2019	1158	5	0.231	233.4	Ebb	27.84475	-97.06200	Corpus Christi Ship Channel
			10	0.261	246.6				
			15	0.166	203.0				
			20	0.246	273.3				
			25	0.071	155.2				
			30	0.048	141.2				
			35	0.140	150.8				
			40	0.272	71.9				
			45	0.454	102.0				
			50	0.284	47.7				
		1202	55	0.421	62.8				
S-10	2/11/2019	944	5	0.149	165.5	Flood	27.84470	-97.06207	Corpus Christi Ship Channel
			10	0.299	173.0				
			15	0.147	193.4				
			20	0.172	170.2				
			25	0.203	161.3				
			30	0.158	185.1				
			35	0.158	208.2				
			40	0.115	217.7				
			45	0.139	258.2				
			50	0.106	240.4				
		948	55	0.118	254.4				
S-11	2/11/2019	850	5	0.151	130.0	Ebb	27.84791	-97.05933	Tributary Channel To Aransas Pass
			10	0.117	14.3				
			15	0.196	17.2				
			20	0.126	34.1				
			25	0.066	17.6				
		852	30	0.126	351.2				
S-12	2/11/2019	1039	5	0.041	221.3	Flood	27.84794	-97.05929	Tributary Channel To Aransas Pass
			10	0.110	333.0				
			15	0.106	358.1				
			20	0.187	9.9				
		1041	25	0.123	16.2				
S-13	2/11/2019	911	5	0.128	352.6	Flood	27.84554	-97.05748	Turning Basin
			10	0.260	26.6				
			15	0.298	40.9				
			20	0.267	32.6				
			25	0.108	25.7				
			30	0.163	145.4				
			35	0.132	234.0				
			40	0.158	281.4				
		914	45	0.217	9.5				

TABLE 7
VELOCITY MEASUREMENTS
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Sample Point	Date	Start/End Time	Depth (ft. below water surface)	Velocity (m/s)	Direction (°)	Ebb/Flood	GPS Coordinates (Actual)		Section of Project Area
							North	West	
S-14	2/11/2019	1956	5	0.110	128.1	Ebb	27.84550	-97.05750	Turning Basin
			10	0.080	28.9				
			15	0.070	22.2				
			20	0.277	18.4				
			25	0.072	14.5				
			30	0.360	22.9				
			35	0.049	61.4				
			40	0.103	42.5				
		1959	45	0.164	10.0				
S-15	2/11/2019	956	5	0.050	214.4	Flood	27.84837	-97.06187	Tributary Channel To Aransas Pass
			10	0.127	234.9				
			15	0.123	223.1				
		957	20	0.169	223.3				
S-16	2/11/2019	1949	5	0.332	345.8	Ebb	27.84826	-97.06189	Tributary Channel To Aransas Pass
			10	0.087	19.1				
			15	0.055	71.7				
		1951	20	0.050	68.6				
S-17	2/11/2019	1008	5	0.173	284.9	Flood	27.84523	-97.05539	Turning Basin
		1009	10	0.070	304.8				
S-18	2/11/2019	2003	5	0.085	181.6	Ebb	27.84516	-97.05539	Turning Basin
			10	0.155	57.6				
		2004	15	0.288	63.8				
S-19	2/11/2019	1018	5	0.131	357.7	Flood	27.84271	-97.05746	Turning Basin
			10	0.076	354.8				
			15	0.105	339.0				
			20	0.108	318.9				
			25	0.074	354.4				
			30	0.102	340.1				
			35	0.196	290.9				
			40	0.134	313.8				
			45	0.207	299.9				
			50	0.216	299.6				
		1022	55	0.114	260.8				
S-20	2/11/2019	2016	5	0.113	281.4	Ebb	27.84254	-97.05746	Turning Basin
			10	0.384	49.5				
			15	0.540	52.8				
			20	0.365	47.8				
			25	0.275	51.0				
			30	0.421	50.1				
			35	0.245	26.8				
			40	0.195	21.4				
		2018	45	0.151	36.5				
S-21	2/11/2019	1026	5	0.082	246.1	Flood	27.84367	-97.05992	Turning Basin
			10	0.050	248.0				
			15	0.141	270.4				
			20	0.152	231.5				
			25	0.155	226.7				
			30	0.057	211.3				
			35	0.127	192.8				
			40	0.236	346.7				
			45	0.182	349.4				
			50	0.158	14.5				
		1031	55	0.039	58.8				
S-22	2/11/2019	2022	5	0.667	77.7	Ebb	27.84308	-97.06057	Turning Basin
			10	0.590	70.7				
			15	0.677	59.3				
			20	0.637	59.9				
			25	0.439	56.6				
			30	0.446	69.2				
			35	0.514	74.0				
			40	0.465	46.0				
		2024	45	0.289	35.7				
S-23	2/11/2019	1047	5	0.456	10.9	Flood	27.84710	-97.05650	Turning Basin
		1047	10	0.367	21.2				
S-24	2/11/2019	2009	5	0.065	140.3	Ebb	27.84707	-97.05651	Turning Basin
		2010	10	0.226	79.3				

ATTACHMENTS

ATTACHMENT 1

PHOTOGRAPHS

PHOTO 1:

Wood personnel calibrating water quality meter.

PHOTO 2:

Wood preparing saline solution used to relax benthic invertebrates prior to fixation and preservation.

PHOTO 3:

Naismith personnel prepare petite ponar for deployment. Wood personnel investigates ponar grab for evidence of seagrass.

PHOTO 4:

Wood personnel sieve material collected by a petite ponar grab for benthic invertebrates.

PHOTO 5:

Collected materials after sieving.

PHOTO 6:

Wood personnel use water bottle to collect invertebrate samples from a sifter.

PHOTO 7:

Placing sediment collected using petite ponar into sample containers for laboratory testing.

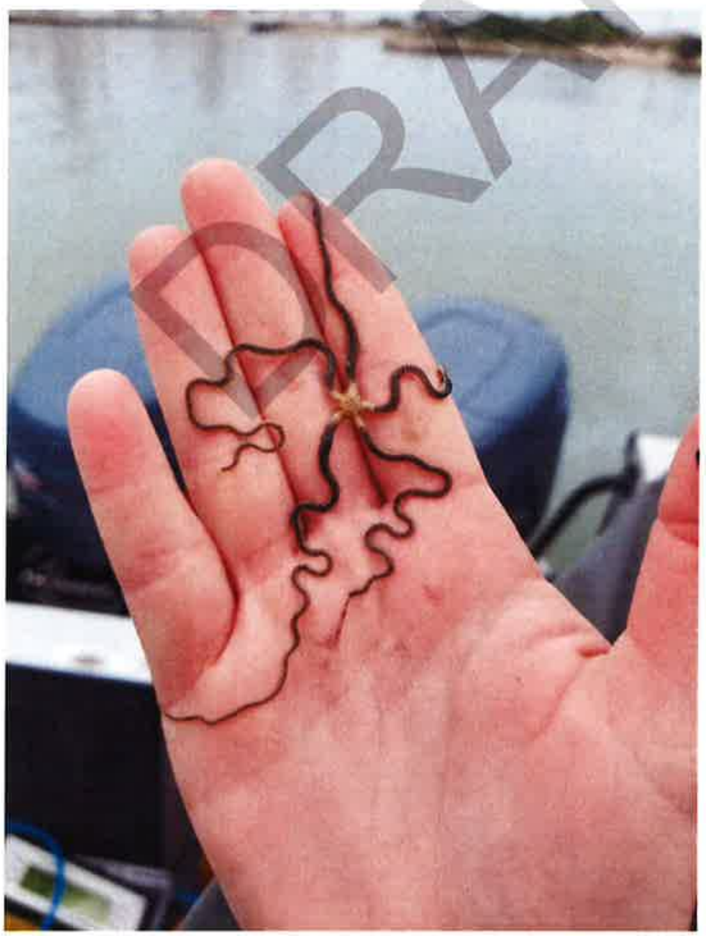

PHOTO 8:

Brittle star (Ophiuroidea sp.) species caught in a petite ponar grab.

PHOTO 9:

Bay Anchovy (*Anchoa mitchilli*) caught in a petite ponar grab.

PHOTO 10:

Luidia clathrata caught during a petite ponar grab.

PHOTO 11:

Wood and Naismith personnel deploy plankton net.

PHOTO 12:

Wood observes and maintains plankton net.

PHOTO 13:

Naismith personnel maintaining stability of plankton net while in water.

PHOTO 14:

Plankton net being retrieved.

PHOTO 15:

Wood personnel rinsing the net to get all organisms down to the sample collection container at the cod end.

PHOTO 16:

Wood personnel use a fine mesh sieve to concentrate plankton samples prior to transferring to sample containers.

PHOTO 17:

Plankton sample collection container.

PHOTO 18:

Wood personnel use a 10% formalin solution to fix all benthic invertebrate samples.

PHOTO 19:

Wood supporting the Valeport 106 Water Velocity Meter.

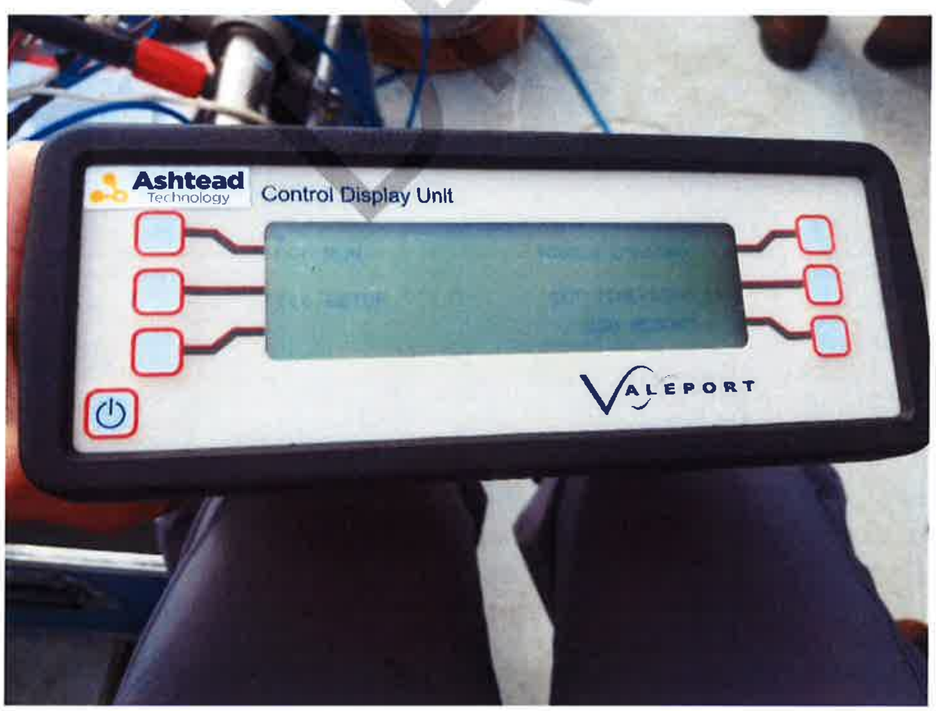

PHOTO 20:

Valeport 106 Water Velocity Meter display screen.

PHOTO 21:

Wood and Naismith personnel preparing to deploy the Valeport 106 Water Velocity Meter.

PHOTO 22:

Wood and Naismith personnel deploying the Valeport 106 Water Velocity Meter.

ATTACHMENT 2

DATASHEETS

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: Ship Berth
DATE: 2-7-19
GPS COORDINATES: 27.84407
(ACTUAL) -97.06578

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1142	5			0.432	~~0.046~~	~~89.3~~ 83.8	ebb	
	10			0.361	~~0.487~~	~~63.7~~	68.4	
	15				0.259	58.2		
	20				0.167	91.2		
	25				0.249	82.5		
	30				0.370	56.1		
	35				0.390	52.0		
	40				0.346	60.3		
1144	45				0.207	86.6		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: Ship Berth (L2->L3)
DATE: 3/11/2019
GPS COORDINATES: ~~27.84495cm~~ 27.84409
(ACTUAL) -97.06571

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature ~~(°C)~~	~~Salinity~~ (ppt)	~~Dissolved~~ Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1058	5				0.140	57.1	Flood	
	10				0.138	52.8		
	15				0.057	32.8		
	20				0.095	347.6		
	25				0.077	291.0		
	30				0.097	284.4		
	35				0.077	255.3		
	40				0.143	250.4		
1101	45				0.157	249.7		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: ~~DB~~ + SM

SAMPLE LOCATION: Ship Berth 1A
DATE: 2/1/2019
GPS COORDINATES: 27.84837
(ACTUAL) -97.46187

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
0956	5				0.050	214.4	Flood	
	10				0.177	234.9		
	15				0.123	223.1		
0957	20				0.169	223.3		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: Ship Berth 1A
DATE: 7/11/2019
GPS COORDINATES: 27.84826
(ACTUAL) -97.06189

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1949	5				.332	345.8	EBB	
	10				.087	19.1		
	15				.055	71.7		
1951	20				.050	68.6		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: Intake ½, Berth 1B Shallow
DATE: 2-7-19
GPS COORDINATES: 27.84402
(ACTUAL) -97.06834 ~~-97.06102~~ SCM

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1122	5				~~0.2~~ 0.199	338.4	ebb	
1123	10				0.265	114.7	↓	

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: Intake & Berth 1B - Deep
DATE: ~~2-11-19~~ 2-7-19
GPS COORDINATES: SCM 27.84397
(ACTUAL) -97.06768

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1129	5				0.577	62.2	ebb	
	10				0.414	62.2		
	15				0.385	62.7		
	20				0.384	60.2		
	25				0.483	66.9		
1130	30				0.455	46.5		
1130	35				0.307	74.0		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: Intake & Berth 1B
DATE: 2/11/2019
GPS COORDINATES: 27.84393
(ACTUAL) -97.06789

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity ~~(m/s)~~ ft/s AB	Direction	Ebb/Flow	Comments
0932	5				0.037	33.6	Flood	
	10				0.421	152.5		
	15				0.181	209.1		
	20				0.112	246.1		
0934								

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: Ship Berth 1C
DATE: 2-7-19
GPS COORDINATES: 27.84475
(ACTUAL) -97.06200

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1158	5				0.231	233.4	ebb	likely in slack tide
	10				0.261	246.6		
	15				0.~~0[illegible]~~166	203.0		
	20				0.246	273.3		
	25				0.071	155.2		
	30				0.048	141.2		
	35			0.140	~~0.[illegible]~~	150.8		
	40				0.272	71.9		
	45				0.454	102.0		
	50				0.284	47.7		
1204	55				0.421	62.8		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: Ship Berth 1C
DATE: 2/11/2019
GPS COORDINATES: 27.84470
(ACTUAL) -97.06207

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
0944	5				0.149	165.5	Flood	
	10				0.299	173.0		
	15				0.147	193.4		
	20				0.172	170.2		
	25				0.203	161.3		
	30				0.158	185.1		
	35				0.158	208.2		
	40				0.115	217.7		
	45				0.139	258.2		
	50				0.106	240.4		
0948	55				0.118	254.4		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: DB + SM

SAMPLE LOCATION: LS (original)
DATE: 2/11/2019
GPS COORDINATES: 27.84367
(ACTUAL) -97.05992

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1026	5				0.082	246.1	Flood	
	10				0.050	248.0		
	15				0.141	270.4		
	20				0.152	231.5		
	25				0.155	226.7		
	30				0.057	211.3		
	35				0.127	192.8		
	40				0.236	346.7		
	45				0.182	349.4		
	50				0.158	14.5		
1031	55				0.039	58.8		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: L6
DATE: 2/11/2019
GPS COORDINATES: 27.84254
(ACTUAL) -97.05746

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
2016	5				.113	281.4	EBB	
	10				.384	49.5		
	15				.540	52.8		
	20				.365	47.8		
	25				.275	51.0		
	30				.421	50.1		
	35				.245	26.8		
	40				.195	21.4		
2018	45				.151	36.5		
				L5				GPS Coordinates (Actual):
2022	5				.667	77.7	EBB	27.84308
5CM	10				.590	70.7		-97.06057
	15				.677	59.3		
	20				.637	59.9		
	25				.439	56.6		
	30				.446	69.2		
	35				.514	74.0		
	40				.465	46.0		
2024	45				.289	35.7		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: L6 (original)
DATE: 2/11/2019
GPS COORDINATES: 27.84271
(ACTUAL) -97.05746

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1018	5				0.131	357.7	Flood	
	10				0.076	354.8		
	15				0.105	339.0		
	20				0.108	318.9		
	25				0.074	354.4		
	30				0.102	340.1		
	35				0.196	290.9		
	40				0.134	313.8		
	45				0.207	299.9		
	50				0.216	299.6		
1022	55				0.114	260.8		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: Turning Basin 2 ~~TB2 (L1)~~ SCM
DATE: 2/11/2019
GPS COORDINATES: 27.84516
(ACTUAL) -97.05539

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature ~~(°C)~~	Salinity ~~(ppt)~~	Dissolved Oxygen ~~(ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
2003	5				0.085	181.6	EBB	
	10				0.155	57.6		
2004	15				0.288	63.8		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

Turning Basin 2

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: ~~L7 (TB3)~~ SM
DATE: 2/11/2019
GPS COORDINATES: 27.84523
(ACTUAL) -97.05537

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1008	5				0.173	284.9	Flood	
1009	10				0.070	304.8	⊥	

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: BB / SM

SAMPLE LOCATION: L8
DATE: 2/11/2019
GPS COORDINATES: 27.84707
(ACTUAL) -97.05651

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
2009	5				.065	140.3	EBB	
2010	10				.226	89.3		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB &SM

SAMPLE LOCATION: BB L08
DATE: 7/11/2019
GPS COORDINATES: 27.84710
(ACTUAL) -97.05650

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1047	5				0.456	10.9	Flood	
1047	10				0.367	21.7	⊥	
1								

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

wood.

WATER SAMPLING PARAMETERS

Turning Basin 1

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: ~~V9 LL-9~~ SCM
DATE: 2/15/2019
GPS COORDINATES: 27.84554
(ACTUAL) -97.05748

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flood	Comments
0911	5				0.128	352.6	Flood	
	10				0.260	26.6		
	15				0.298	40.9		
	20				0.267	32.6		
	25				0.108	25.7		
	30				0.163	145.4		
	35				0.132	234.0		
	40				0.158	281.4		
0914	45				0.217	9.5		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

Turning Basin 1

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB &SM

SAMPLE LOCATION: ~~TB1 (L9)~~
DATE: 2/11/2019
GPS COORDINATES: 27.84550
(ACTUAL) -97.05750

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1956	5				.110	128.1	EBB	
	10				.080	28.9		
	15				.070	22.2		
	20				~~[illegible]~~ .277	18.4		
	25				.072	14.5		
	30				.360	22.9		
	35				.049	61.4		
	40				.103	42.5		
1959	45				.164	10.0		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: BB JSM

SAMPLE LOCATION: L40
DATE: 2/11/2019
GPS COORDINATES: 27.84794
(ACTUAL) -97.05929

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature ~~(°C)~~	Salinity ~~(ppt)~~	Dissolved Oxygen ~~(ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1039	5				0.041	221.3	Flood	
	10				0.110	333.0		
	15				0.106	358.1		
	20				0.187	9.9		
1041	25				0.123	16.2		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

wood.

WATER SAMPLING PARAMETERS

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB & SM

SAMPLE LOCATION: L-10 ~~V10~~ ~~(L-10)~~ SCM
DATE: 2/11/2019
GPS COORDINATES: 27.84791
(ACTUAL) -97.05933

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
0850	5				0.151	130.0	EBB	
~~0852~~	10				0.117	14.3		
	15				0.196	17.2		
	20				0.126	34.1		
	25				0.066	17.6		
0858	30				0.126	351.2		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: (L-12) V-12, Shallow
DATE: 2-7-19
GPS COORDINATES: 27.85055
(ACTUAL) -97.06259

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
1413	5				0.256	102.3	~~Flood~~ EBB	

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

(L-12)

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: V12 Deep
DATE: 2-7-19
GPS COORDINATES: 27.84885
(ACTUAL) -97.06048

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	~~Velocity (m/s)~~	Direction	Ebb/Flow	Comments
1417	5				0.736	301.7	Flood	
	10				0.493	314.5		
	15				0.518	327.2		
	20				0.372	325.2		
1418	25				0.581	324.5		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: AB + SM

SAMPLE LOCATION: V12 (L-12)
DATE: 2/11/2019
GPS COORDINATES: 27.84935
(ACTUAL) -97.06102

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	~~Depth (ft.)~~	~~Temperature (°C)~~	~~Salinity (ppt)~~	~~Dissolved Oxygen (ml/L)~~	Velocity (m/s)	Direction	Ebb/Flow	Comments
0837	5				0.321	18.6	Ebb	
	10				0.465	14.3		
	15				0.391	26.3		
0838	20				0.330	27.2		

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-1
DATE: ~~2-14-19~~ 2-4-19
GPS COORDINATES: 27.84432
(ACTUAL) -97.06974

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
~~1110~~		~~15.72~~	~~41.99~~	~~8.61~~ SCM				SCM
1118	2.80	15.74	27.00	96.34				
1120	2.80	15.76	27.01	SCM 81.38				
1122	2.80	15.74	27.00	81.03				
				DO Readings invalid, recalibrated YSI and went back to L-1 to retake readings.				
1610	2.80	16.49	24.01	4.43				
1612	2.80	16.59	23.67	4.39				
1614	2.80	16.62	23.81	~~4.92~~ SCM 4.92				

DRAFT

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-2
DATE: 2-5-19
GPS COORDINATES: 27.84454
(ACTUAL) -97.06691

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1000	5.0	15.68	21.29	7.51				
1002	5	15.67	21.28	6.27				
1003	10	15.64	21.29	7.73				
1004	10	15.64	21.28	7.79				
1006	15	15.63	21.28	7.69				
1007	15	15.68	21.29	7.68				
1009	20	15.77	21.34	7.33				
1010	20	15.81	21.36	7.65				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-3
DATE: 2-5-19
GPS COORDINATES: 27.84455
(ACTUAL) -97.06724

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1044	5	16.46	20.11	6.06				
1045	5	16.41	19.96	5.78				
1047	10	16.05	21.44	6.22				
1048	10	16.03	21.41	6.26				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-4
DATE: 2-5-19
GPS COORDINATES: 27.84496
(ACTUAL) ~~[illegible]~~ SCM -97.06271

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1457	5	16.91	17.21	5.80				
1458	5	16.94	17.02	5.78				
1500	10	16.72	18.04	6.13				
1501	10	16.71	18.02	~~7.19~~ 5.73				
1503	15	16.68	18.41	5.72 SCM				
1504	15	16.69	18.28	5.72				
1506	20	16.63	~~18.~~ SCM 19.13	5.70				
1507	20	16.61	19.08	SCM 4.25				
1509	25	16.30	21.55	4.23				
1510	25	16.29	21.59	4.61				
	~~3~~ ~~30~~ SCM							
	~~3~~ SCM							

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-5
DATE: 2-5-19
GPS COORDINATES: 27.84707
(ACTUAL) -97.05827

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1602	5	16.58	18.20	6.27				
1603	5	16.47	18.38	5.92				
1605	10	16.24	20.98	5.89				
1606	10	16.11	20.74	~~4.44~~ SCM 5.87				
1608	15	16.15	21.05	5.84				
1609	15	16.04	20.98	5.86				
1611	20	16.12	21.12	6.16				
1612	20	16.09	21.10	6.20				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-6
DATE: 2-6-19
GPS COORDINATES: 27.84478
(ACTUAL) -97.05560

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1541	5	16.88	16.21	5.85				
1542	5	16.87	16.22	6.20				
1544	10	16.83	16.48	5.84				
1545	10	16.82	16.42	5.89				
~~1546~~ 1547 SCM	15	16.82	16.77	5.81				
1548	15	16.81	16.80	6.19				
1550	20	16.76	17.45	5.82				
1551	20	16.76	17.41	5.83				
~~1552~~ 1553 SCM	25	16.75	17.60	6.17				
1554	25	16.75	17.51	5.95				
1556	30	16.74	17.67	5.85				
1557	30	16.76	17.45	5.82				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-7
DATE: 2-4-19
GPS COORDINATES: 27.84531
(ACTUAL) -97.05544

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1512	5	16.23	21.52	4.45				
1514	5	16.05	22.48	4.29				
1515 SCM	10	15.90	24.17	4.62				
1518 SCM	10	15.91	24.67	4.25				
1520 SCM	15	15.86	25.02	4.25				
152[illegible] SCM	15	15.87	25.07	4.57				

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(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-8
DATE: 2-4-19
GPS COORDINATES: 27.84708
(ACTUAL) -97.05653

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1420	5	16.02	20.40	5.85				
1422	5	16.01	20.63	SCM 6.16				
1424	10	15.95	22.50 SCM	6.10				
1426	10	15.94	21.99	6.15				
1428	15	15.97	24.69	6.06				
1430	15	15.96	23.25	6.08 SCM				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

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01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-9
DATE: 2-6-19
GPS COORDINATES: 27.84550
(ACTUAL) -97.05749

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1440	5	16.84	15.33	6.09				
1441	5	16.76	15.52	6.31				
1443	10	16.75	16.00	5.94				
1444	10	16.76	16.25	5.96				
1446	15	~~17.~~ 16.77	17.34	6.21				
1447	15	16.71	17.42	6.19				
1449	20	16.78	17.26	5.89				
1450	20	16.78	17.57	6.17				
1452	25	16.86	17.69	6.15				
1453	25	16.86	17.68	6.01				
1455	30	16.82	17.73	5.72				
1456	30	16.76	17.92	6.19				
1458	35	16.73	17.95	5.93				
1459	35	16.73	17.95	5.90				
1501	40	16.72	18.00	6.19				
1502	40	16.72	17.96	5.93				
~~1504~~	~~45~~	SCM						New Lead Line = 44.9'
~~1505~~	~~45~~	SCM						No need for 45' reading

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM+CAT

SAMPLE LOCATION: L-10
DATE: 2-6-19
GPS COORDINATES: 27.84793
(ACTUAL) -97.05938

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1350	5	16.86	15.38	6.09				
1351	5	16.91	15.37	6.02				
1353	10	16.88	15.36	6.29				
1354	10	16.90	15.32	6.06				
1356	15	16.82	15.31	6.01				
1357	15	16.81	15.33	5.98				
1359	20	16.79	15.46	6.23				
1400	20	16.79	15.46	6.31				
1402	25	16.81	16.30	6.21				
1403	25	16.77	16.46	6.06				
1405	30	16.68	17.24	5.94				
1406	30	16.68	17.29	5.84				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-11
DATE: 2-5-19
GPS COORDINATES: 27.84906
(ACTUAL) -97.06112

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1346	5	~~25.72~~ 16.19	15.71	6.23				
1347	5	~~25.80~~ 16.13	15.78	6.21				
1349	10	~~26.?~~ 16.59	16.07	6.17				
1350	10	16.62	16.17	5.78				
1352	15	16.73	16.23	6.20				
1353	15	16.72	16.22	6.11				
1355	20	16.64	17.01	5.89				
1356	20	17.06	17.59	5.62				
1358	25	16.12	18.91	5.65				
1359	25	16.12	19.19	5.68				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-12
DATE: 2/4/19
GPS COORDINATES: 27.85090
(ACTUAL) -97.06234

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1346	5.0	16.33	20.44	4.66				
1348	5.0	16.30	20.28	4.22				
1350	5.0	16.26	20.32	4.64				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-13
DATE: 2-5-19
GPS COORDINATES: 27.84874
(ACTUAL) -97.06274

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1220	5	16.98	16.46	6.11				
1221	5	17.02	16.51	6.12				
1223	10	17.59	17.62	7.00				
1224	10	17.62	17.67	7.01				
1226	15	17.78	17.91	6.97				
1227	15	17.73	17.84	6.99				
1229	20	17.80	17.95	7.29				
1230	20	17.78	17.92	6.97				
1231	25	17.82	17.99	6.95				
1232	25	17.82	17.97	7.09				

SCM

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM + CAT

SAMPLE LOCATION: L-14
DATE: 2-5-19
GPS COORDINATES: 27.84787
(ACTUAL) -97.06194

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1140	5	16.92	16.71	~~7~~ SCM 6.26				
1141	5	16.92	16.73	6.99				
1143	10	16.92	16.72 SCM	6.20				
1144	10	16.92	16.73	6.18				
1146	15	16.91	16.71	6.18				
1147	15	17.19 SCM	17.18	SCM 6.79				
1149	SCM 20	17.72	18.01 SCM	7.36				
1150	20	17.75	18.04	7.05				
1152	25	17.75	18.06	7.38				
1153	25	17.75	18.06	7.04				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

WATER SAMPLING PARAMETERS

wood.

PROJECT NUMBER: 6703180051
CLIENT: Port of Corpus Christi Authority
SITE LOCATION: Project Turnpike
SCIENTIST: SCM+CAT

SAMPLE LOCATION: L-15
DATE: 2-6-19
GPS COORDINATES: 27.84602
(ACTUAL) -97.06012

VARIANCE TIME:
MLLW VARIANCE (ft.)(a) +/-
DEPTH TO SEDIMENT (ft.)
SEDIMENT ELEV. (MLLW) (ft.)

Time	Depth (ft.)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (ml/L)	Velocity (m/s)	Direction	Ebb/Flow	Comments
1245	5	17.88	15.68	SCM ~~8.32~~ 6.88				
1246	5	17.62	15.71	7.30				
1248	10	17.52	15.79	6.85				
1249	10	17.34	15.79	6.83				
1251	15	17.11	16.01	6.90				
1252	15	17.04	16.00	6.89				
1254	20	16.84	16.23	6.90				
1255	20	16.83	16.57	6.94				
1257	25	16.74	16.70	6.06				
1258	25	16.70	16.69	6.56				
1300	30	16.66	17.20	6.44				
1321 ~~1301~~ SCM	30	16.66	17.21	6.15				20 minutes lost due to
1323 ~~1303~~ SCM	35	16.63	17.45	6.29				YSI Malfunction
1324 ~~1304~~ SCM	35	16.63	17.63	6.28				
1326 ~~1306~~ SCM	40	16.62	17.65	6.32				
1327 ~~1307~~ SCM	40	16.60	17.78	6.01				
1329 ~~1309~~ SCM	45	16.61	18.04	6.30				
1330 ~~1310~~ SCM	45	16.60	18.04	6.30				
1332 ~~1312~~	50	16.62	18.07	6.44				
1333 ~~[illegible]~~ SCM	50	16.62	18.06	6.19				

(a) MLLW variance taken from NOAA (National Oceanic and Atmospheric Administration) Tides and Currents; Port Aransas, TX, Station ID: 8775237

01/24/2019

wood.

FIELD INSTRUMENT CALIBRATION SHEET

Project Name: Project Turnpike

Project Number: 6703180051.0003

Date: 2-4-19

Equipment Type: Water Quality Meter

Manufacturer: SCM ~~Horiba~~ YSI

Model Number: SCM ~~U-52~~ 6920

Serial Number: 07F100587

Calibration (as necessary, minimum twice per day):

Calibration #1	~~pH~~	Cond.	~~Turb.~~	DO	~~ORP~~
Calibration Standard:	~~4.0~~	~~4.49~~ 1.413	~~0.0~~	–	~~200/300~~
Instrument Reading:	/	1.415	/	–	/

Time: 0825

Calibration (as necessary, minimum twice per day):

Calibration #2	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	–	200-300
Instrument Reading:					

Time:

Calibration (as necessary, minimum twice per day):

Calibration #3	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	–	200-300
Instrument Reading:					

Time:

Calibration (as necessary, minimum twice per day):

Calibration #4	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	–	200-300
Instrument Reading:					

Time:

Date of Last Calibration: —

Date(s) Instrument Used: —

Name of person(s) who calibrated instruments: Samuel ~~G.~~ C. Macon

Calibration Standards Used:

(1) 1.413 mS/cm Sp. Conductance Standard

(2)

(3)

(4)

Source of Calibration Standards: AquaPhoenix ~~Solutions~~ SCM Scientific (Pine)

Miscellaneous Comments: —

Calibrated by: Samuel C. Macon

FIELD INSTRUMENT CALIBRATION SHEET

wood.

Project Name: Project Turnpike

Project Number: 6703180051.0003

Date: 2-5-19

Equipment Type: Water Quality Meter

Manufacturer: ~~Horiba~~ SCM YSI

Model Number: ~~U-52~~ SCM 6920

Serial Number: 07F100587

Calibration (as necessary, minimum twice per day):

Calibration #1 Time: 0755

	~~pH~~	Cond.	~~Turb.~~	DO	~~ORP~~
Calibration Standard:	~~4.0~~	~~4.49~~ 1.413	~~0.0~~	--	~~200-300~~
Instrument Reading:		1.399			

Calibration (as necessary, minimum twice per day):

Calibration #2 Time: ______

	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	--	200-300
Instrument Reading:					

Calibration (as necessary, minimum twice per day):

Calibration #3 Time: ______

	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	--	200-300
Instrument Reading:					

Calibration (as necessary, minimum twice per day):

Calibration #4 Time: ______

	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	--	200-300
Instrument Reading:					

Date of Last Calibration: 2-4-18

Date(s) Instrument Used: 2-5-19

Name of person(s) who calibrated instruments: Samuel C. Mecan

Calibration Standards Used:

(1) 1.413 mS/cm Sp. Conductance Standard

(2)

(3)

(4)

Source of Calibration Standards: Aquaphoenix Scientific (Pine)

Miscellaneous Comments: —

Calibrated by: SCM Samuel C Mecan

DRAFT

wood.

FIELD INSTRUMENT CALIBRATION SHEET

Project Name: Project Turnpike

Project Number: 6703180051.0003

Date: 2-6-19

Equipment Type: Water Quality Meter

Manufacturer: ~~Horiba~~ YSI

Model Number: ~~U-52~~ 6920

Serial Number: 91F0883

Calibration (as necessary, minimum twice per day):

Calibration #1 Time: 0755

	~~pH~~	Cond. 1.413 mS/cm	~~Turb.~~	DO	~~ORP~~
Calibration Standard:	~~4.0~~	1.413 ~~4.49~~	~~0.0~~	--	~~200-300~~
Instrument Reading:	/	1.411	/	3.45	

Calibration (as necessary, minimum twice per day):

Calibration #2 Time: ______

	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	--	200-300
Instrument Reading:					

Calibration (as necessary, minimum twice per day):

Calibration #3 Time: ______

	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	--	200-300
Instrument Reading:					

Calibration (as necessary, minimum twice per day):

Calibration #4 Time: ______

	pH	Cond.	Turb.	DO	ORP
Calibration Standard:	4.0	4.49	0.0	--	200-300
Instrument Reading:					

DRAFT

Date of Last Calibration: 2-5-19

Date(s) Instrument Used: 2-6-19

Name of person(s) who calibrated instruments: Samuel C. McCan

Calibration Standards Used:

(1) 1.413 mS/cm SP. Conductance Standard

(2)

(3)

(4)

Source of Calibration Standards: Aquaphoenix ~~Solutions~~ Scientific SCM (Pine)

Miscellaneous Comments: Serial #: ~~~~ Handset changed out for this day, hence the ~~dif~~ SCM different serial #.

Calibrated by: Saml C Mccan

Q:\6706\2018 Wood Field Forms\U-22 Instrument Calibration.doc

Corpus Christi
Field Form – Plankton Sampling

9,481 Counts

Project Information

Sample ID: P-1
Collection Date: 6 Feb 2019
Sampling Method: plankton tow b4 spas 1574
Collection Time: 1035 am
Client: Port of Corpus Christi
Field Team: Carl Teinert, Jennifer Davenport, Naismith Marine, Ashley Bogran, Sam Macon
Location: Port Aransas, TX -
Weather: cloudy

DRAFT

Operational Data

Tow location (CIRCLE ONE): SURFACE MIDDLE BOTTOM Other: oblique

Depth (ft) Start 82' End
Depth (m): Start End

Sample Start Time: 9:57 **am** or pm
Sample Stop Time: 10:07 **am** or pm

Start Flow Meter Reading: 1583
Stop Flow Meter Reading: 16447

Effort (seconds): 600 seconds
Waypoint ID: WPT N/A

GPS Location: Longitude Start see boat log End N **North**
Latitude: ~~see boat log~~ W **West**

Comments (observations, etc)

Distance (m) = $\frac{(16447-1583) \times 26,873}{999,999}$ = 399.44 m

Speed (cm/s) = $\frac{399.44 \times 100}{600}$ = 66.57 cm/s

Volume (m³) = 3.14159 × .25² × 399.44 = 78.43 m³

Signature: ______ Date: ______ Page ____ of ____

Data form QA'd ______ by ______.
Date Initials

Data entered in db ______ by ______.
Date Initials

Data entry QA'd ______ by ______.
Date Initials

Corpus Christi
Field Form – Plankton Sampling

Project Information

Sample ID: P-2
Collection Date: 6 Feb 2019
Sampling Method: plankton tow/bott 1 & 2
Collection Time: 11:22am
Client: Port of Corpus Christi
Field Team: Carl Teiner, Jennifer Davenport, Sam Mason, Ashley Bregard, Natsumi Martin
Location: Port Aransas, TX
Weather: cloudy

Operational Data

Tow location (CIRCLE ONE): SURFACE MIDDLE BOTTOM Other: oblique

Depth (ft) Start: 41' End: 64'
Depth (m): Start: End:

Sample Start Time: 1054 **am or pm**
Sample Stop Time: 1103 **am or pm**

Start Flow Meter Reading: 17593
Stop Flow Meter Reading: 29317

Effort (seconds): 540
Waypoint ID: WPT N/A

GPS Location: Longitude see boat log **North** **Latitude:** see boat log **West**

Comments (observations, etc)

$$\text{Distance (m)} = \frac{(29317 - 17593) \times 26{,}873}{999{,}999} = 315.06\,m$$

$$\text{Speed (cm/s)} = \frac{315.06 \times 100}{540} = 58.34\,cm/s$$

$$\text{Volume } (m^3) = 3.14159 \times .25^2 \times 315.06\,m = 61.86\,m^3$$

Signature: ______ Date: ______ Page ____ of ____

Data form QA'd ______ (Date) by ______ (Initials). Data entered in db ______ (Date) by ______ (Initials). Data entry QA'd ______ (Date) by ______ (Initials).

Corpus Christi, TX Benthic Samples				
Project #:	6703180051		**Samplers:**	Ashley Bonrand, Carl Teinert, Sam Macon, Jennifer Davenport
Sample ID	**Sample Date**	**Collection Time**	**P/A Seagrass & Oysters**	**Comments**
L-1	4 Feb 2019	11:38am	Absent	fine sand, little shell hash
L-2	5 Feb 2019	10:15am	Present	- Halodule + [illegible] - fine mud, clay
L-3	5 Feb 2019	10:53am	Absent	Shell hash, sand
L-4	5 Feb 2019	15:18	Absent	Clay, shell hash
L-5	5 Feb 2019	16:12	Absent	Sand
L-6	6 Feb 2019	16:05	Absent	shell hash, Dispatra tubes
L-7	4 Feb 2019	15:20	Absent	fine sand, very small sample
L-8	4 Feb 2019	14:33	Absent	fine sand, very small sample
L-9	6 Feb 2019	15:00	Absent	sand, shell hash
L-10	6 Feb 2019	13:56	Absent	dried Halodule, fine sand, mud
L-11	5 Feb 2019	13:57	Absent	shell hash, fine sand
L-12	4 Feb 2019	13:15	Absent	fine sand, larger shell hash
L-13	5 Feb 2019	12:41	Present - 1 piece of Syringodium	rocks, shell hash, fine sand
L-14	5 Feb 2019	12:00	Absent	mud, shell hash, 1 dead oyster, clay
L-15	6 Feb 2019	12:55	Present - 1 piece of Halodule	mud, fine sand

Thalassia testudinum = turtle grass

shoal grass
Halodule -
flat, tiny
strings

Syringodium filiforme = manatee
spaghetti
round
w/ thalassia

Ruppia = widgeon

Flowmeter Model General Oceanics, Mechanical Flowmeter, Model #2030R
Rotor Constant 26873

Station ID	Date	Time	Tech(s)	Mesh Size, microns	Opening Diameter, cm	Initial Time	Final Time	Elapsed Time, min	Initial Count, Flowmeter
P-1	2/6/2019	10:35	JSD, CT, SM, AB	333	50	9:57	10:07	0:10	1583
P-2	2/6/2019	11:22	JSD, CT, SM, AB	333	50	10:54	11:03	0:09	17593

Final Count, Flowmeter	Turns	Distance, m	Speed, cm/sec	Volume, cubic meters
16447	14864	399.44	66.57	78.43
29317	11724	315.06	58.34	61.86

ATTACHMENT 3

LABORATORY REPORTS

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 27, 2019

Carl Teinert
Wood Environment & Infrastructure Solutions
3755 S. Capital of Texas Highway
Ste. 375
Austin, TX 78704

Work Order: **HS19020370**

Laboratory Results for: **PCCA Turnpike 6703180051**

Dear Carl,

ALS Environmental received 14 sample(s) on Feb 07, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client: Wood Environment & Infrastructure Solutions
Project: PCCA Turnpike 6703180051
Work Order: HS19020370

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19020370-01	L-1	Sediment		04-Feb-2019 11:55	07-Feb-2019 07:30	☐
HS19020370-02	L-2	Sediment		05-Feb-2019 10:15	07-Feb-2019 07:30	☐
HS19020370-03	L-3	Sediment		05-Feb-2019 10:55	07-Feb-2019 07:30	☐
HS19020370-04	L-4	Sediment		05-Feb-2019 15:15	07-Feb-2019 07:30	☐
HS19020370-05	L-5	Sediment		05-Feb-2019 16:20	07-Feb-2019 07:30	☐
HS19020370-06	L-7	Sediment		04-Feb-2019 15:30	07-Feb-2019 07:30	☐
HS19020370-07	L-8	Sediment		04-Feb-2019 14:40	07-Feb-2019 07:30	☐
HS19020370-08	L-9	Sediment		06-Feb-2019 15:05	07-Feb-2019 07:30	☐
HS19020370-09	L-10	Sediment		06-Feb-2019 14:07	07-Feb-2019 07:30	☐
HS19020370-10	L-11	Sediment		05-Feb-2019 14:00	07-Feb-2019 07:30	☐
HS19020370-11	L-12	Sediment		04-Feb-2019 13:25	07-Feb-2019 07:30	☐
HS19020370-12	L-13	Sediment		05-Feb-2019 12:51	07-Feb-2019 07:30	☐
HS19020370-13	L-14	Sediment		05-Feb-2019 12:00	07-Feb-2019 07:30	☐
HS19020370-14	L-15	Sediment		06-Feb-2019 13:05	07-Feb-2019 07:30	☐

Client:	Wood Environment & Infrastructure Solutions	**CASE NARRATIVE**
Project:	PCCA Turnpike 6703180051	
Work Order:	HS19020370	

Work Order Comments

- The analysis for Grain Size was subcontracted to Tolunay-Wong Engineers in Houston, TX. Final report attached.

WetChemistry by Method SW9060

Batch ID: 137969

Sample ID: L-2 (HS19020370-02MS)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Total Organic Carbon)

Sample ID: L-2 (HS19020370-02MSD)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Total Organic Carbon)

ALS Houston, US Date: 27-Feb-19

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-1		Lab ID:HS19020370-01
Collection Date:	04-Feb-2019 11:55		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.0630**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Feb-19

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-2		Lab ID:HS19020370-02
Collection Date:	05-Feb-2019 10:15		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.475**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-3		Lab ID:HS19020370-03
Collection Date:	05-Feb-2019 10:55		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.407**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-4		Lab ID:HS19020370-04
Collection Date:	05-Feb-2019 15:15		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.319**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-5		Lab ID:HS19020370-05
Collection Date:	05-Feb-2019 16:20		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	U		0.0600	0.0600	wt%-dry	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-7		Lab ID:HS19020370-06
Collection Date:	04-Feb-2019 15:30		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	U		0.0600	0.0600	wt%-dry	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		ANALYTICAL REPORT
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-8		Lab ID:HS19020370-07
Collection Date:	04-Feb-2019 14:40		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	U		0.0600	0.0600	wt%-dry	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-9		Lab ID:HS19020370-08
Collection Date:	06-Feb-2019 15:05		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	U		0.0600	0.0600	wt%-dry	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-10		Lab ID:HS19020370-09
Collection Date:	06-Feb-2019 14:07		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.0670**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-11		Lab ID:HS19020370-10
Collection Date:	05-Feb-2019 14:00		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.515**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-12		Lab ID:HS19020370-11
Collection Date:	04-Feb-2019 13:25		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.161**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-13		Lab ID:HS19020370-12
Collection Date:	05-Feb-2019 12:51		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.494**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-14		Lab ID:HS19020370-13
Collection Date:	05-Feb-2019 12:00		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	**0.264**		**0.0600**	**0.0600**	**wt%-dry**	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Wood Environment & Infrastructure Solutions		**ANALYTICAL REPORT**
Project:	PCCA Turnpike 6703180051		WorkOrder:HS19020370
Sample ID:	L-15		Lab ID:HS19020370-14
Collection Date:	06-Feb-2019 13:05		Matrix:Sediment

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY SW9060A		**Method:SW9060**			Prep:SW9060 / 21-Feb-2019		Analyst: KMU
Total Organic Carbon	U		0.0600	0.0600	wt%-dry	1	23-Feb-2019 10:30
SUBCONTRACT ANALYSIS - GRAIN SIZE		**Method:NA**					Analyst: SUB
Subcontract Analysis	See Attached		0		NA	1	27-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Wood Environment & Infrastructure Solutions
Project: PCCA Turnpike 6703180051
WorkOrder: HS19020370

Batch ID: 137969 **Method:** TOTAL ORGANIC CARBON BY SW9060A **Prep:** TOC_SOLID_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020370-01	1	0.5	0.5 (mL)	1
HS19020370-02	1	0.5	0.5 (mL)	1
HS19020370-03	1	0.5	0.5 (mL)	1
HS19020370-04	1	0.5	0.5 (mL)	1
HS19020370-05	1	0.5	0.5 (mL)	1
HS19020370-06	1	0.5	0.5 (mL)	1
HS19020370-07	1	0.5	0.5 (mL)	1
HS19020370-08	1	0.5	0.5 (mL)	1
HS19020370-09	1	0.5	0.5 (mL)	1
HS19020370-10	1	0.5	0.5 (mL)	1
HS19020370-11	1	0.5	0.5 (mL)	1
HS19020370-12	1	0.5	0.5 (mL)	1
HS19020370-13	1	0.5	0.5 (mL)	1
HS19020370-14	1	0.5	0.5 (mL)	1

Client: Wood Environment & Infrastructure Solutions
Project: PCCA Turnpike 6703180051
WorkOrder: HS19020370

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137969		**Test Name :** TOTAL ORGANIC CARBON BY SW9060A		**Matrix:** Sediment		
HS19020370-01	L-1	04 Feb 2019 11:55		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-02	L-2	05 Feb 2019 10:15		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-03	L-3	05 Feb 2019 10:55		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-04	L-4	05 Feb 2019 15:15		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-05	L-5	05 Feb 2019 16:20		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-06	L-7	04 Feb 2019 15:30		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-07	L-8	04 Feb 2019 14:40		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-08	L-9	06 Feb 2019 15:05		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-09	L-10	06 Feb 2019 14:07		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-10	L-11	05 Feb 2019 14:00		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-11	L-12	04 Feb 2019 13:25		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-12	L-13	05 Feb 2019 12:51		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-13	L-14	05 Feb 2019 12:00		21 Feb 2019 16:20	23 Feb 2019 10:30	1
HS19020370-14	L-15	06 Feb 2019 13:05		21 Feb 2019 16:20	23 Feb 2019 10:30	1
Batch ID R333655		**Test Name :** SUBCONTRACT ANALYSIS - GRAIN SIZE		**Matrix:** Sediment		
HS19020370-01	L-1	04 Feb 2019 11:55			27 Feb 2019 15:39	1
HS19020370-02	L-2	05 Feb 2019 10:15			27 Feb 2019 15:39	1
HS19020370-03	L-3	05 Feb 2019 10:55			27 Feb 2019 15:39	1
HS19020370-04	L-4	05 Feb 2019 15:15			27 Feb 2019 15:39	1
HS19020370-05	L-5	05 Feb 2019 16:20			27 Feb 2019 15:39	1
HS19020370-06	L-7	04 Feb 2019 15:30			27 Feb 2019 15:39	1
HS19020370-07	L-8	04 Feb 2019 14:40			27 Feb 2019 15:39	1
HS19020370-08	L-9	06 Feb 2019 15:05			27 Feb 2019 15:39	1
HS19020370-09	L-10	06 Feb 2019 14:07			27 Feb 2019 15:39	1
HS19020370-10	L-11	05 Feb 2019 14:00			27 Feb 2019 15:39	1
HS19020370-11	L-12	04 Feb 2019 13:25			27 Feb 2019 15:39	1
HS19020370-12	L-13	05 Feb 2019 12:51			27 Feb 2019 15:39	1
HS19020370-13	L-14	05 Feb 2019 12:00			27 Feb 2019 15:39	1
HS19020370-14	L-15	06 Feb 2019 13:05			27 Feb 2019 15:39	1

Client: Wood Environment & Infrastructure Solutions
Project: PCCA Turnpike 6703180051
WorkOrder: HS19020370

QC BATCH REPORT

Batch ID: 137969 **Instrument: TOC_03** **Method: SW9060**

MBLK Sample ID: **MBLK-137969** Units: **wt%-dry** Analysis Date: **23-Feb-2019 10:30**
Client ID: Run ID: **TOC_03_333387** SeqNo: **4961530** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Organic Carbon	U	0.0600								

LCS Sample ID: **LCS-137969** Units: **wt%-dry** Analysis Date: **23-Feb-2019 10:30**
Client ID: Run ID: **TOC_03_333387** SeqNo: **4961529** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Organic Carbon	29	0.0600	30	0	96.6	80 - 120				

MS Sample ID: **HS19020370-02MS** Units: **wt%-dry** Analysis Date: **23-Feb-2019 10:30**
Client ID: **L-2** Run ID: **TOC_03_333387** SeqNo: **4961527** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Organic Carbon	7.866	0.0600	10	0.475	73.9	80 - 120				S

MSD Sample ID: **HS19020370-02MSD** Units: **wt%-dry** Analysis Date: **23-Feb-2019 10:30**
Client ID: **L-2** Run ID: **TOC_03_333387** SeqNo: **4961528** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Organic Carbon	7.523	0.0600	10	0.475	70.5	80 - 120	7.866	4.46	20	S

The following samples were analyzed in this batch:

HS19020370-01	HS19020370-02	HS19020370-03	HS19020370-04
HS19020370-05	HS19020370-06	HS19020370-07	HS19020370-08
HS19020370-09	HS19020370-10	HS19020370-11	HS19020370-12
HS19020370-13	HS19020370-14		

Client:	Wood Environment & Infrastructure Solutions	**QUALIFIERS, ACRONYMS, UNITS**
Project:	PCCA Turnpike 6703180051	
WorkOrder:	**HS19020370**	

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Sample Receipt Checklist

Client Name:	Wood Austin	Date/Time Received:	**07-Feb-2019 07:30**
Work Order:	HS19020370	Received by:	**DDG**

Checklist completed by: *Raegen Giga* (eSignature) 7-Feb-2019 (Date)

Reviewed by: *Dane J. Wacasey* (eSignature) 8-Feb-2019 (Date)

Matrices: **Sediment**

Carrier name: **Greyhound**

	Yes	No	
Shipping container/cooler in good condition?	☑	☐	Not Present ☐
Custody seals intact on shipping container/cooler?	☑	☐	Not Present ☐
Custody seals intact on sample bottles?	☐	☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	Not Present ☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:198653/198652
Samplers name present on COC?	☐	☑	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	0.2c/0.5c - 0.5c/0.8c - 0.3c/0.6c uc/c	IR 25
Cooler(s)/Kit(s):	4417/23954/43777	
Date/Time sample(s) sent to storage:	02/07/2019 17:46	

	Yes	No	
Water - VOA vials have zero headspace?	☐	☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 198653

Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information	
Purchase Order	6703180051.0003	Project Name	PCCA Turnpike 6703180051
Work Order		Project Number	6703180051.0003
Company Name	Wood Environment & Infrastructure	Bill To Company	Wood Environment & Infrastructure
Send Report To	Carl Teinert	Invoice Attn	Carl Teinert
Address	3755 S. Capital of Texas Highway Ste. 375	Address	3755 S. Capital of Texas Highway Ste. 375
City/State/Zip	Austin, TX 78704	City/State/Zip	Austin TX 78704
Phone	(512) 795-0360	Phone	(512) 795-0360
Fax	(512) 795-8423	Fax	(512) 795-8423
e-Mail Address	carl.teinert@woodplc.com	e-Mail Address	carl.teinert@woodplc.com

Parameter/Method Request for Analysis

A	TOC_S (9060 TOC)
B	SUB_GRAINSIZE (ASTM D422 Grain Size (Sub TWE))
C	
D	
E	
F	
G	
H	
I	
J	

HS19020370
Wood Environment & Infrastructure Solutions
PCCA Turnpike 6703180051

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	L-1	2/4/19	1155	Sediment	8	2	X	X									
2	L-2	2/5/19	1015	Sediment	8	2	X	X									
3	L-3	2/5/19	1055	Sediment	8	2	X	X									
4	L-4	2/5/19	1515	Sediment	8	2	X	X									
5	L-5	2/5/19	1620	Sediment	8	2	X	X									
6	L-6 NO SAMPLE CT	X	X	~~Sediment~~	~~8~~	~~2~~ CT	~~X~~	~~X~~									
7	L-7	2/4/19	1530	Sediment	8	2	X	X									
8	L-8	2/4/19	1440	Sediment	8	2	X	X									
9	L-9	2/6/19	1505	Sediment	8	2	X	X									
10	L-10	2/6/19	1407	Sediment	8	2	X	X									

Sampler(s) Please Print & Sign: CAT, SCM, AB Carl Teinert

Shipment Method: ALS / Greyhound

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other ______

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Carl Teinert	2/6/19	1900	—
Relinquished by:	Date:	Time:	Received by (Laboratory):
—			DG 2/7/19 07:30
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: PCCA Turnpike

Cooler ID	Cooler Temp.
4417	0.1 C. 0.2° #25 c/f 0.3°
23954	0.5°
43777	0.3°

QC Package: (Check One Box Below)
[ ] Level II Std QC
[ ] Level III Std QC/Raw Data
[ ] Level IV SW846/CLP
[ ] Other ______
[X] TRRP Checklist
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page 2 of 2

COC ID: 198652

ALS Project Manager: ALS Work Order #:

Customer Information		Project Information	
Purchase Order	6703180051.0003	Project Name	PCCA Turnpike 6703180051
Work Order		Project Number	6703180051.0003
Company Name	Wood Environment & Infrastructure	Bill To Company	Wood Environment & Infrastructure
Send Report To	Carl Teinert	Invoice Attn	Carl Teinert
Address	3755 S. Capital of Texas Highway Ste. 375	Address	3755 S. Capital of Texas Highway Ste. 375
City/State/Zip	Austin, TX 78704	City/State/Zip	Austin TX 78704
Phone	(512) 795-0360	Phone	(512) 795-0360
Fax	(512) 795-8423	Fax	(512) 795-8423
e-Mail Address	carl.teinert@woodplc.com	e-Mail Address	carl.teinert@woodplc.com

Parameter/Method Request for Analysis

- A TOC_S (9060 TOC)
- B SUB_GRAINSIZE (ASTM D422 Grain Size (Sub TWE))
- C
- D
- E
- F
- G
- H
- I
- J

HS19020370
Wood Environment & Infrastructure Solutions
PCCA Turnpike 6703180051

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	L-11	2/5/19	1400	Sediment	8	2	X	X									
2	L-12	2/6/19	1325	Sediment	8	2	X	X									
3	L-13	2/5/19	1251	Sediment	8	2	X	X									
4	L-14	2/5/19	1200	Sediment	8	2	X	X									
5	L-15	2/6/19	1305	Sediment	8	2	X	X									
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: CAT, SCM, AB [signature]

Shipment Method: ALS / Greyhound

Required Turnaround Time: (Check Box) ☐ Other ____ ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: [signature]	Date: 2/6/19	Time: 1900	Received by:
Relinquished by:	Date:	Time:	Received by (Laboratory): DG 2/7/19 07:30
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: PCCA Turnpike

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
☐ Level II Std QC ☒ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 2/6/19 Time: 1900
Name:
Company: WOOD

Seal Broken By: RH
Date: 2/7/19

06FEB19 07:27P ** LABEL **

Schd: VLP 0854

GLI 3086408919

HOUSTON, TX

ALS DALLAS
281-530-5656

ALS GLOBAL DALLAS
10450 STANCLIFF RD

HOUSTON, TX 77099
Phone: 281-530-5656
Priority

Manual Wght:
109.0
Tariff Wght:
109.0

PO/Ref #:

Agency Phone: (713)759-6550 WWW.SHIPGREYHOUND.COM

CUSTODY SEAL

Time: 1900
Company: WOOD

Seal Broken By: RH
Date: 2/7/19

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date:
Name:
Company:

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date:
Name:
Company:

CUSTODY SEAL

Time: 1900
WOOD

Seal Broken By: RH
Date: 2/7/19

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 2/6/19 Time: 1900
Name: [illegible]
Company: [illegible]

Seal Broken By: RG
Date: 2/7/19

06FEB19 07:27P ** LABEL **

Schd: VLP 0854

GLI 3086408919

HOUSTON, TX

ALS DALLAS
281-530-5656

ALS GLOBAL DALLAS
10450 STANCLIFF RD

HOUSTON, TX 77099
Phone: 281-530-5656
Priority
Agency Phone: (713)759-6550

Manual Wght:
109.0
Tariff Wght:
109.0

PO/Ref #:

WWW.SHIPGREYHOUND.COM

DRAFT

06FEB19 07:27P ** LABEL **

Schd: VLP 0854

GLI 3086408919

HOUSTON, TX

a: ALS DALLAS
281-530-5656

7: ALS GLOBAL DALLAS
10450 STANCLIFF RD

HOUSTON, TX 77099
Phone: 281-530-5656
Pric

Manual Wght:
109.0
Tariff Wght:
109.0

PO/Ref #:

Age... 759-6550 WWW.SHIPGREYHOUND.COM

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 2/6/19 Time: 1900
Name:
Company:
Seal Broken By:
Date: 2/7/19

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date:
Name:
Company:

CUSTODY SEAL
Time: 1900
Wood
Seal Broken By:
Date: 2/7/19

Tolunay-Wong Engineers, Inc.

10710 S. Sam Houston Parkway W., Suite 100 * Houston, TX 77031 * Phone (713) 722-7064 * Fax (713) 722-0319

Mr. Dane Wacasey
ALS
450 Stancliff Rd, Ste 210
Houston, TX 77099

February 22, 2019
TWE Project No. 19.14.025
Clients Chain of Custody Number: 10715
Clients Purchase Order Number: HS19020370

Re: Laboratory Test Results

Dear Mr. Wacasey:

Attached are the results of the laboratory testing performed on the samples delivered to our laboratory in Houston, Texas on February 8, 2019 for the subject project.

The testing consisted of 14 hydrometer analyses.

D-422 was withdrawn by ASTM in 2016 and has not been reinstated or replaced.

We hope this report satisfies your testing requirements at this time. The invoice will be sent separately.

We thank you for the opportunity to serve you, and look forward to working with you on future projects.

Sincerely,
TOLUNAY- WONG ENGINEERS, INC.

Patricia Hodgkins

Patricia Hodgkins
Geotechnical Laboratory Manager

Encl:
Customer Survey (1)
Clients Chain of Custody (2)
Hydrometer & Sieve Report (42)

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 10715

19.14.025

include GEO system printout w/report to client

SUBCONTRACT TO:

Tolunay-Wong
10710 S. Sam Houston Parkway WestSuite 100
Houston, TX 77031

Phone: +1 713 722 7064

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Dane J. Wacasey
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	Dane.Wacasey@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19020370
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19020370-01**	**L-1**	**Sediment**	**04 Feb 2019 11:55**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
2.	**HS19020370-02**	**L-2**	**Sediment**	**05 Feb 2019 10:15**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
3.	**HS19020370-03**	**L-3**	**Sediment**	**05 Feb 2019 10:55**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
4.	**HS19020370-04**	**L-4**	**Sediment**	**05 Feb 2019 15:15**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
5.	**HS19020370-05**	**L-5**	**Sediment**	**05 Feb 2019 16:20**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
6.	**HS19020370-06**	**L-7**	**Sediment**	**04 Feb 2019 15:30**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
7.	**HS19020370-07**	**L-8**	**Sediment**	**04 Feb 2019 14:40**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
8.	**HS19020370-08**	**L-9**	**Sediment**	**06 Feb 2019 15:05**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
9.	**HS19020370-09**	**L-10**	**Sediment**	**06 Feb 2019 14:07**

Subcontract Chain of Custody

COC ID: 10715

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
10.	**HS19020370-10**	**L-11**	**Sediment**	**05 Feb 2019 14:00**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
11.	**HS19020370-11**	**L-12**	**Sediment**	**04 Feb 2019 13:25**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
12.	**HS19020370-12**	**L-13**	**Sediment**	**05 Feb 2019 12:51**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
13.	**HS19020370-13**	**L-14**	**Sediment**	**05 Feb 2019 12:00**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019
14.	**HS19020370-14**	**L-15**	**Sediment**	**06 Feb 2019 13:05**
	D422-63; Sieve+Hydrom; Need D50 values, 10 day TAT			21 Feb 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

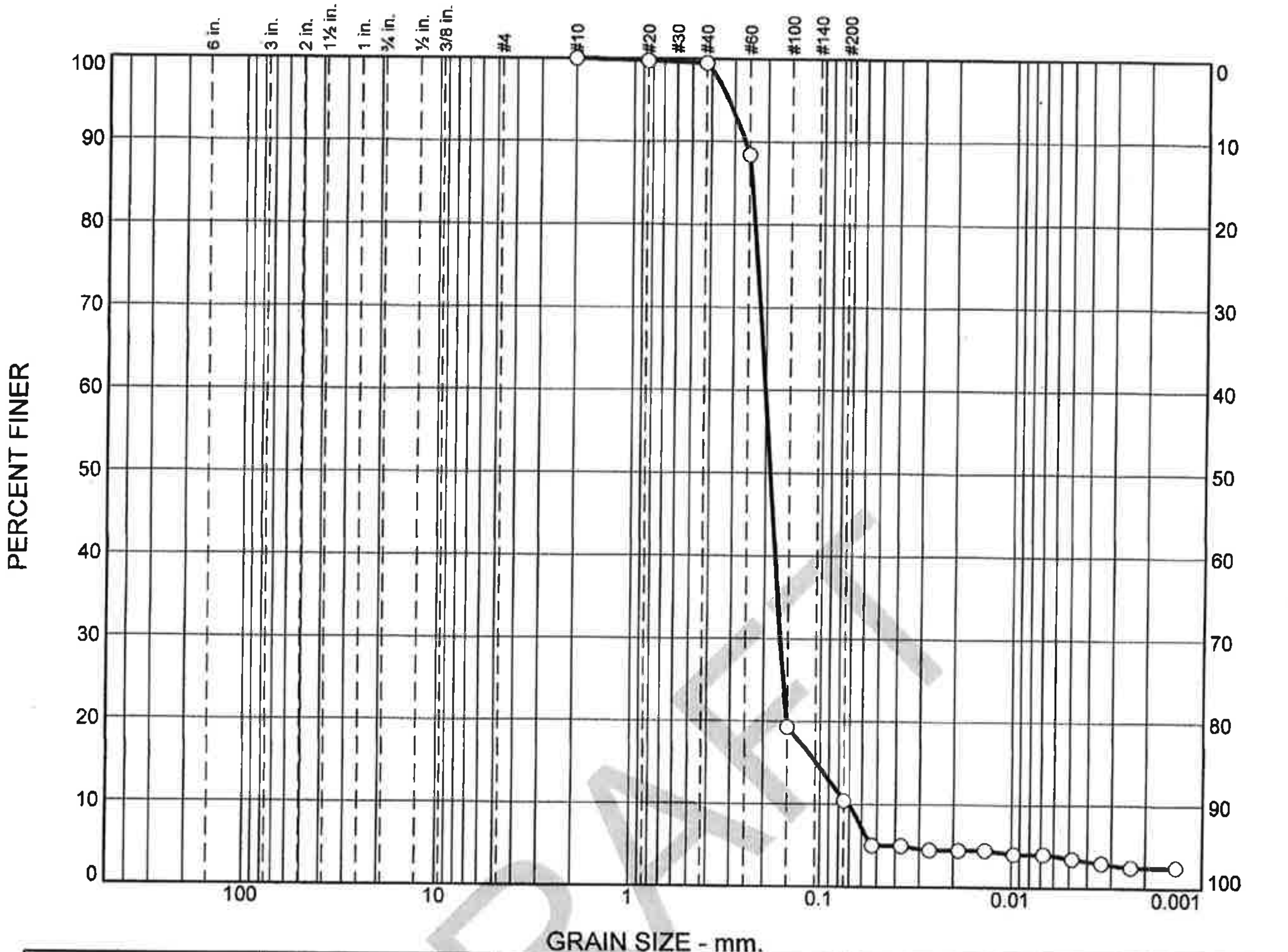
QC Level: TRRP LRC (TRRP checklist only+Level II (normal))

Relinquished By: DD Date/Time: 2.8.19 1140

Received By: ______ Date/Time: ______

Cooler ID(s): ______ Temperature(s): ______

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.5	89.1	7.9	2.5

SOIL DATA

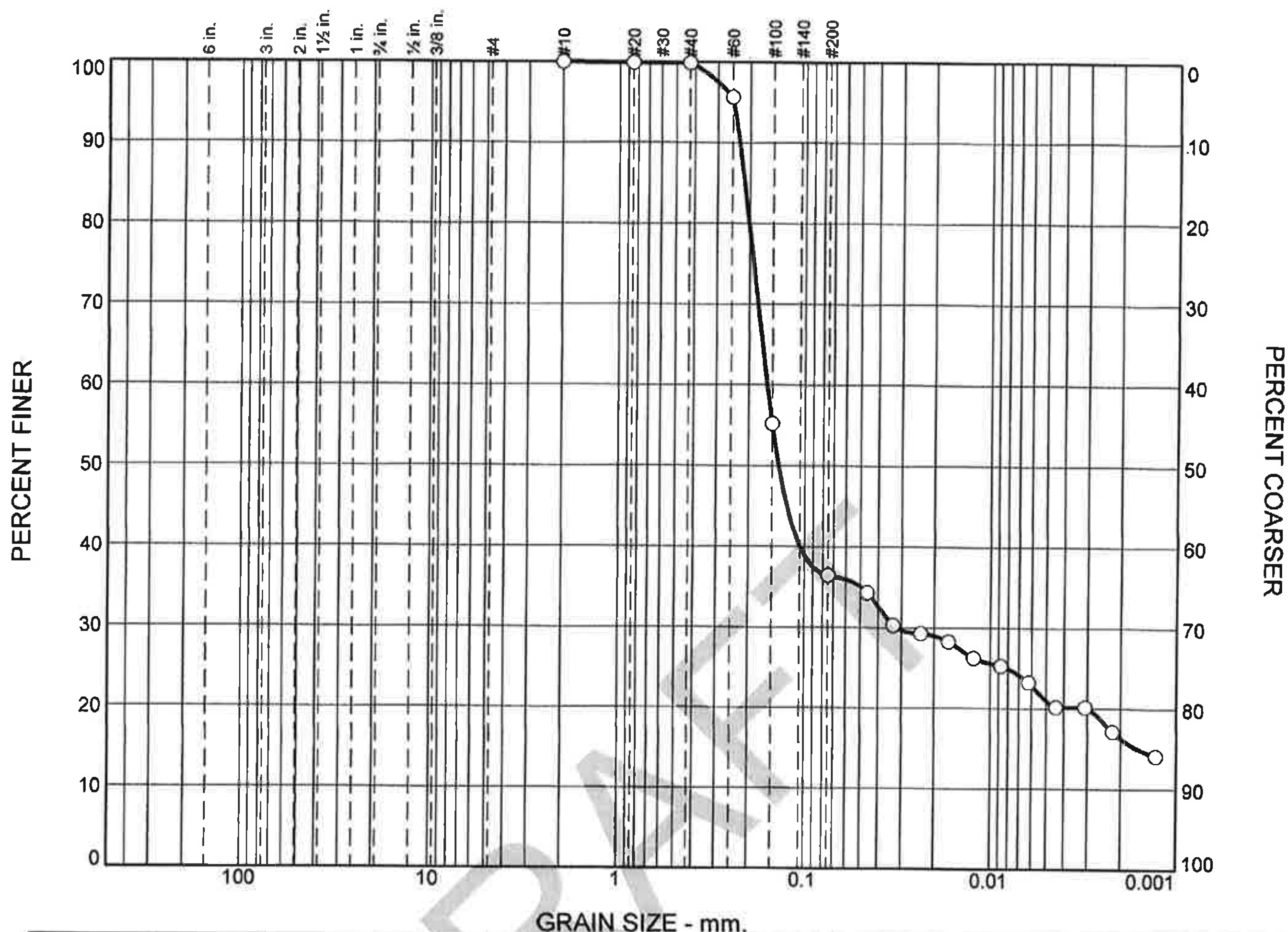
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	01-L1			SP-SM

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025

Figure

ASTM D422



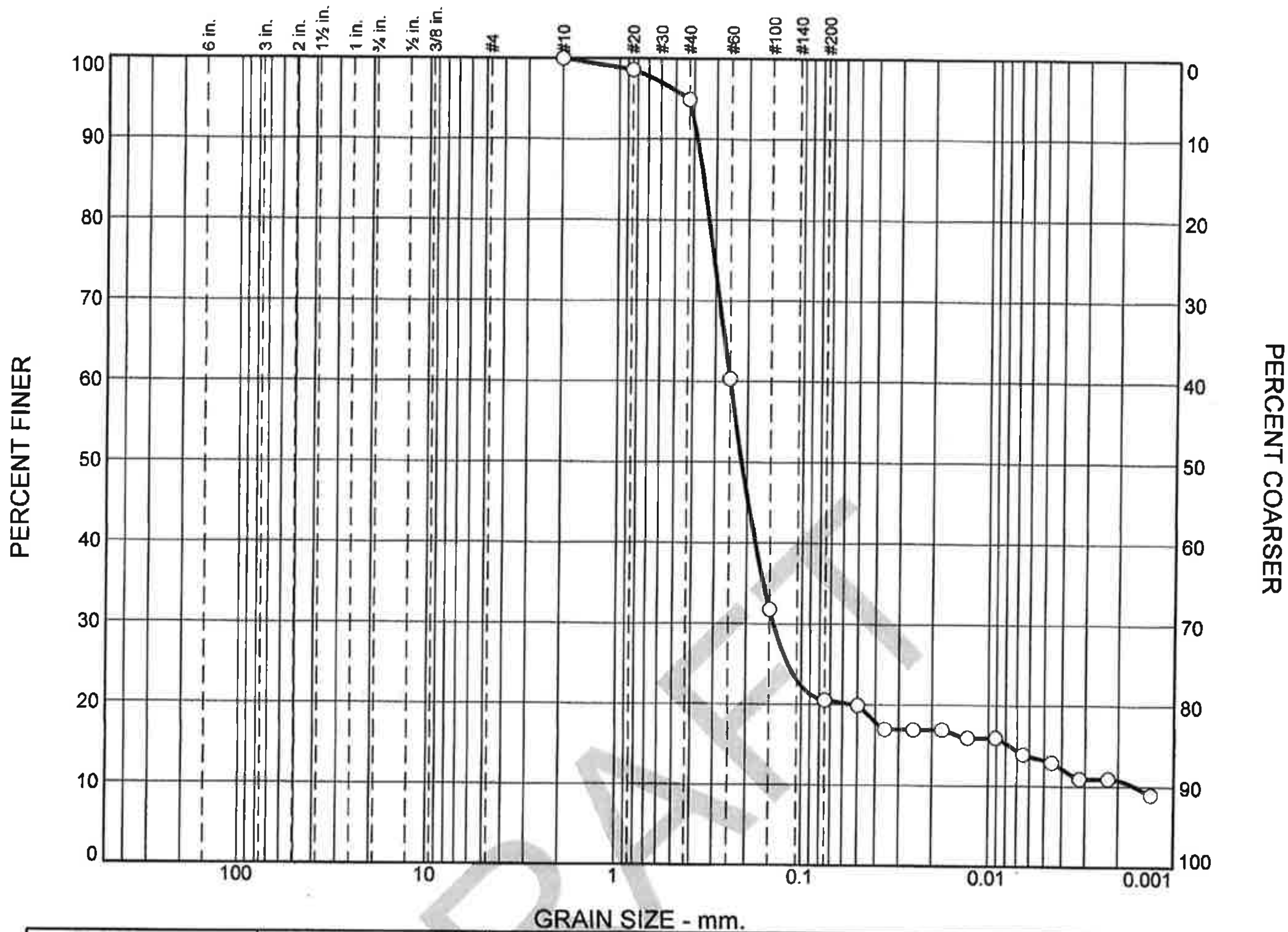
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	63.4	20.2	16.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	02-L2			SC

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** ALS **Project:** ALS HS19020370 **Project No.:** 19.14.025 **Figure**

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	5.1	74.3	9.8	10.8

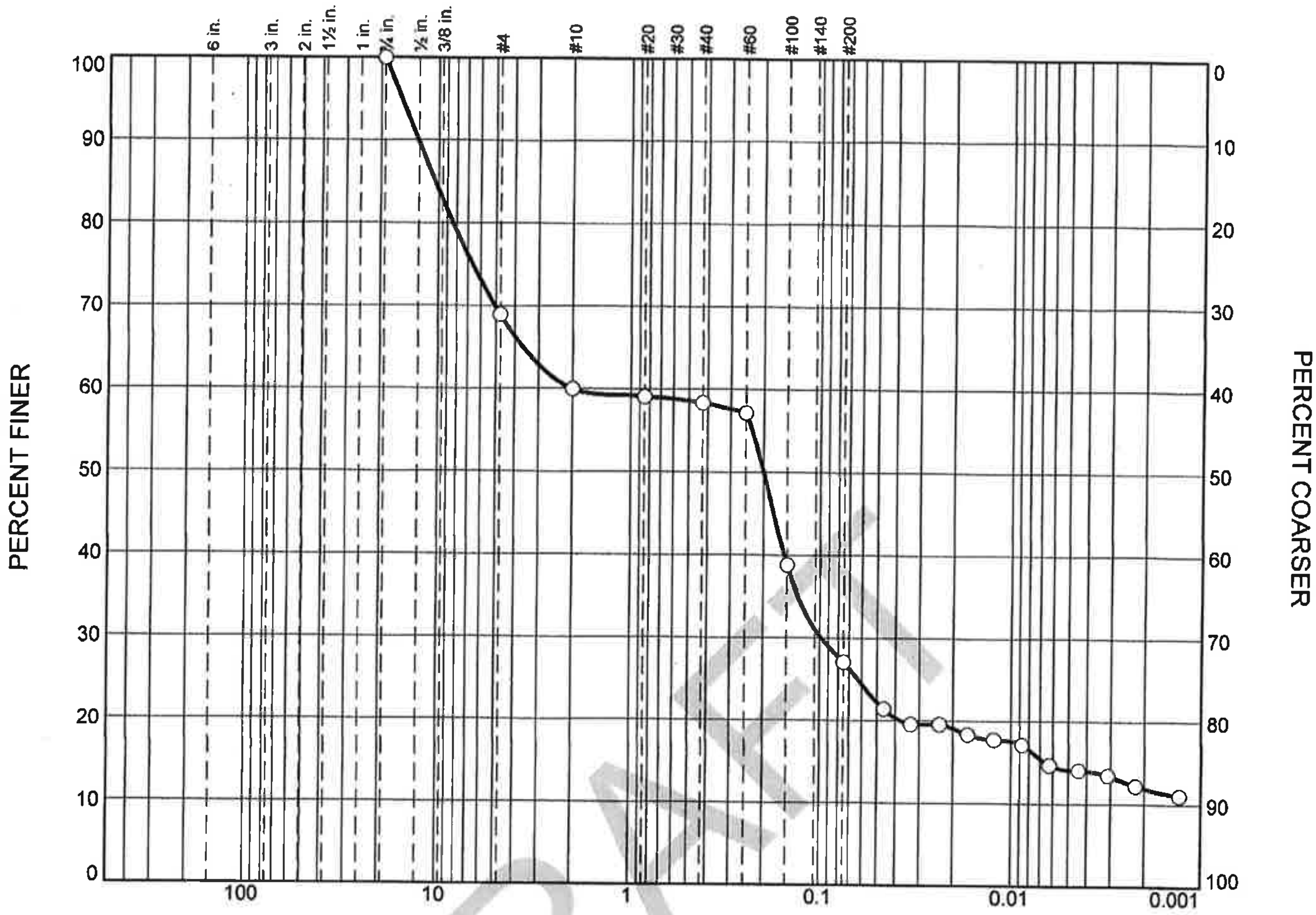
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	03-L3			ML

Tolunay-Wong Engineers, Inc. Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025 **Figure**

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	31.1	8.9	1.7	31.2	15.2	11.9

SOIL DATA

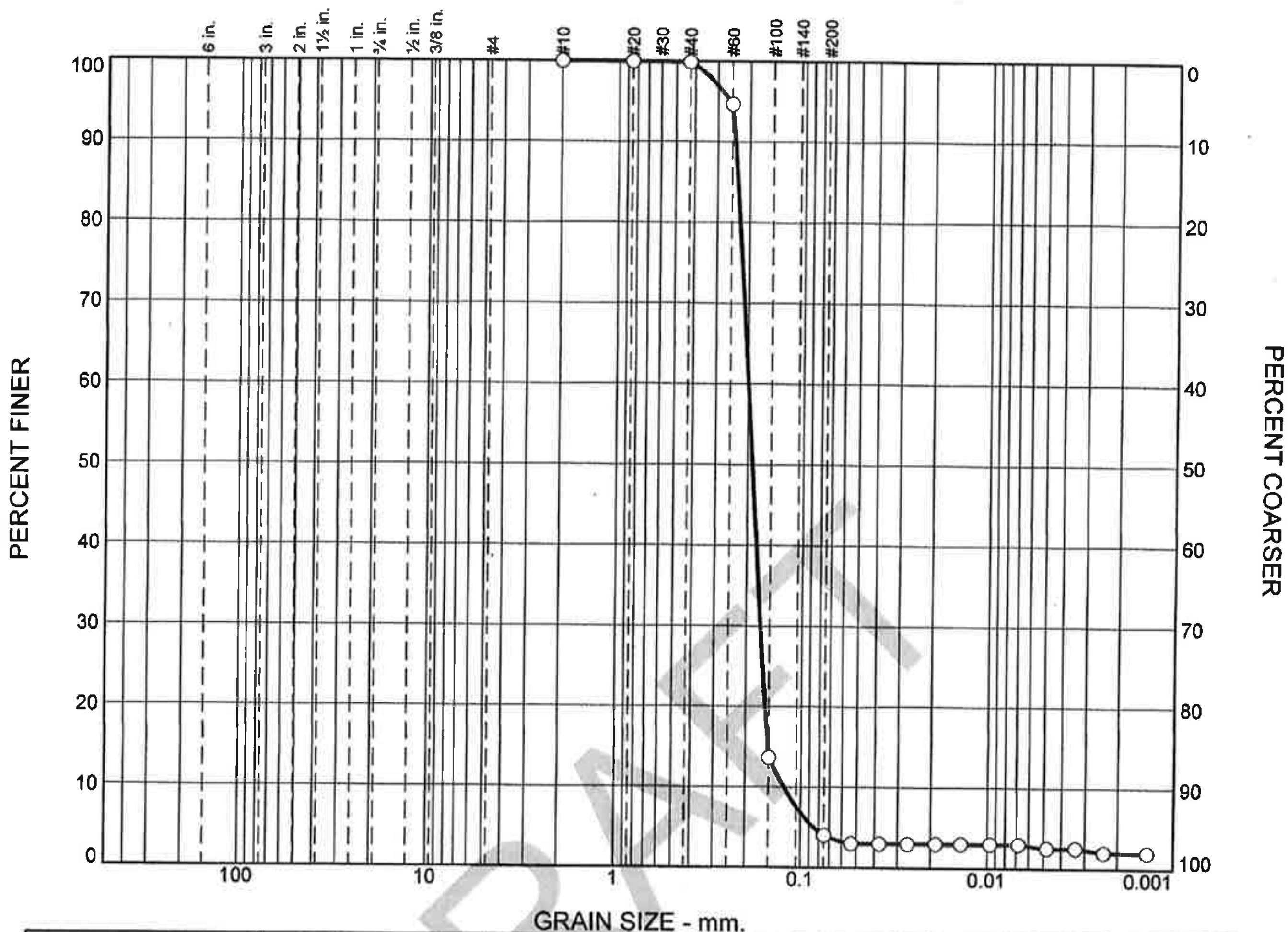
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	04-L4			SC

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025

Figure

ASTM D422



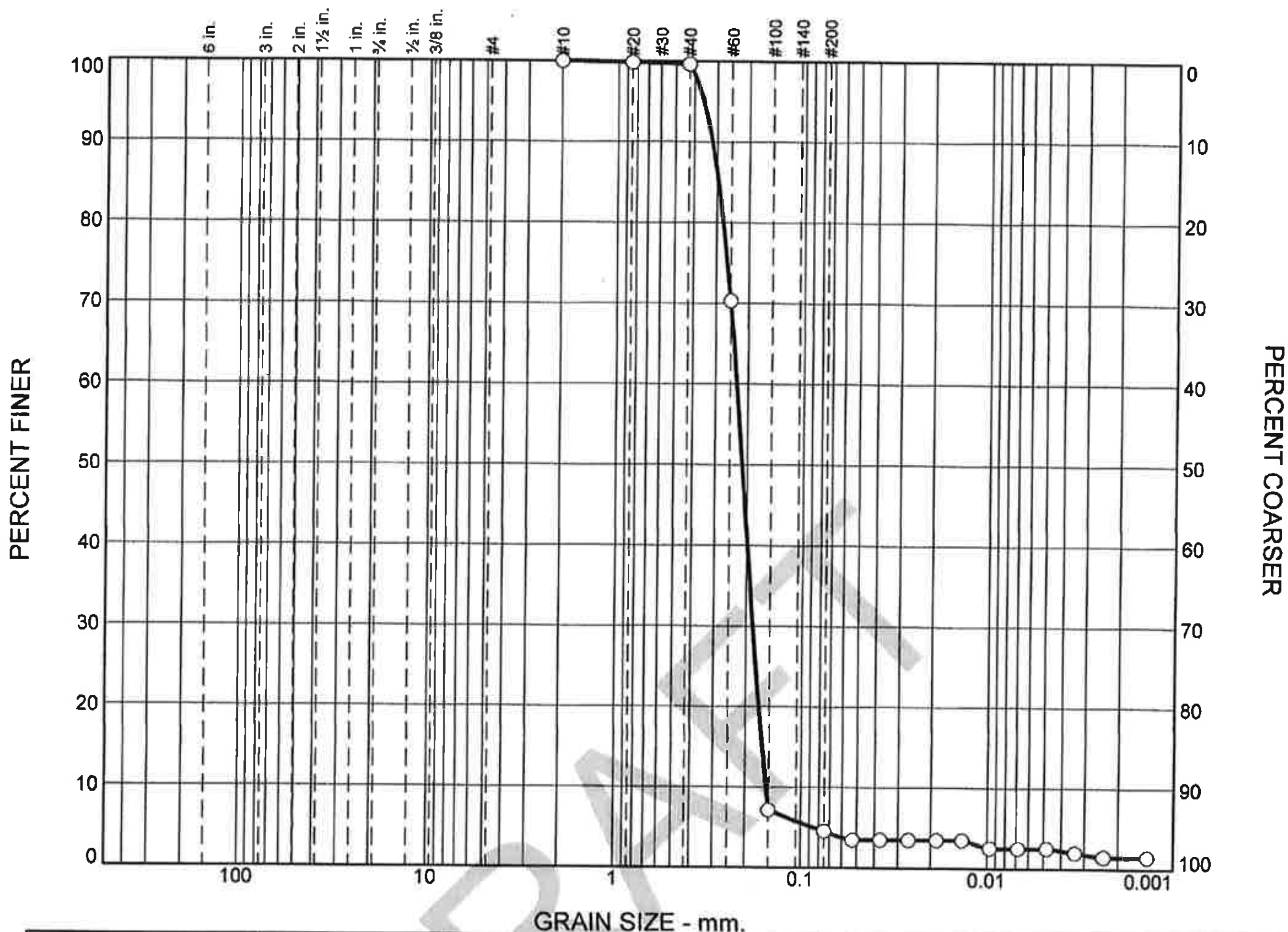
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	95.9	2.0	2.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	05-L5			SP

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** ALS **Project:** ALS HS19020370 **Project No.:** 19.14.025 **Figure**

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	95.0	3.1	1.5

SOIL DATA

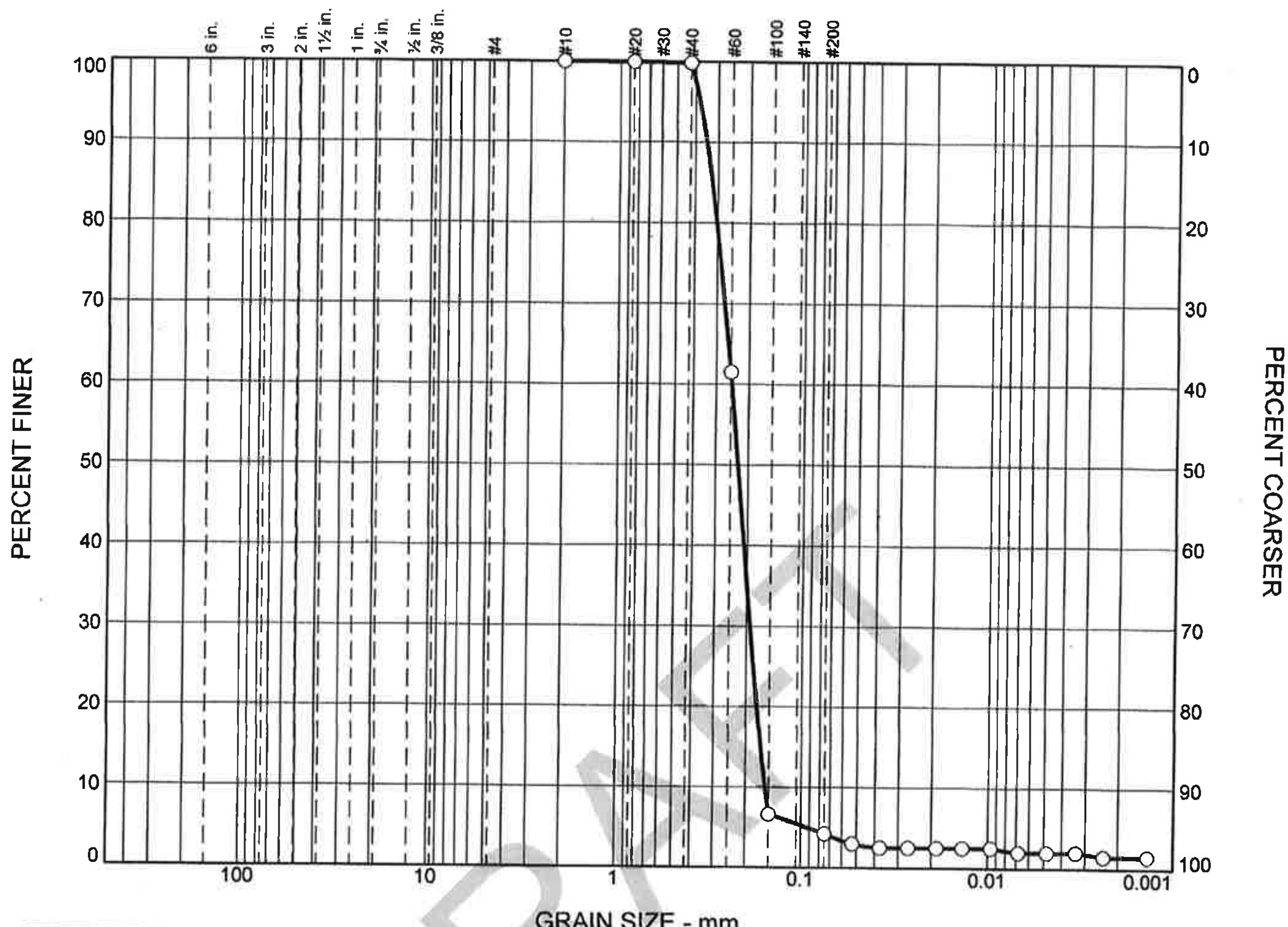
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	06-L7			SP

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025

Figure

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	95.6	2.7	1.5

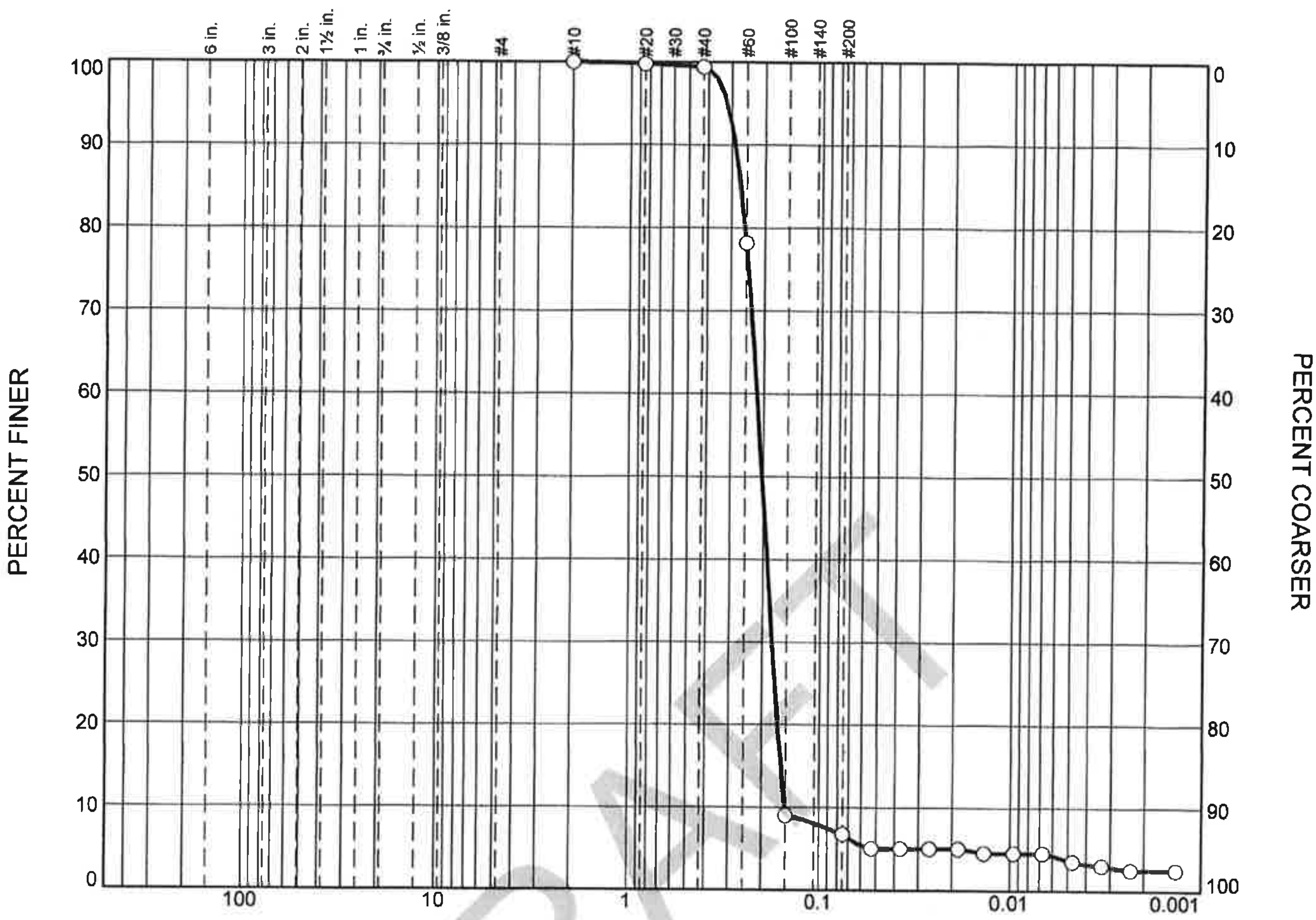
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	07-L8			SP

Tolunay-Wong Engineers, Inc. Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025
Figure

ASTM D422



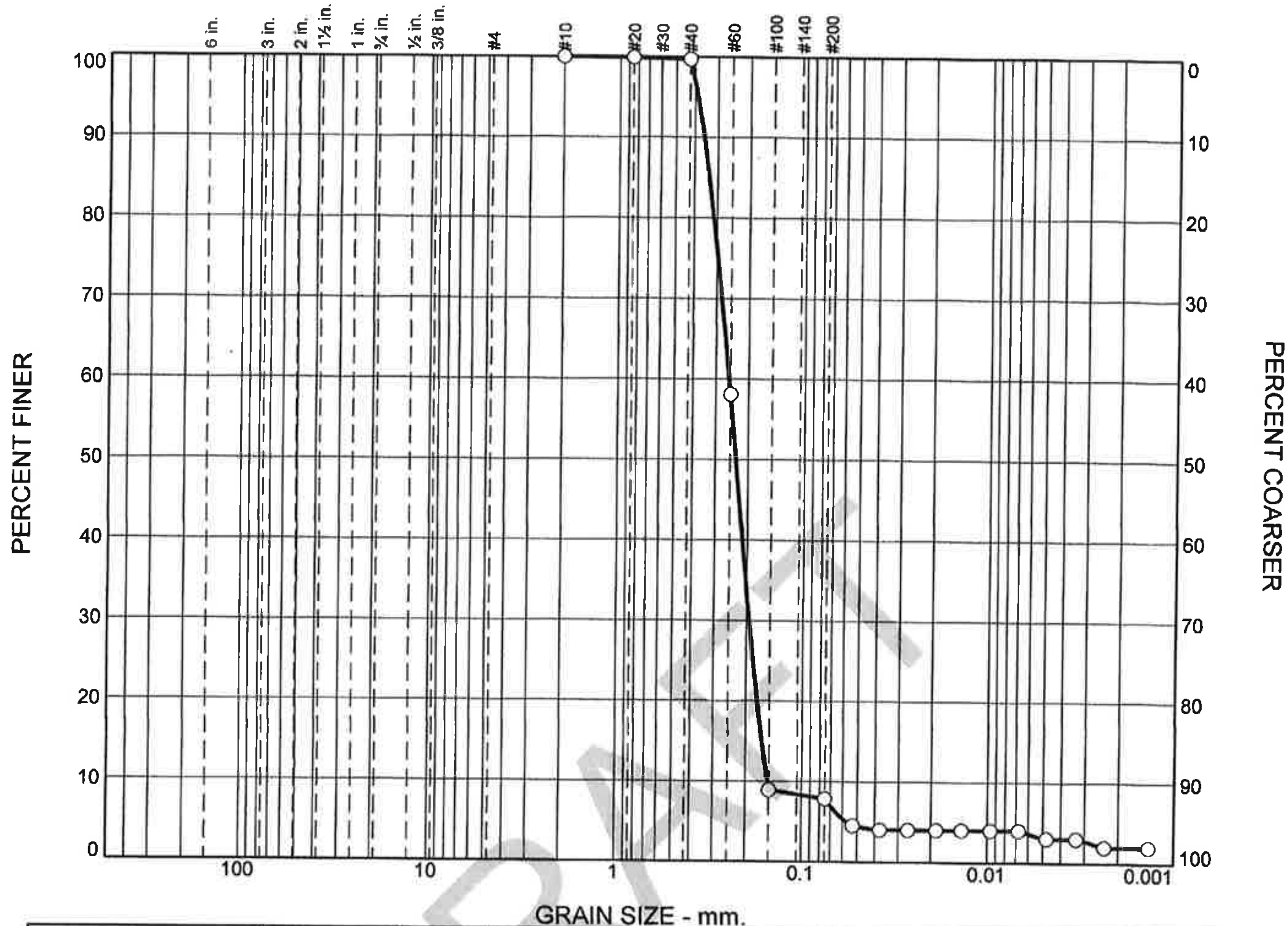
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.6	92.7	4.2	2.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	08-L9			SP-SM

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** ALS **Project:** ALS HS19020370 **Project No.:** 19.14.025 **Figure**

ASTM D422



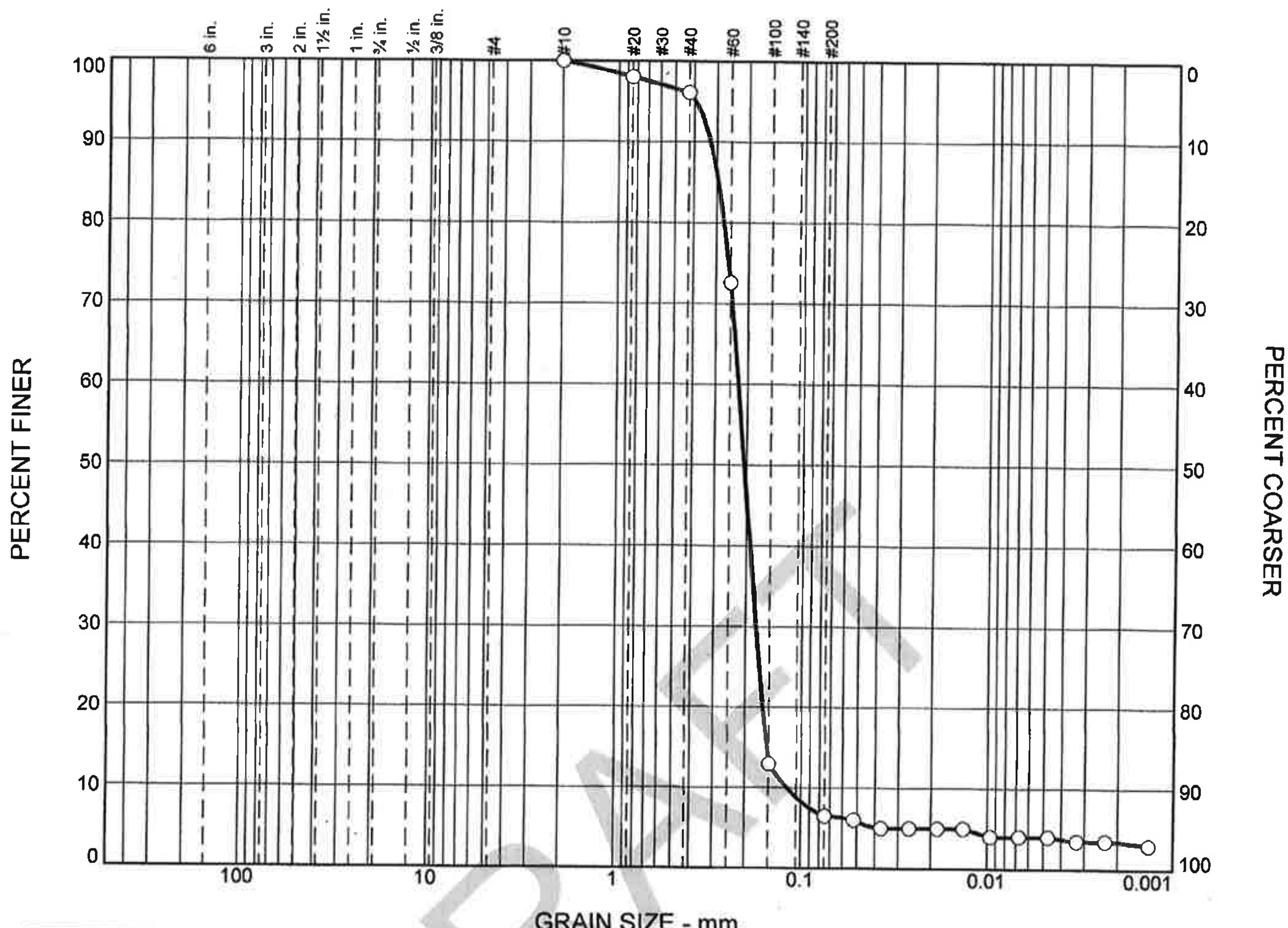
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○					0.3	91.8	5.9	2.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	09-L10			SP-SM

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** ALS **Project:** ALS HS19020370 **Project No.:** 19.14.025 **Figure**

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.9	89.6	3.0	3.5

SOIL DATA

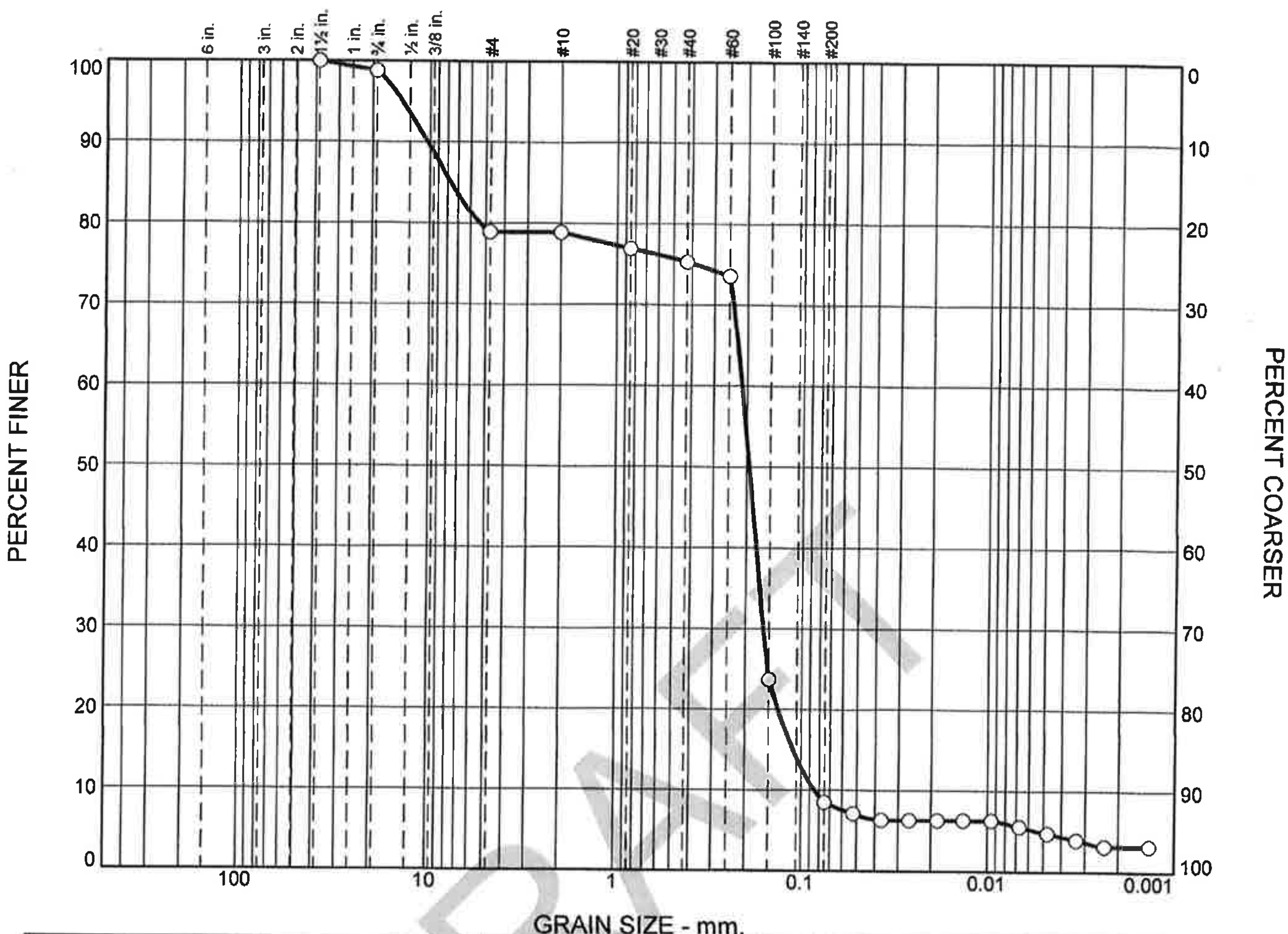
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	010-L11			SP-SM

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025

Figure

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	1.2	19.9	0.0	3.6	66.8	5.3	3.2

SOIL DATA

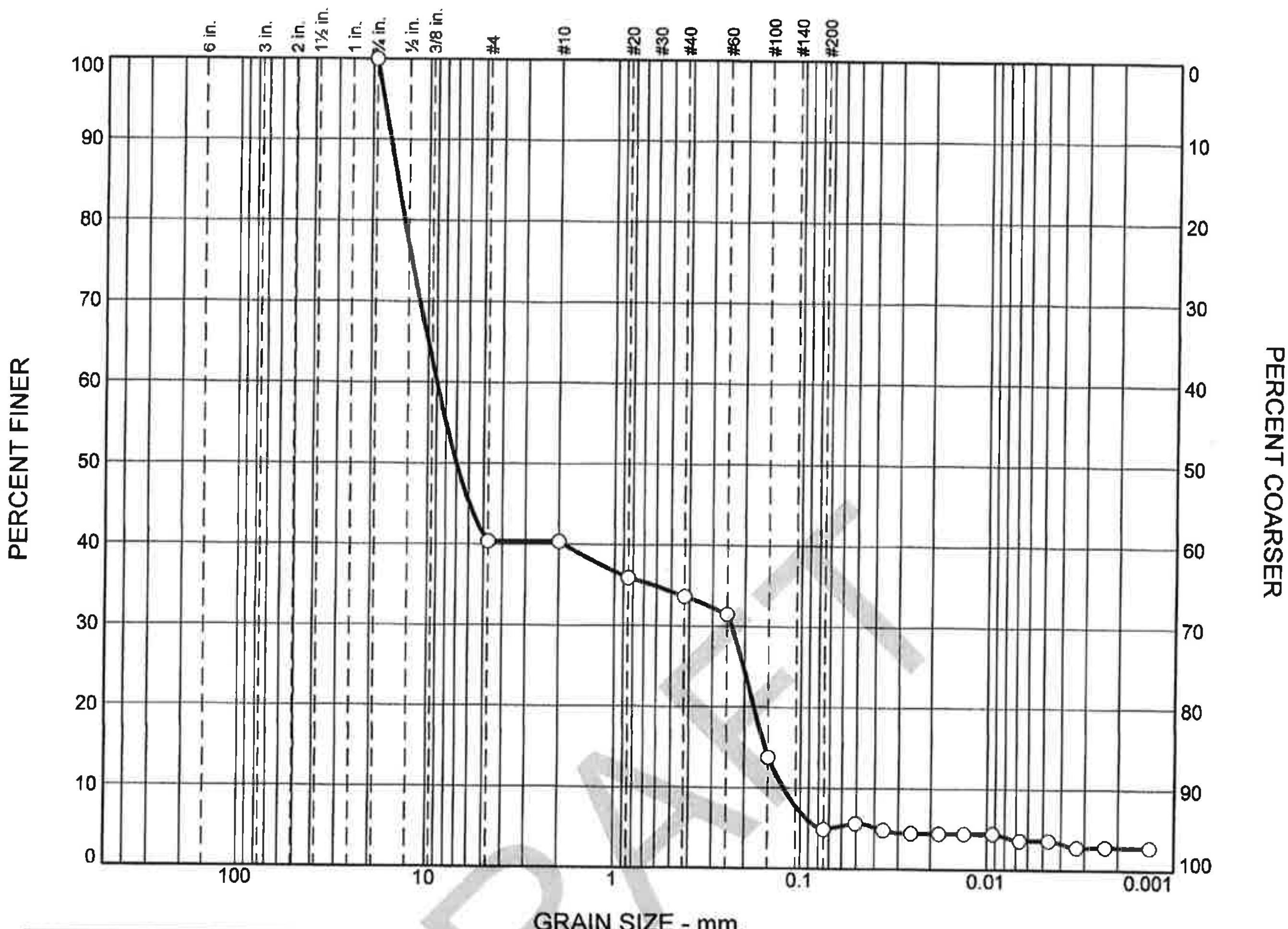
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	011-L12			SP-SM

Tolunay-Wong Engineers, Inc. Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025

Figure

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	59.6	0.0	6.8	28.7	2.1	2.8

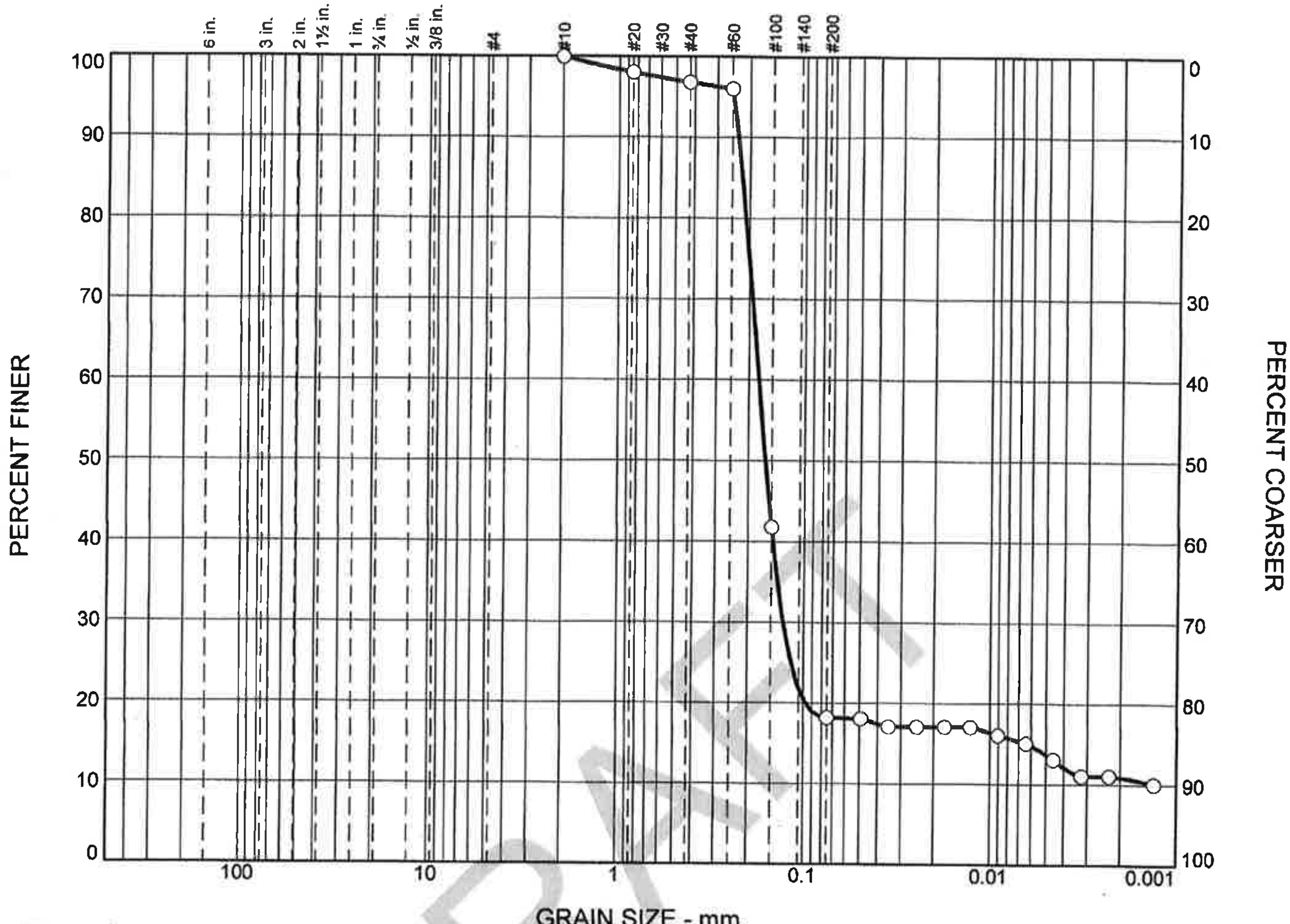
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	012-L13			GP

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: T9.14.025
Figure

ASTM D422



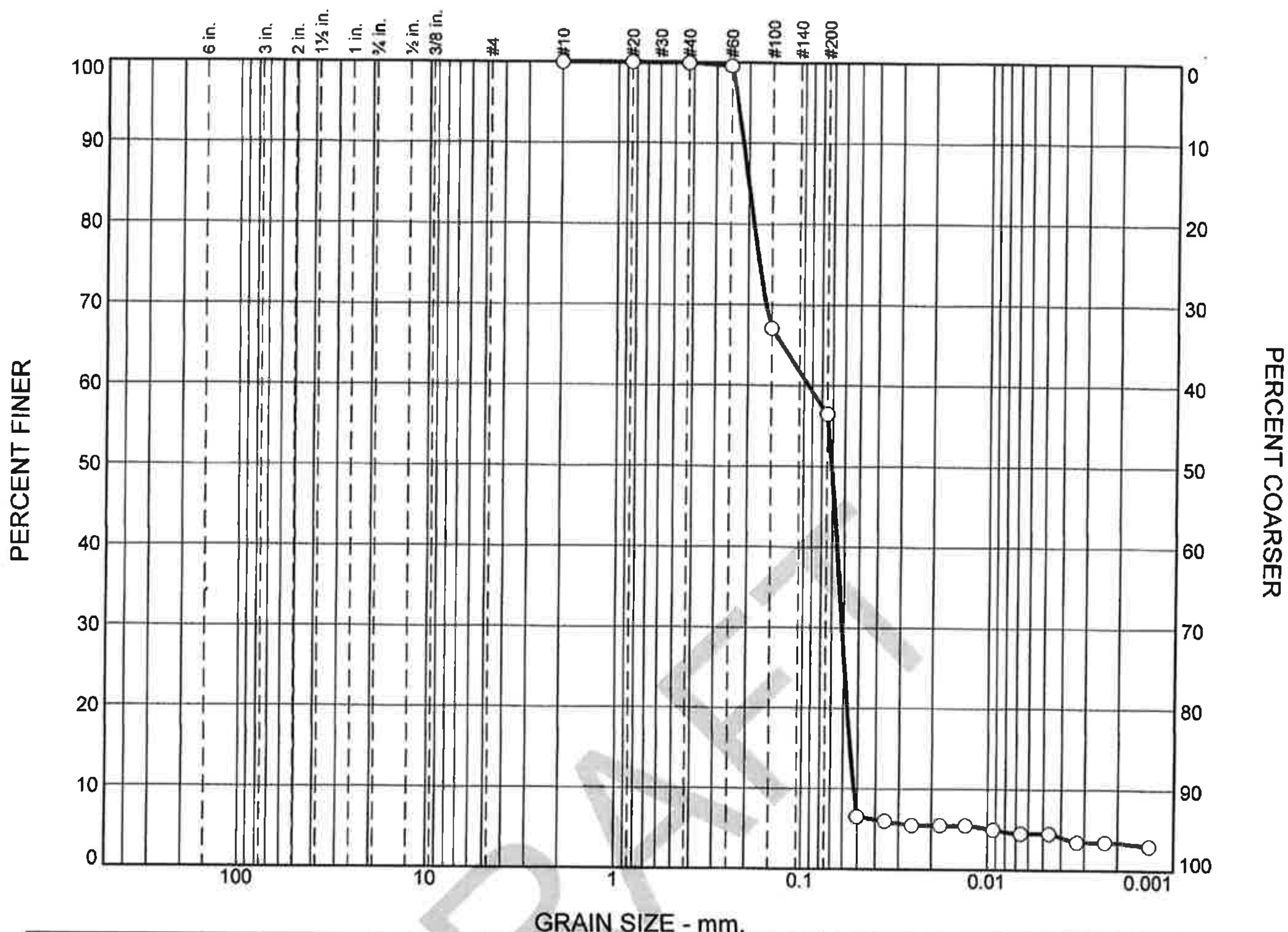
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○					3.2	78.6	7.3	10.9

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	013-L14			SC

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** ALS **Project:** ALS HS19020370 **Project No.:** 19.14.025 **Figure**

ASTM D422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○					0.1	43.4	53.1	3.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	HS19020370	014-L15			ML

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: ALS
Project: ALS
HS19020370
Project No.: 19.14.025
Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 01-L1
USCS: SP-SM

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
318.50	218.50	218.50	#10	218.50	100.0	0.0
			#20	218.76	99.7	0.3
			#40	219.01	99.5	0.5
			#60	230.10	88.4	11.6
			#100	299.17	19.3	80.7
			#200	308.11	10.4	89.6

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 118.85
Dry weight and tare = 118.74
Tare weight = 30.62
Hygroscopic moisture = 0.1%
Table of composite correction values:

Temp., deg. C:	15.0	18.4
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	15.0	11.0	5.0	0.0145	11.5	13.3	0.0530	5.0	95.0
2.00	15.0	11.0	5.0	0.0145	11.5	13.3	0.0374	5.0	95.0
4.00	15.1	10.5	4.5	0.0145	11.0	13.4	0.0266	4.5	95.5
8.00	15.2	10.5	4.5	0.0145	11.0	13.4	0.0188	4.5	95.5
15.00	15.2	10.5	4.5	0.0145	11.0	13.4	0.0137	4.5	95.5
30.00	15.5	10.0	4.0	0.0145	10.5	13.5	0.0097	4.0	96.0
60.00	16.1	10.0	4.0	0.0143	10.5	13.5	0.0068	4.0	96.0
120.00	16.6	9.5	3.5	0.0142	10.0	13.6	0.0048	3.5	96.5
240.00	17.6	9.0	3.0	0.0141	9.5	13.8	0.0034	3.0	97.0
480.00	18.4	8.5	2.5	0.0139	9.0	13.9	0.0024	2.5	97.5
1440.00	17.8	8.5	2.5	0.0140	9.0	13.9	0.0014	2.5	97.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.5	89.1	89.6	7.9	2.5	10.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0373	0.0707	0.1048	0.1510	0.1646	0.1768	0.1888	0.2015	0.2319	0.2419	0.2642	0.3240

Fineness Modulus	C_u	C_c
0.88	2.85	1.90

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 02-L2
USCS: SC

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
268.32	218.32	218.32	#10	218.32	100.0	0.0
			#20	218.37	99.9	0.1
			#40	218.39	99.9	0.1
			#60	220.50	95.6	4.4
			#100	240.71	55.2	44.8
			#200	250.08	36.5	63.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =50
Hygroscopic moisture correction:
Moist weight and tare = 93.87
Dry weight and tare = 92.53
Tare weight = 30.59
Hygroscopic moisture = 2.2%
Table of composite correction values:

Temp., deg. C:	14.5	17.9
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.70
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	14.5	23.0	17.0	0.0144	23.5	10.1	0.0458	34.4	65.6
2.00	14.5	21.0	15.0	0.0144	21.5	10.6	0.0332	30.3	69.7
4.00	14.6	20.5	14.5	0.0144	21.0	10.7	0.0236	29.3	70.7
8.00	14.6	20.0	14.0	0.0144	20.5	10.9	0.0168	28.3	71.7
15.00	15.0	19.0	13.0	0.0143	19.5	11.1	0.0123	26.3	73.7
30.00	15.3	18.5	12.5	0.0143	19.0	11.3	0.0087	25.3	74.7
60.00	15.8	17.5	11.5	0.0142	18.0	11.5	0.0062	23.2	76.8
120.00	16.6	16.0	10.0	0.0140	16.5	11.9	0.0044	20.2	79.8
240.00	17.8	16.0	10.0	0.0138	16.5	11.9	0.0031	20.2	79.8
480.00	17.9	14.5	8.5	0.0138	15.0	12.3	0.0022	17.2	82.8
1440.00	17.9	13.0	7.0	0.0138	13.5	12.7	0.0013	14.1	85.9

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	63.4	63.5	20.2	16.3	36.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0016	0.0030	0.0319	0.1061	0.1381	0.1598	0.2011	0.2134	0.2280	0.2469

Fineness Modulus
0.47

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 03-L3
USCS: ML

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
265.48	215.48	215.48	#10	215.48	100.0	0.0
			#20	216.19	98.6	1.4
			#40	218.02	94.9	5.1
			#60	235.31	60.3	39.7
			#100	249.58	31.8	68.2
			#200	255.19	20.6	79.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =50
Hygroscopic moisture correction:
Moist weight and tare = 119.10
Dry weight and tare = 118.37
Tare weight = 31.60
Hygroscopic moisture = 0.8%
Table of composite correction values:

Temp., deg. C:	14.6	18.3
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.70
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	14.6	16.0	10.0	0.0144	16.5	11.9	0.0498	19.9	80.1
2.00	14.6	14.5	8.5	0.0144	15.0	12.3	0.0358	17.0	83.0
4.00	14.8	14.5	8.5	0.0144	15.0	12.3	0.0252	17.0	83.0
8.00	14.9	14.5	8.5	0.0144	15.0	12.3	0.0178	17.0	83.0
15.00	15.3	14.0	8.0	0.0143	14.5	12.5	0.0130	16.0	84.0
30.00	15.7	14.0	8.0	0.0142	14.5	12.5	0.0092	16.0	84.0
60.00	16.0	13.0	7.0	0.0141	13.5	12.7	0.0065	14.0	86.0
120.00	16.9	12.5	6.5	0.0140	13.0	12.9	0.0046	13.0	87.0
240.00	18.0	11.5	5.5	0.0138	12.0	13.1	0.0032	11.0	89.0
480.00	18.3	11.5	5.5	0.0137	12.0	13.1	0.0023	11.0	89.0
1440.00	17.9	10.5	4.5	0.0138	11.0	13.4	0.0013	9.0	91.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	5.1	74.3	79.4	9.8	10.8	20.6

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0016	0.0077	0.0516	0.1426	0.1801	0.2143	0.2488	0.3274	0.3528	0.3836	0.4300

Fineness Modulus	C_u	C_c
0.98	153.91	50.58

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 04-L4
USCS: SC

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
411.38	268.26	268.26	.75	268.26	100.0	0.0
			#4	312.75	68.9	31.1
			#10	325.52	60.0	40.0
265.73	215.73	215.73	#20	216.50	59.1	40.9
			#40	217.11	58.3	41.7
			#60	218.07	57.2	42.8
			#100	233.39	38.8	61.2
			#200	243.17	27.1	72.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 60.0
Weight of hydrometer sample =50
Hygroscopic moisture correction:
Moist weight and tare = 106.55
Dry weight and tare = 105.03
Tare weight = 30.61
Hygroscopic moisture = 2.0%
Table of composite correction values:

Temp., deg. C:	15.6	18.2
Comp. corr.:	-6.0	-6.0

Meniscus correction only = -0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	15.6	23.5	17.5	0.0144	23.0	10.2	0.0461	21.4	78.6
2.00	15.6	22.0	16.0	0.0144	21.5	10.6	0.0332	19.6	80.4
4.00	15.6	22.0	16.0	0.0144	21.5	10.6	0.0235	19.6	80.4
8.00	15.7	21.0	15.0	0.0144	20.5	10.9	0.0168	18.4	81.6
15.00	15.9	20.5	14.5	0.0144	20.0	11.0	0.0123	17.8	82.2
30.00	16.0	20.0	14.0	0.0144	19.5	11.1	0.0087	17.1	82.9
60.00	16.7	18.0	12.0	0.0142	17.5	11.7	0.0063	14.7	85.3
120.00	17.3	17.5	11.5	0.0141	17.0	11.8	0.0044	14.1	85.9
240.00	18.0	17.0	11.0	0.0140	16.5	11.9	0.0031	13.5	86.5
480.00	18.2	16.0	10.0	0.0140	15.5	12.2	0.0022	12.2	87.8
1440.00	18.0	15.0	9.0	0.0140	14.5	12.5	0.0013	11.0	89.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	31.1	31.1	8.9	1.7	31.2	41.8	15.2	11.9	27.1

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0066	0.0378	0.0982	0.1553	0.1999	2.0042	8.3806	10.4155	12.8039	15.6407

Fineness Modulus
2.73

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 05-L5
USCS: SP

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
316.30	216.30	216.30	#10	216.30	100.0	0.0
			#20	216.36	99.9	0.1
			#40	216.43	99.9	0.1
			#60	221.63	94.7	5.3
			#100	302.61	13.7	86.3
			#200	312.27	4.0	96.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 120.13
Dry weight and tare = 119.94
Tare weight = 31.27
Hygroscopic moisture = 0.2%
Table of composite correction values:

Temp., deg. C:	16.1	18.6
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	16.1	9.0	3.0	0.0143	9.5	13.8	0.0532	3.0	97.0
2.00	16.1	9.0	3.0	0.0143	9.5	13.8	0.0376	3.0	97.0
4.00	16.2	9.0	3.0	0.0143	9.5	13.8	0.0266	3.0	97.0
8.00	16.2	9.0	3.0	0.0143	9.5	13.8	0.0188	3.0	97.0
15.00	16.2	9.0	3.0	0.0143	9.5	13.8	0.0137	3.0	97.0
30.00	16.6	9.0	3.0	0.0142	9.5	13.8	0.0097	3.0	97.0
60.00	16.9	9.0	3.0	0.0142	9.5	13.8	0.0068	3.0	97.0
120.00	17.3	8.5	2.5	0.0141	9.0	13.9	0.0048	2.5	97.5
240.00	18.1	8.5	2.5	0.0140	9.0	13.9	0.0034	2.5	97.5
480.00	18.6	8.0	2.0	0.0139	8.5	14.0	0.0024	2.0	98.0
1440.00	18.0	8.0	2.0	0.0140	8.5	14.0	0.0014	2.0	98.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	95.9	96.0	2.0	2.0	4.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0848	0.1238	0.1516	0.1574	0.1680	0.1781	0.1883	0.1989	0.2237	0.2313	0.2401	0.2560

Fineness Modulus	C_u	C_c
0.89	1.61	1.15

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 06-L7
USCS: SP

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
318.31	218.31	218.31	#10	218.31	100.0	0.0
			#20	218.47	99.8	0.2
			#40	218.68	99.6	0.4
			#60	247.99	70.3	29.7
			#100	311.17	7.1	92.9
			#200	313.74	4.6	95.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 105.09
Dry weight and tare = 104.94
Tare weight = 31.33
Hygroscopic moisture = 0.2%
Table of composite correction values:

Temp., deg. C:	16.5	18.6
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	16.5	9.5	3.5	0.0143	10.0	13.6	0.0527	3.5	96.5
2.00	16.5	9.5	3.5	0.0143	10.0	13.6	0.0373	3.5	96.5
4.00	16.5	9.5	3.5	0.0143	10.0	13.6	0.0264	3.5	96.5
8.00	16.5	9.5	3.5	0.0143	10.0	13.6	0.0186	3.5	96.5
15.00	16.6	9.5	3.5	0.0142	10.0	13.6	0.0136	3.5	96.5
30.00	16.7	8.5	2.5	0.0142	9.0	13.9	0.0097	2.5	97.5
60.00	17.0	8.5	2.5	0.0142	9.0	13.9	0.0068	2.5	97.5
120.00	17.4	8.5	2.5	0.0141	9.0	13.9	0.0048	2.5	97.5
240.00	18.2	8.0	2.0	0.0140	8.5	14.0	0.0034	2.0	98.0
480.00	18.6	7.5	1.5	0.0139	8.0	14.2	0.0024	1.5	98.5
1440.00	18.1	7.5	1.5	0.0140	8.0	14.2	0.0014	1.5	98.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.4	95.0	95.4	3.1	1.5	4.6

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0853	0.1551	0.1630	0.1703	0.1843	0.1983	0.2131	0.2295	0.2760	0.2942	0.3186	0.3555

Fineness Modulus	C_u	C_c
1.07	1.48	0.95

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 07-L8
USCS: SP

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
318.45	218.45	218.45	#10	218.45	100.0	0.0
			#20	218.50	99.9	0.1
			#40	218.62	99.8	0.2
			#60	256.94	61.5	38.5
			#100	311.84	6.6	93.4
			#200	314.21	4.2	95.8

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 118.45
Dry weight and tare = 118.28
Tare weight = 30.56
Hygroscopic moisture = 0.2%
Table of composite correction values:

Temp., deg. C:	16.7	18.6
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	16.7	9.0	3.0	0.0142	9.5	13.8	0.0528	3.0	97.0
2.00	16.7	8.5	2.5	0.0142	9.0	13.9	0.0375	2.5	97.5
4.00	16.7	8.5	2.5	0.0142	9.0	13.9	0.0265	2.5	97.5
8.00	16.8	8.5	2.5	0.0142	9.0	13.9	0.0187	2.5	97.5
15.00	16.9	8.5	2.5	0.0142	9.0	13.9	0.0137	2.5	97.5
30.00	17.0	8.5	2.5	0.0142	9.0	13.9	0.0097	2.5	97.5
60.00	17.3	8.0	2.0	0.0141	8.5	14.0	0.0068	2.0	98.0
120.00	17.6	8.0	2.0	0.0141	8.5	14.0	0.0048	2.0	98.0
240.00	18.4	8.0	2.0	0.0139	8.5	14.0	0.0034	2.0	98.0
480.00	18.6	7.5	1.5	0.0139	8.0	14.2	0.0024	1.5	98.5
1440.00	18.2	7.5	1.5	0.0140	8.0	14.2	0.0014	1.5	98.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.2	95.6	95.8	2.7	1.5	4.2

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0934	0.1572	0.1666	0.1753	0.1918	0.2086	0.2265	0.2466	0.3023	0.3220	0.3462	0.3780

Fineness Modulus	C_u	C_c
1.14	1.57	0.95

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 08-L9
USCS: SP-SM

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
316.84	216.84	216.84	#10	216.84	100.0	0.0
			#20	217.07	99.8	0.2
			#40	217.44	99.4	0.6
			#60	238.72	78.1	21.9
			#100	307.81	9.0	91.0
			#200	310.09	6.7	93.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 131.98
Dry weight and tare = 131.40
Tare weight = 31.94
Hygroscopic moisture = 0.6%
Table of composite correction values:

Temp., deg. C:	15.4	18.9
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	15.4	11.0	5.0	0.0145	11.5	13.3	0.0527	5.0	95.0
2.00	15.4	11.0	5.0	0.0145	11.5	13.3	0.0373	5.0	95.0
4.00	15.5	11.0	5.0	0.0145	11.5	13.3	0.0263	5.0	95.0
8.00	15.6	11.0	5.0	0.0144	11.5	13.3	0.0186	5.0	95.0
15.00	15.9	10.5	4.5	0.0144	11.0	13.4	0.0136	4.5	95.5
30.00	16.1	10.5	4.5	0.0143	11.0	13.4	0.0096	4.5	95.5
60.00	16.5	10.5	4.5	0.0143	11.0	13.4	0.0067	4.5	95.5
120.00	17.6	9.5	3.5	0.0141	10.0	13.6	0.0047	3.5	96.5
240.00	18.6	9.0	3.0	0.0139	9.5	13.8	0.0033	3.0	97.0
480.00	18.9	8.5	2.5	0.0138	9.0	13.9	0.0024	2.5	97.5
1440.00	18.6	8.5	2.5	0.0139	9.0	13.9	0.0014	2.5	97.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.6	92.7	93.3	4.2	2.5	6.7

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0181	0.1516	0.1590	0.1657	0.1783	0.1907	0.2036	0.2176	0.2545	0.2686	0.2877	0.3188

Fineness Modulus	C_u	C_c
0.99	1.44	0.96

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 09-L10
USCS: SP-SM

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
288.25	188.25	188.25	#10	188.26	100.0	0.0
			#20	188.33	99.9	0.1
			#40	188.52	99.7	0.3
			#60	230.17	58.1	41.9
			#100	279.35	8.9	91.1
			#200	280.40	7.9	92.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 142.83
Dry weight and tare = 142.50
Tare weight = 31.28
Hygroscopic moisture = 0.3%
Table of composite correction values:

Temp., deg. C:	15.3	19.0
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	15.3	10.5	4.5	0.0145	11.0	13.4	0.0530	4.5	95.5
2.00	15.3	10.0	4.0	0.0145	10.5	13.5	0.0377	4.0	96.0
4.00	15.4	10.0	4.0	0.0145	10.5	13.5	0.0266	4.0	96.0
8.00	15.6	10.0	4.0	0.0144	10.5	13.5	0.0188	4.0	96.0
15.00	15.7	10.0	4.0	0.0144	10.5	13.5	0.0137	4.0	96.0
30.00	16.2	10.0	4.0	0.0143	10.5	13.5	0.0096	4.0	96.0
60.00	16.6	10.0	4.0	0.0142	10.5	13.5	0.0068	4.0	96.0
120.00	17.4	9.0	3.0	0.0141	9.5	13.8	0.0048	3.0	97.0
240.00	18.8	9.0	3.0	0.0139	9.5	13.8	0.0033	3.0	97.0
480.00	19.0	8.0	2.0	0.0138	8.5	14.0	0.0024	2.0	98.0
1440.00	18.6	8.0	2.0	0.0139	8.5	14.0	0.0014	2.0	98.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
					0.3	91.8		5.9	2.0	7.9

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0572	0.1530	0.1646	0.1748	0.1937	0.2125	0.2323	0.2545	0.3126	0.3321	0.3554	0.3849

Fineness Modulus	C_u	C_c
1.15	1.66	0.96

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 010-L11
USCS: SP-SM

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
316.94	216.94	216.94	#10	216.94	100.0	0.0
			#20	218.91	98.0	2.0
			#40	220.84	96.1	3.9
			#60	244.40	72.5	27.5
			#100	303.96	13.0	87.0
			#200	310.45	6.5	93.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 88.53
Dry weight and tare = 88.38
Tare weight = 30.49
Hygroscopic moisture = 0.3%
Table of composite correction values:
Temp., deg. C: 15.7 19.0
Comp. corr.: -6.0 -6.0
Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	15.7	12.0	6.0	0.0144	12.5	13.0	0.0520	6.0	94.0
2.00	15.7	11.0	5.0	0.0144	11.5	13.3	0.0371	5.0	95.0
4.00	15.8	11.0	5.0	0.0144	11.5	13.3	0.0262	5.0	95.0
8.00	15.9	11.0	5.0	0.0144	11.5	13.3	0.0185	5.0	95.0
15.00	16.2	11.0	5.0	0.0143	11.5	13.3	0.0135	5.0	95.0
30.00	16.2	10.0	4.0	0.0143	10.5	13.5	0.0096	4.0	96.0
60.00	16.9	10.0	4.0	0.0142	10.5	13.5	0.0067	4.0	96.0
120.00	17.7	10.0	4.0	0.0140	10.5	13.5	0.0047	4.0	96.0
240.00	18.9	9.5	3.5	0.0138	10.0	13.6	0.0033	3.5	96.5
480.00	19.0	9.5	3.5	0.0138	10.0	13.6	0.0023	3.5	96.5
1440.00	18.7	9.0	3.0	0.0139	9.5	13.8	0.0014	3.0	97.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	3.9	89.6	93.5	3.0	3.5	6.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0134	0.1190	0.1536	0.1618	0.1767	0.1913	0.2065	0.2235	0.2724	0.2936	0.3253	0.3926

Fineness Modulus	C_u	C_c
1.05	1.88	1.17

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 011-L12
USCS: SP-SM

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
447.93	264.61	264.61	1.5"	264.61	100.0	0.0
			3/4"	266.87	98.8	1.2
			#4	303.29	78.9	21.1
267.20	217.20	217.20	#10	217.21	78.9	21.1
			#20	218.46	76.9	23.1
			#40	219.49	75.3	24.7
			#60	220.58	73.6	26.4
			#100	252.18	23.7	76.3
			#200	261.80	8.5	91.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 78.9
Weight of hydrometer sample =50
Hygroscopic moisture correction:
Moist weight and tare = 103.97
Dry weight and tare = 103.82
Tare weight = 30.57
Hygroscopic moisture = 0.2%
Table of composite correction values:
Temp., deg. C: 16.6 19.0
Comp. corr.: -6.0 -6.0
Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	16.6	10.5	4.5	0.0142	11.0	13.4	0.0521	7.1	92.9
2.00	16.6	10.0	4.0	0.0142	10.5	13.5	0.0370	6.3	93.7
4.00	16.7	10.0	4.0	0.0142	10.5	13.5	0.0262	6.3	93.7
8.00	16.8	10.0	4.0	0.0142	10.5	13.5	0.0185	6.3	93.7
15.00	16.9	10.0	4.0	0.0142	10.5	13.5	0.0135	6.3	93.7
30.00	17.1	10.0	4.0	0.0142	10.5	13.5	0.0095	6.3	93.7
60.00	17.4	9.5	3.5	0.0141	10.0	13.6	0.0067	5.5	94.5
120.00	17.9	9.0	3.0	0.0140	9.5	13.8	0.0047	4.7	95.3
240.00	18.9	8.5	2.5	0.0138	9.0	13.9	0.0033	4.0	96.0
480.00	19.0	8.0	2.0	0.0138	8.5	14.0	0.0024	3.2	96.8
1440.00	18.7	8.0	2.0	0.0139	8.5	14.0	0.0014	3.2	96.8

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.2	19.9	21.1	0.0	3.6	66.8	70.4	5.3	3.2	8.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0054	0.0847	0.1106	0.1335	0.1609	0.1770	0.1937	0.2126	5.3684	7.6788	10.2525	13.8755

Fineness Modulus	C_u	C_c
2.03	2.51	1.44

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 012-L13
USCS: GP

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
474.04	272.13	272.13	3/4	272.13	100.0	0.0
			#4	392.54	40.4	59.6
268.55	218.55	218.55	#10	218.55	40.4	59.6
			#20	224.01	36.0	64.0
			#40	226.87	33.6	66.4
			#60	229.54	31.5	68.5
			#100	251.50	13.8	86.2
			#200	262.50	4.9	95.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 40.4
Weight of hydrometer sample =50
Hygroscopic moisture correction:
Moist weight and tare = 71.95
Dry weight and tare = 71.81
Tare weight = 30.48
Hygroscopic moisture = 0.3%
Table of composite correction values:
Temp., deg. C: 17.0 19.0
Comp. corr.: -6.0 -6.0
Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	17.0	13.0	7.0	0.0142	13.5	12.7	0.0506	5.7	94.3
2.00	17.0	12.0	6.0	0.0142	12.5	13.0	0.0361	4.9	95.1
4.00	17.2	11.5	5.5	0.0141	12.0	13.1	0.0256	4.5	95.5
8.00	17.2	11.5	5.5	0.0141	12.0	13.1	0.0181	4.5	95.5
15.00	17.3	11.5	5.5	0.0141	12.0	13.1	0.0132	4.5	95.5
30.00	17.4	11.5	5.5	0.0141	12.0	13.1	0.0093	4.5	95.5
60.00	17.6	10.5	4.5	0.0141	11.0	13.4	0.0066	3.6	96.4
120.00	18.2	10.5	4.5	0.0140	11.0	13.4	0.0047	3.6	96.4
240.00	19.0	9.5	3.5	0.0138	10.0	13.6	0.0033	2.8	97.2
480.00	18.5	9.5	3.5	0.0139	10.0	13.6	0.0023	2.8	97.2
1440.00	18.8	9.5	3.5	0.0139	10.0	13.6	0.0013	2.8	97.2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	59.6	59.6	0.0	6.8	28.7	35.5	2.1	2.8	4.9

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0773	0.1238	0.1557	0.1781	0.2355	1.8837	6.9815	8.9680	13.3616	14.6291	15.9895	17.4574

Fineness Modulus	C_u	C_c
4.38	72.42	0.05

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 013-L14
USCS: SC

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
282.98	232.98	232.98	#10	233.00	100.0	0.0
			#20	233.98	98.0	2.0
			#40	234.59	96.8	3.2
			#60	234.97	96.0	4.0
			#100	262.09	41.8	58.2
			#200	273.86	18.2	81.8

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =50
Hygroscopic moisture correction:
Moist weight and tare = 131.96
Dry weight and tare = 131.48
Tare weight = 30.88
Hygroscopic moisture = 0.5%
Table of composite correction values:

Temp., deg. C:	17.3	19.2
Comp. corr.:	-6.0	-6.0

Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	17.3	15.0	9.0	0.0141	15.5	12.2	0.0493	18.1	81.9
2.00	17.3	14.5	8.5	0.0141	15.0	12.3	0.0351	17.1	82.9
4.00	17.4	14.5	8.5	0.0141	15.0	12.3	0.0248	17.1	82.9
8.00	17.4	14.5	8.5	0.0141	15.0	12.3	0.0175	17.1	82.9
15.00	17.5	14.5	8.5	0.0141	15.0	12.3	0.0128	17.1	82.9
30.00	17.6	14.0	8.0	0.0141	14.5	12.5	0.0091	16.1	83.9
60.00	17.9	13.5	7.5	0.0140	14.0	12.6	0.0064	15.1	84.9
120.00	18.3	12.5	6.5	0.0139	13.0	12.9	0.0046	13.1	86.9
240.00	19.2	11.5	5.5	0.0138	12.0	13.1	0.0032	11.0	89.0
480.00	18.6	11.5	5.5	0.0139	12.0	13.1	0.0023	11.0	89.0
1440.00	18.9	11.0	5.0	0.0138	11.5	13.3	0.0013	10.0	90.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
					3.2	78.6		7.3	10.9	18.2

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0063	0.0973	0.1287	0.1471	0.1623	0.1768	0.2092	0.2192	0.2310	0.2461

Fineness Modulus
0.66

GRAIN SIZE DISTRIBUTION TEST DATA

2/22/2019

Client: ALS
Project: ALS
HS19020370
Project Number: 19.14.025
Location: HS19020370
Sample Number: 014-L15
USCS: ML

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
318.20	218.20	218.20	#10	218.21	100.0	0.0
			#20	218.22	100.0	0.0
			#40	218.28	99.9	0.1
			#60	218.66	99.5	0.5
			#100	251.11	67.1	32.9
			#200	261.69	56.5	43.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =100
Hygroscopic moisture correction:
Moist weight and tare = 168.86
Dry weight and tare = 168.47
Tare weight = 31.27
Hygroscopic moisture = 0.3%
Table of composite correction values:
Temp., deg. C: 17.4 19.2
Comp. corr.: -6.0 -6.0
Meniscus correction only = 0.5
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: $L = 16.294964 - 0.2645 \times Rm$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	17.8	12.5	6.5	0.0140	13.0	12.9	0.0503	6.5	93.5
2.00	17.8	12.0	6.0	0.0140	12.5	13.0	0.0358	6.0	94.0
4.00	17.5	11.5	5.5	0.0141	12.0	13.1	0.0255	5.5	94.5
8.00	17.6	11.5	5.5	0.0141	12.0	13.1	0.0180	5.5	94.5
15.00	17.4	11.5	5.5	0.0141	12.0	13.1	0.0132	5.5	94.5
30.00	17.8	11.0	5.0	0.0140	11.5	13.3	0.0093	5.0	95.0
60.00	18.1	10.5	4.5	0.0140	11.0	13.4	0.0066	4.5	95.5
120.00	18.4	10.5	4.5	0.0139	11.0	13.4	0.0046	4.5	95.5
240.00	19.2	9.5	3.5	0.0138	10.0	13.6	0.0033	3.5	96.5
480.00	18.8	9.5	3.5	0.0139	10.0	13.6	0.0023	3.5	96.5
1440.00	18.9	9.0	3.0	0.0138	9.5	13.8	0.0014	3.0	97.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
					0.1	43.4		53.1	3.4	56.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0093	0.0525	0.0550	0.0572	0.0614	0.0658	0.0708	0.0943	0.1875	0.2002	0.2140	0.2301

Fineness Modulus	C_u	C_c
0.33	1.80	0.76

ATTACHMENT 4

INVERTEBRATE PHOTOLOG

PHOTO 1:

Magelona riojai, a polychaete worm belonging to the Family Magelonidae, found in benthic samples from L-1, L-7, L-8, and L-9.

PHOTO 2:

Onuphis eremita oculata, a polychaete worm belonging to the Family Onuphidae, found in benthic samples from L-9 and L-11.

PHOTO 3:

Laonome sp., a polychaete worm belonging to the Family Sabellidae, found in benthic samples from L-2 and L-4.

PHOTO 4:

Astyris lunata, a gastropod mollusc belonging to the Family Columbellidae, found in the benthic sample from L-6.

PHOTO 5:

Nassarius acutus, a gastropod mollusc belonging to the Family Nassariidae, found in the benthic sample from L-15.

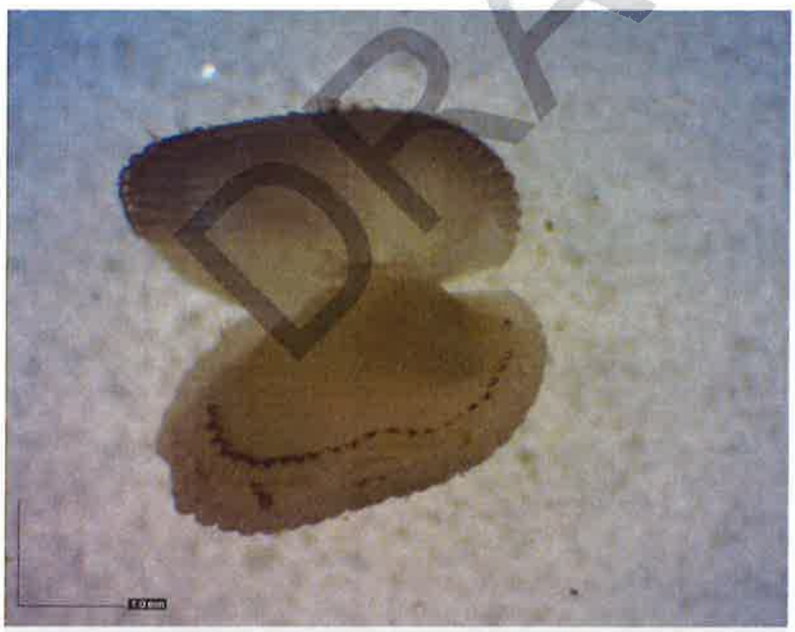


PHOTO 6:

Anadara transversa, a bivalve mollusk belonging to the Family Arcidae, found in benthic samples from L-6, L-10, L-13, and L-14.

PHOTO 7:

Petricolaria pholadiformis, a bivalve mollusc belonging to the Family Petricolidae, found in benthic samples from L-4 and L-12.

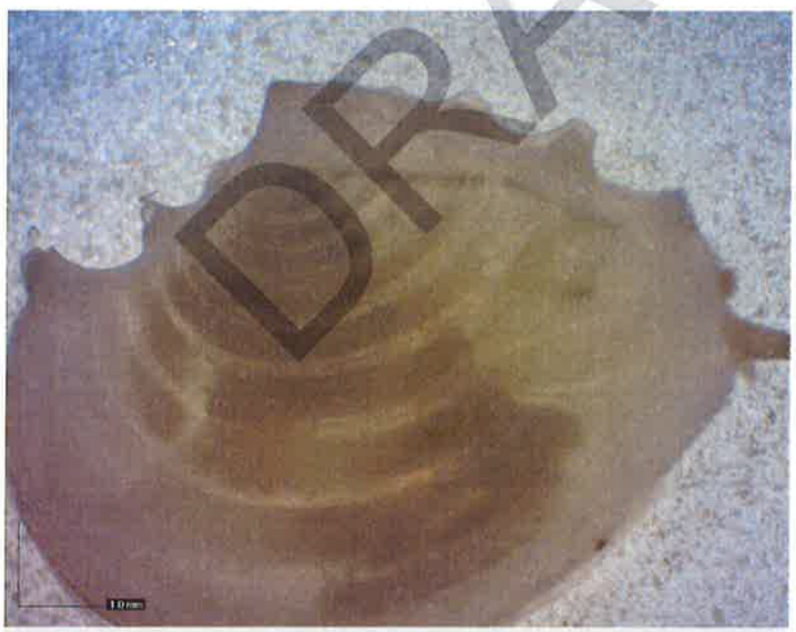


PHOTO 8:

Tellidora cristata, a bivalve mollusc belonging to the Family Tellinidae, found in the benthic sample from L-12.

PHOTO 9:

Oxyurostylis lecroyae, a cumacean crustacean belonging to the Family Diastylidae, found in benthic samples from L-2, L-5, and L-15.

PHOTO 10:

Caprella equilibra, an amphipod crustacean belonging to the Family Caprellidae, found in benthic samples from L-4 and L-6 and the plankton sample from P-1.

PHOTO 11:

Monocorophium tuberculatum, an amphipod crustacean belonging to the Family Corophiidae, found in benthic samples from L-2 and L-6.

PHOTO 12:

Elasmopus levis, an amphipod crustacean belonging to the Family Melitidae, found in the benthic sample from L-6.

PHOTO 13:

Argissa hamatipes, an amphipod crustacean belonging to the Family Argissidae, found in the benthic sample from L-2.

PHOTO 14:

Eobrolgus spinosus, an amphipod crustacean belonging to the Family Phoxocephalidae, found in the benthic sample from L-6.

PHOTO 15:

Ericthonius brasiliensis, an amphipod crustacean belonging to the Family Ischyroceridae, found in the benthic sample from L-6.

PHOTO 16:

Eudevenopus honduranus, an amphipod crustacean belonging to the Family Platyischnopidae, found in the benthic sample from L-5.

PHOTO 17:

Protohaustorius cf. *bousfieldi*, an amphipod crustacean found in benthic samples from L-5, L-7, and L-8.

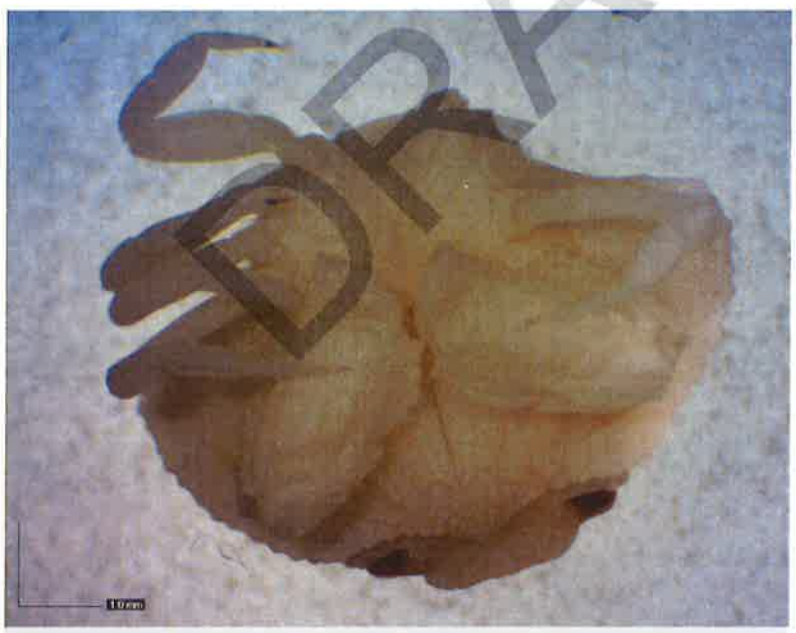


PHOTO 18:

Hepatus sp., a decapod crustacean belonging to the Family Hepatidae, found in the benthic sample from L-4.

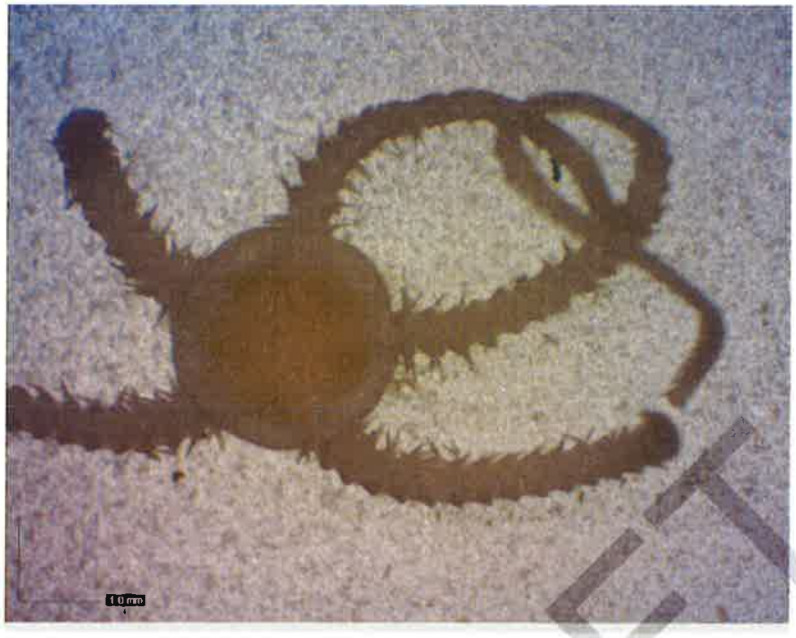


PHOTO 19:

Amphiodia atra, an ophiuroid echinoderm belonging to the Family Amphiuridae, found in the benthic sample from L-12.

PHOTO 20:

Hemipholis cordifera, an ophiuroid echinoderm belonging to the Family Ophiactidae, found in the benthic sample from L-6.

PHOTO 21:

Amathia alternata, a colonial bryozoan belonging to the Family Vesiculariidae, found in benthic samples from L-2, L-4, L-6, L-10, L-14, and L-15.

PHOTO 22:

Bugula neritina, a colonial bryozoan belonging to the Family Bugulidae, found in benthic samples from L-2, L-3, L-10, L-13, L-14, and L-15.

APPENDICES

APPENDIX 1
PHYLOGENETIC TAXONOMIC LIST FOR BENTHIC SAMPLES
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Species ID	Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Species Notes	Reference
000000000010	Porifera						Porifera spp.	Colonial; present	
010200000000	Cnidaria		Anthozoa				Anthozoa spp.		
010303010100	Cnidaria		Hydrozoa	Hydroidolina	Anthoathecata	Eudendriidae	*Eudendrium* spp.	Colonial; present	Boullion & Boero, 2000; Felder & Camp, 2009
010303030100	Cnidaria		Hydrozoa	Hydroidolina	Anthoathecata	Tubulariidae	*Ectopleura* spp.	Colonial; present	Boullion & Boero, 2000; Felder & Camp, 2009
010304000000	Cnidaria		Hydrozoa	Hydroidolina	Leptothecata		Leptothecata spp.	Colonial; present	Boullion & Boero, 2000; Felder & Camp, 2009
010304010000	Cnidaria		Hydrozoa	Hydroidolina	Leptothecata	Campanulariidae	Campanulariidae spp.	Colonial; present	Boullion & Boero, 2000; Felder & Camp, 2009
010304010101	Cnidaria		Hydrozoa	Hydroidolina	Leptothecata	Campanulariidae	*Laomedea* cf. *flexuosa*	Colonial; present	Boullion & Boero, 2000; Felder & Camp, 2009
010304040100	Cnidaria		Hydrozoa	Hydroidolina	Leptothecata	Lovenellidae	*Lovenella* spp.	Colonial; present	
020000000000	Platyhelminthes						Platyhelminthes spp.		
030000000000	Nemertea						Nemertea spp.		
030101000000	Nemertea		Anopla		Palaeonemertea		Palaeonemertea spp.		
030101010101	Nemertea		Anopla		Palaeonemertea	Tubulanidae	*Tubulanus pellucidus*		
030102000000	Nemertea		Anopla		Heteronemertea		Heteronemertea spp.		
030201030101	Nemertea		Enopla		Hoplonemertea	Amphiporidae	*Zygonemertes virescens*		
040101010100	Annelida		Polychaeta	Sedentaria		Orbiniidae	*Leitoscoloplos* spp.		
040101010200	Annelida		Polychaeta	Sedentaria		Orbiniidae	*Scoloplos* spp.		
040101010203	Annelida		Polychaeta	Sedentaria		Orbiniidae	*Scoloplos capensis*		
040101020202	Annelida		Polychaeta	Sedentaria		Paraonidae	*Aricidea (Acmira) philbinae*		
040104010100	Annelida		Polychaeta	Sedentaria		Cossuridae	*Cossura* spp.		
040105020201	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Minuspio perkinsi*	=Prionospio perkinsi	Delgado-Blas & Salazar-Silva, 2011
040105020204	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Prionospio cristata*		
040105020400	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Streblospio* spp.		Rice & Levin, 1998
040105020501	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Paraprionospio yokoyamai*	=Paraprionospio pinnata/alata	Delgado-Blas & Carrera-Parra, 2018; Yokoyama, 2007; Delgado-Blas, 2004
040105020601	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Dipolydora socialis*	=Polydora socialis	Blake, 1996
040105020602	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Polydora websteri*		
040105020603	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Polydora cornuta* sp. complex	=Polydora cornuta/ligni	Blake & Maciolek, 1987; Rice et al. 2008
040105020607	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Polydora aggregata*		
040105020701	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Apoprionospio pygmaea*		Foster, 1969
040105021001	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Spiophanes bombyx*		
040105021301	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	*Boccardiella hamata*		
040105030101	Annelida		Polychaeta incertae sedis			Magelonidae	*Magelona pettiboneae*		
040105030102	Annelida		Polychaeta incertae sedis			Magelonidae	*Meredithia uebelackerae*	=Magelona sp. H (of Uebelacker & Jones, 1984)	Hernandez-Alcantara & Solis-Weiss, 2000
040105030104	Annelida		Polychaeta incertae sedis			Magelonidae	*Magelona riojai*		
040105070101	Annelida		Polychaeta	Sedentaria		Chaetopteridae	*Spiochaetopterus costarum* sp. complex	=Spiochaetopterus costarum	Bhaud et al., 2003; Bhaud, 2003; Bhaud & Petti, 2001
040105080300	Annelida		Polychaeta	Sedentaria	Terebellida	Cirratulidae	*Cirriformia* spp.		

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PHYLOGENETIC TAXONOMIC LIST FOR BENTHIC SAMPLES
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Species ID	Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Species Notes	Reference
040105080400	Annelida		Polychaeta	Sedentaria	Terebellida	Cirratulidae	*Aphelochaeta* spp.		
040105080601	Annelida		Polychaeta	Sedentaria	Terebellida	Cirratulidae	*Dodecaceria* sp. A		of Wolf, 1984
040106010300	Annelida		Polychaeta	Sedentaria		Capitellidae	*Mediomastus* spp.		
040106010301	Annelida		Polychaeta	Sedentaria		Capitellidae	*Mediomastus californiensis*		
040106010302	Annelida		Polychaeta	Sedentaria		Capitellidae	*Mediomastus ambiseta*		
040106010400	Annelida		Polychaeta	Sedentaria		Capitellidae	*Notomastus* spp.		
040106020101	Annelida		Polychaeta	Sedentaria		Arenicolidae	*Arenicola cristata*		
040107010102	Annelida		Polychaeta	Sedentaria		Opheliidae	*Armandia agilis*		
040108010102	Annelida		Polychaeta	Errantia	Phyllodocida	Phyllodocidae	*Eteone foliosa*	=Eteone lactea	Wilson, 1988
040108100100	Annelida		Polychaeta	Errantia	Phyllodocida	Sigalionidae	*Sthenelais* spp.		
040108140101	Annelida		Polychaeta	Errantia	Phyllodocida	Hesionidae	*Podarkeopsis levifuscina*		
040108150102	Annelida		Polychaeta	Errantia	Phyllodocida	Pilargidae	*Sigambra tentaculata*		
040108150302	Annelida		Polychaeta	Errantia	Phyllodocida	Pilargidae	*Ancistrosyllis papillosa*		
040108160100	Annelida		Polychaeta	Errantia	Phyllodocida	Syllidae	*Syllis (Typosyllis)* spp.	Subgenus	
040108160103	Annelida		Polychaeta	Errantia	Phyllodocida	Syllidae	*Syllis (Typosyllis) alosae*		
040108160201	Annelida		Polychaeta	Errantia	Phyllodocida	Syllidae	*Exogone dispar*		
040108160301	Annelida		Polychaeta	Errantia	Phyllodocida	Syllidae	*Syllis (Syllis) gracilis* sp. complex		Cognetti & Maltagliati, 2000
040108160701	Annelida		Polychaeta	Errantia	Phyllodocida	Syllidae	*Salvatoria clavata*	=Brania/Grubeosyllis clavata	San Martin, 1991, 2003
040108180201	Annelida		Polychaeta	Errantia	Phyllodocida	Nereididae	*Neanthes micromma*		
040108180202	Annelida		Polychaeta	Errantia	Phyllodocida	Nereididae	*Alitta succinea*	=Neanthes succinea	Bakken, 2004; Bakken & Wilson, 2005
040108180400	Annelida		Polychaeta	Errantia	Phyllodocida	Nereididae	*Nereis* spp.		
040108180401	Annelida		Polychaeta	Errantia	Phyllodocida	Nereididae	*Nereis falsa*		
040108200101	Annelida		Polychaeta	Errantia	Phyllodocida	Glyceridae	*Glycera americana*		
040108210000	Annelida		Polychaeta	Errantia	Phyllodocida	Goniadidae	Goniadidae spp.		
040108210101	Annelida		Polychaeta	Errantia	Phyllodocida	Goniadidae	*Glycinde multidens*	=Glycinde solitaria	Boggemann, 2005
040108240103	Annelida		Polychaeta	Errantia	Phyllodocida	Nephtyidae	*Nephtys cryptomma*		
040108240201	Annelida		Polychaeta	Errantia	Phyllodocida	Nephtyidae	*Aglaophamus verrilli*		
040111010101	Annelida		Polychaeta	Errantia	Eunicida	Onuphidae	*Diopatra cuprea*		
040111010401	Annelida		Polychaeta	Errantia	Eunicida	Onuphidae	*Onuphis eremita oculata*	Subspecies	
040111030201	Annelida		Polychaeta	Errantia	Eunicida	Lumbrineridae	*Scoletoma verrilli*	=Lumbrineris verrilli	Carrera-Parra, 2001
040113010000	Annelida		Polychaeta	Sedentaria	Sabellida	Oweniidae	Oweniidae spp.		
040113010101	Annelida		Polychaeta	Sedentaria	Sabellida	Oweniidae	*Owenia* sp. A		of Milligan, 1984
040116030003	Annelida		Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetidae sp. A	=Sabellides sp. A (of Uebelacker, 1984)	of Davenport, pers. comm.
040116030201	Annelida		Polychaeta	Sedentaria	Terebellida	Ampharetidae	*Melinna maculata*		
040116030301	Annelida		Polychaeta	Sedentaria	Terebellida	Ampharetidae	*Isolda pulchella*		
040117010001	Annelida		Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae spp.	Subfamily	
040117010303	Annelida		Polychaeta	Sedentaria	Sabellida	Sabellidae	*Acromegalomma bioculatum*	=Megalomma bioculatum	Gil & Nishi, 2017
040117011200	Annelida		Polychaeta	Sedentaria	Sabellida	Sabellidae	*Laonome* spp.		
040117011300	Annelida		Polychaeta	Sedentaria	Sabellida	Sabellidae	*Chone* spp.		

APPENDIX 1
PHYLOGENETIC TAXONOMIC LIST FOR BENTHIC SAMPLES
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Species ID	Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Species Notes	Reference
040117020000	Annelida		Polychaeta	Sedentaria	Sabellida	Serpulidae	Serpulidae spp.		
040117020002	Annelida		Polychaeta	Sedentaria	Sabellida	Serpulidae	Pileolariini spp.	Tribe	
040117020004	Annelida		Polychaeta	Sedentaria	Sabellida	Serpulidae	Januini spp.	Tribe	
040117020100	Annelida		Polychaeta	Sedentaria	Sabellida	Serpulidae	*Hydroides* spp.		
040117020101	Annelida		Polychaeta	Sedentaria	Sabellida	Serpulidae	*Hydroides dianthus*		
040201020000	Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	Naididae spp.	=Tubificidae spp.	Erseus et al., 2008
040201020003	Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	Tubificinae spp.	Subfamily	
040201020401	Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Tubificoides brownae*		
050100000001	Mollusca		Gastropoda	Heterobranchia			Heterobranchia spp.	Subclass	
050103020101	Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Caecidae	*Caecum pulchellum*		
050108010000	Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Calyptraeidae	Calyptraeidae spp.		
050108010103	Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Calyptraeidae	*Crepidula depressa*	=Crepidula plana	Collin, 2000
050111010000	Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	Naticidae spp.		
050111010202	Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	*Neverita delessertiana*		
050116020000	Mollusca		Gastropoda	Caenogastropoda	Neogastropoda	Buccinidae	Buccinidae spp.		
050116030101	Mollusca		Gastropoda	Caenogastropoda	Neogastropoda	Columbellidae	*Astyris lunata*		
050116030202	Mollusca		Gastropoda	Caenogastropoda	Neogastropoda	Columbellidae	*Parvanachis ostreicola*		
050116040103	Mollusca		Gastropoda	Caenogastropoda	Neogastropoda	Nassariidae	*Nassarius acutus*		
050120010501	Mollusca		Gastropoda	Heterobranchia		Pyramidellidae	*Cyclostremella humilis*		
050120010603	Mollusca		Gastropoda	Heterobranchia		Pyramidellidae	*Eulimastoma harbisonae*		
050200000000	Mollusca		Bivalvia				Bivalvia spp.		
050202010101	Mollusca		Bivalvia	Pteriomorphia	Arcoida	Arcidae	*Anadara transversa*		
050204010101	Mollusca		Bivalvia	Pteriomorphia	Mytiloida	Mytilidae	*Arcuatula papyria*	=Amygdalum papyrium	
050211010101	Mollusca		Bivalvia	Heterodonta	Veneroida	Lucinidae	*Parvilucina crenella*	=Parvilucina multilineata	Mikkelsen & Bieler, 2008
050216010101	Mollusca		Bivalvia	Heterodonta	Veneroida	Mactridae	*Mulinia lateralis*		
050218010000	Mollusca		Bivalvia	Heterodonta	Veneroida	Tellinidae	Tellinidae spp.		
050218010202	Mollusca		Bivalvia	Heterodonta	Veneroida	Tellinidae	*Ameritella versicolor*	=Angulus versicolor; =Tellina versicolor	Mikkelsen & Bieler, 2008; Huber et al., 2015
050218010401	Mollusca		Bivalvia	Heterodonta	Veneroida	Tellinidae	*Tellidora cristata*		
050218010701	Mollusca		Bivalvia	Heterodonta	Veneroida	Tellinidae	*Macoploma tenta*	=Macoma tenta	
050218011001	Mollusca		Bivalvia	Heterodonta	Veneroida	Tellinidae	*Pseudomacalia antillarum*	=Macoma pseudomera	
050220020101	Mollusca		Bivalvia	Heterodonta	Veneroida	Petricolidae	*Petricolaria pholadiformis*		
050220050000	Mollusca		Bivalvia	Heterodonta	Veneroida	Ungulinidae	Ungulinidae spp.		
050221020101	Mollusca		Bivalvia	Heterodonta	Myoida	Myidae	*Sphenia fragilis*	=Sphenia antillensis	Mikkelsen & Bieler, 2008
050221040401	Mollusca		Bivalvia	Heterodonta	Myoida	Pholadidae	*Diplothyra curta*	=Diplothyra smithii	Coan & Valentich-Scott, 2012
060101010000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Tanaidacea	Leptocheliidae	Leptocheliidae spp.		
060102010100	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	*Oxyurostylis* spp.		
060102010102	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	*Oxyurostylis lecroyae*		
060103010201	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Hyssuridae	*Xenanthura brevitelson*		
060104020201	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Melitidae	*Elasmopus levis*		

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PROJECT TURNPIKE

Species ID	Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Species Notes	Reference
060104040101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Bateidae	*Batea catharinensis*		
060104050201	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Haustoriidae	*Protohaustorius* cf. *bousfieldi*		
060104060101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Argissidae	*Argissa hamatipes*		
060104070301	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	*Americhelidium* sp. A		of Lecroy, 2000
060104100101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Phoxocephalidae	*Eobrolgus spinosus*		
060104120101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	*Ampelisca abdita*		
060104150100	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampithoidae	*Cymadusa* spp.		
060104170001	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiidae spp.		
060104170201	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ischyroceridae	*Ericthonius brasiliensis*		
060104170302	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ischyroceridae	*Cerapus ryanadamsi*	=Cerapus sp. C (of LeCroy, 2007)	Drumm, 2018
060104170400	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	*Monocorophium* spp.		
060104170401	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	*Monocorophium acherusicum*		
060104170402	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	*Monocorophium* sp. A		of Lecroy, 2004
060104170403	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	*Monocorophium tuberculatum*		
060104170501	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	*Laticorophium baconi*		
060104200000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	Caprellidae spp.		
060104200100	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	*Caprella* spp.		
060104200103	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	*Caprella equilibra*		
060104200200	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	*Paracaprella* spp.		
060104200201	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	*Paracaprella tenuis*		
060104200202	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	*Paracaprella pusilla*		
060104200401	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	Caprellidae sp. A		of Knight-Gray, pers. comm.
060104220101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Platyischnopidae	*Eudevenopus honduranus*		
060104250101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Podoceridae	*Podocerus brasiliensis*		
060104260101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Photidae	*Photis* cf. *longicaudata*		Lecroy et al., 2009
060104260103	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Photidae	*Photis macromana*		
060105000006	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda		Paguroidea spp.	Superfamily	
060105000011	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda		Brachyura spp.	Infraorder	
060105010000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Penaeidae	Penaeidae spp.		
060105130000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Panopeidae	Panopeidae spp.	=Xanthidae spp.	
060105160000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Portunidae	Portunidae spp.		
060105220100	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Hepatidae	*Hepatus* spp.		
060106010205	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	*Americamysis stucki*		
060107000000	Arthropoda	Crustacea	Hexanauplia	Thecostraca	Sessilia		Sessilia spp.		
070301010000	Echinodermata	Eleutherozoa	Ophiuroidea		Ophiurida	Amphiuridae	Amphiuridae spp.		
070301010301	Echinodermata	Eleutherozoa	Ophiuroidea		Ophiurida	Amphiuridae	*Amphiodia atra*	=Microphalus atra	
070301020101	Echinodermata	Eleutherozoa	Ophiuroidea		Ophiurida	Ophiactidae	*Hemipholis cordifera*	=Hemipholis elongata	Hendler, 2011
090101010100	Phoronida						*Phoronis* spp.		

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PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Species ID	Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Species Notes	Reference
110100000000	Chordata	Tunicata	Ascidiacea				Ascidiacea spp.	Colonial; present	
110501010101	Chordata		Cephalochordata		Amphioxiformes	Branchiostomatidae	*Branchiostoma floridae*		
130101000003	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida		Membraniporoidea spp.	Colonial; present, Superfamily	
130101010000	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida	Electridae	Electridae spp.	Colonial; present	
130101010101	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida	Electridae	*Conopeum tenuissimum*	Colonial; present	
130101010201	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida	Electridae	*Arbocuspis bellula*	Colonial: present	
130101020202	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida	Membraniporidae	*Biflustra denticulata*	Colonial; present	
130101030200	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida	Schizoporellidae	*Schizoporella* spp.	Colonial; present	Winston, 1982
130101050101	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida	Bugulidae	*Bugula neritina*	Colonial; present	
130101060100	Bryozoa (Ectoprocta)		Gymnolaemata		Cheilostomatida	Epistomiidae	*Synnotum* spp.	Colonial; present	
130102010301	Bryozoa (Ectoprocta)		Gymnolaemata		Ctenostomatida	Vesiculariidae	*Amathia distans*	Colonial; present	
130102010302	Bryozoa (Ectoprocta)		Gymnolaemata		Ctenostomatida	Vesiculariidae	*Amathia alternata*	Colonial: present	
130102030100	Bryozoa (Ectoprocta)		Gymnolaemata		Ctenostomatida	Aeverrilliidae	*Aeverrillia* spp.	Colonial: present	
150101010101	Sipuncula		Sipunculidea		Golfingiiformes	Phascoliidae	*Phascolion cryptum*	=Phascolion cryptus	Cutler, 1994
160000000000	Echiura						Echiura spp.		
160101010101	Echiura		Echiuroidea		Echiuroinea	Echiuridae	*Thalassema philostracum*		

APPENDIX 2
PHYLOGENETIC TAXONOMIC LIST FOR PLANKTON SAMPLES
PORT OF CORPUS CHRISTI AUTHORITY
PROJECT TURNPIKE

Species ID	Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Species Notes	Reference
010000000000	Cnidaria						Cnidaria spp.		
010300000000	Cnidaria		Hydrozoa				Hydrozoa spp.	Colonial; present	
020103000000	Platyhelminthes	Rhabditophora			Rhabdocoela		Rhabdocoela spp.		
040100000000	Annelida		Polychaeta				Polychaeta spp.		
040105020000	Annelida		Polychaeta	Sedentaria	Spionida	Spionidae	Spionidae spp.		
050111010000	Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	Naticidae spp.		
050200000000	Mollusca		Bivalvia				Bivalvia spp.		
060102010100	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	*Oxyurostylis* spp.		
060104150000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampithoidae	Ampithoidae spp.		
060104170001	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiidae spp.		
060104170402	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	*Monocorophium* sp. A		of Lecroy, 2004
060104200103	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	*Caprella equilibra*		
060104200201	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Caprellidae	*Paracaprella tenuis*		
060104250101	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Podoceridae	*Podocerus brasiliensis*		
060105000000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda		Decapoda spp.		
060105000011	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda		Brachyura spp.	Infraorder	
060106010000	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysidae spp.		
060107000003	Arthropoda	Crustacea	Hexanauplia	Thecostraca			Cirripedia spp.	Infraclass	
060150000001	Arthropoda	Crustacea	Hexanauplia	Copepoda			Copepoda spp.	Subclass	
060151000000	Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida		Calanoida spp.		
060151020000	Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida	Pontellidae	Pontellidae spp.		
060151020101	Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida	Pontellidae	*Labidocera aestiva*		
060151030101	Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida	Temoridae	*Temora turbinata*		
060151040100	Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida	Centropagidae	*Centropages* spp.		
060154000000	Arthropoda	Crustacea	Hexanauplia	Copepoda	Misophrioida		Misophrioida spp.		
060155000000	Arthropoda	Crustacea	Hexanauplia	Copepoda	Siphonostomatoida		Siphonostomatoida spp.		
100000000000	Hemichordata						Hemichordata spp.		
110200000000	Chordata	Tunicata	Appendicularia				Appendicularia spp.		
110301000000	Chordata	Tunicata	Thaliacea		Doliolida		Doliolida spp.		
110605010000	Chordata	Vertebrata	Actinopterygii		Myctophiformes	Myctophidae	Myctophidae spp.		
110607010000	Chordata	Vertebrata	Actinopterygii		Pleuronectiformes	Bothidae	Bothidae spp.		
110609010000	Chordata	Vertebrata	Actinopterygii		Clupeiformes	Engraulidae	Engraulidae spp.		
110610010000	Chordata	Vertebrata	Actinopterygii		Gadiformes	Bregmacerotidae	Bregmacerotidae spp.		
110610020000	Chordata	Vertebrata	Actinopterygii		Gadiformes	Phycidae	Phycidae spp.		
110611010000	Chordata	Vertebrata	Actinopterygii		Scorpaeniformes	Scorpaenidae	Scorpaenidae spp.		
120101010201	Chaetognatha		Sagittoidea		Aphragmophora	Sagittidae	*Ferosagitta hispida*		
190000000000	Ctenophora						Ctenophora spp.		

Appendix G

Wetlands Delineation Report

WETLAND DELINEATION REPORT
PORT OF CORPUS CHRISTI

Port of Corpus Christi
Harbor Island
Port Aransas
Nueces County, Texas
Project # 6703180051 Port of Corpus Christi Authority

Prepared for:

Port of Corpus Christi
222 Power St, Corpus Christi, Texas

June 10, 2019

WETLAND DELINEATION REPORT PORT OF CORPUS CHRISTI

Port of Corpus Christi
Harbor Island
Port Aransas
Nueces County, Texas
Project # 6703180051 Port of Corpus Christi Authority

Prepared for:

Port of Corpus Christi
222 Power St, Corpus Christi, Texas

Prepared by:

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6/10/2019

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Charles R. Harman
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Table of Contents

Figures

Appendices

List of Acronyms and Abbreviations

CCSC	Corpus Christi Ship Channel
CFR	Code of Federal Regulation
CWA	Clean Water Act
DBH	Diameter at Breast Height
FAC	Facultative wetland plant
FACU	Facultative upland plant
FACW	Facultative wetland plant
FEMA	Federal Emergency Management Agency
GIS	Geographic Information Systems
NA	Not Applicable
NI	No Indicator
NL	Not Listed
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland plant
PCCA	Port of Corpus Christi Authority
Site	Harbor Island Project Site
TCEQ	Texas Commission on Environmental Quality
UPL	Upland plant
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
Wood	Wood Environment & Infrastructure Solutions

1.0 Introduction

This Wetland Delineation Report has been prepared on behalf of the Port of Corpus Christi Authority (PCCA) by Wood Environment & Infrastructure Solutions, Inc. (Wood) for Harbor Island (the Site). The Site is located in Port Aransas, Nueces County, Texas (**Figure 1**). This wetland delineation was performed in support of the future application to the Texas Commission on Environmental Quality (TCEQ) and United States Corps of Engineers (USACE) for Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act for the construction of a crude oil export terminal and associated marine berths that will service Very Large Crude Carriers (VLCCs). This report presents a description of the Site, the methods used to perform the delineation, the findings of a desktop delineation, the findings of a field delineation, and supporting documentation in the form of maps, photographs, notes, and wetland delineation datasheets.

1.1 Site Description

The Project Area is located at the convergence of Aransas Pass, the Corpus Christi Ship Channel, and Lydia Ann Channel between Nueces and Aransas Counties, Texas. It is a 254-acre parcel identified by Nueces County as Property ID 2411473 and 241506 owned by PCCA. However, this delineation was conducted on a smaller portion of 127 acres of the parcel. The project is located on the portion of Harbor Island that is east of TX-361 and is bordered to the east by the Tributary of the Aransas Pass. The coordinates for the approximate center of the Site are presented in the table below.

Table 1-1: Coordinates for the Approximate Center of the Site
Port of Corpus Christi, Corpus Christi,Nueces County, Texas

Latitude (North)	Longitude (West)
27.846162	-97.065775

Note: All coordinates are in presented in North American 1983 Datum.

wood.

2.0 Methods

The CWA of 1977 (33 United States Code [U.S.C.] 1344) defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 Code of Federal Regulations [CFR] 230.3).

From this regulatory definition, a three-parameter approach (i.e., vegetation, soils, and hydrology) was developed by the USACE in order to identify and delineate wetland for purposes of Section 404 of the CWA and Section 10 of the Rivers and Harbors Act (33 U.S.C. 403). This approach dictates that areas meeting the defined criteria of hydrophytic vegetation, hydric soils, and wetland hydrology will be designated as jurisdictional wetlands. The three-parameter approach is described in the *Corps of Engineers Wetlands Delineation Manual*, often referred to as either the "Corps Manual" or the "87 Manual" (Environmental Laboratory, 1987). After the issuance of the Corps Manual, a series of Regional Supplements have been developed or are in various stages of development that are specific to regional wetland characteristics across the United States. These Regional Supplements are designed for use with, not as a replacement for, the current version of the Corps Manual.

For vegetation, the criteria mean that more than 50% of the composition of the dominant species from all strata must be categorized as hydrophytic or adapted to living in saturated areas. That is, the plant species must be classified as obligate, facultative wetland or facultative as defined in the *National List of Plant Species That Occur in Wetlands*, published by the United States Fish & Wildlife Service (USFWS). Soils are considered hydric if they meet the criteria defined by the National Technical Committee for Hydric Soils in *Hydric Soils of the United States* (United States Department of Agriculture [USDA], 1987). Wetland hydrology must be present to affect either permanent or periodic saturation of the soil.

The first criterion, hydrophytic vegetation, is present when a predominance of the plant species present in a community is either obligate, facultative wetland, or facultative. The USFWS has compiled data on the habitat characteristics of plants of the United States based on frequency of observation in various regions. This list categorizes plant species by their frequency of occurrence as follows:

Obligate Wetland Plants (OBL): Those species that occur almost exclusively in wetlands (>99 percent of the time)

Facultative Wetland Plants (FACW): Those species that usually occur in wetlands (67 - 99 percent of the time)

Facultative Plants (FAC): Those species equally likely to occur in wetland or non-wetland (34 - 66 percent of the time)

Facultative Upland Plants (FACU): Those species that usually occur in non-wetlands (67 - 99 percent of the time)

Upland Plants (UPL): Those species that occur almost exclusively in uplands (>99 percent of the time).

Species for which insufficient information is available for classification are listed in the USFWS list with a designation of No Indicator (NI) for regional status. A designation of Not Listed (NL) was assigned by Wood if a species was not present on the USFWS list. According to the "1989 Manual", plants not listed are presumed to be upland species. A designation of Not Applicable (NA) was assigned by Wood for vegetation that could not be identified to species level.

To accurately describe the vegetation at each sampling point, data on each horizontal strata or layer was collected. Vegetative strata for which dominants were determined included:

Tree (≥ 5.0 inches diameter at breast height [dbh] and 20 feet or taller)

Sapling (0.4 to < 5.0 inches dbh and 20 feet or taller)

Shrub (usually 3 to 20 feet tall, including multi-stemmed, bushy shrubs and small trees and saplings)

Woody vine (determined by morphological characteristics and botanical classification)

Herb (herbaceous plants, including graminoids, forbs, ferns, fern allies, herbaceous vines, and tree seedlings)

The dominant species was determined by making visual estimates of tree, sapling, shrub, woody vine, and herb strata and by assigning one of the following cover classes, with the midpoints of each cover class in parentheses:

T < 1 percent (0)	4 = 26-50 percent (38.0)
1 = 1-5 percent (3.0)	5 = 51-75 percent (63.0)
2 = 6-15 percent (10.5)	6 = 76-95 percent (85.5)
3 = 16-25 percent (20.5)	7 = 96-100 percent (98.0)

The midpoints of each species were averaged at each sample point and ranked. The dominance threshold number was calculated and used to determine dominant species. Those species composing 50 percent of the total cover were considered to be the dominants, as were additional species representing 20 percent or more of the total cover class midpoint values for each stratum. The affinity of the dominant species to wetlands was used in determining the wetland status of each sample point.

A two-step process was used to determine the presence of hydric soils at each site. A preliminary desk-top assessment was first conducted that involved reviewing USDA Natural Resource Conservation Service (NRCS) soil maps and Geographic Information Systems (GIS) data. This desk-top assessment provided a coarse-scale examination of the potential locations for hydric soils on each site.

The second step of this process was the field examination of site soils. Soil borings were used to examine the nature of the soil below the "A" horizon. The hydric nature of soils can generally be determined by color changes resulting from the chemical reduction of soil components, which occurs because of extended periods of saturation or inundation. The Munsell Soil Color Charts were developed to assign values to these colors to simplify classification. The Munsell system uses three components in assigning color to a soil: hue, value, and chroma:

Hue: Related to one of the main spectral colors: red, yellow, green, blue, or purple, or various mixtures of these principal colors;

Value: Refers to the degree of lightness;

Chroma: Indicates the color strength or purity.

In mineral soils, two or more colors may exist within the same soil. The dominant color is referred to as the matrix while the less dominant is referred to as the mottle. Mottling tends to occur under fluctuating conditions of saturation. Mineral soils are considered hydric if the matrix chroma is 2 or less when mottling is present, or when the matrix chroma is 1 or less if no mottling is present. Other soil characteristics, such as high organic content, gleying, histic epipedons, sulfidic materials, aquic or peraquic moisture regime, root pore linings, and iron or manganese concretions, are also indicators of a hydric soil condition.

The last parameter, wetland hydrology, is present when inundation or saturation of the soil within 6 inches to 18 inches of the surface occurs for a minimum of 7 consecutive days during the growing season. In periods during which inundation or saturation is not present, field indicators are typically used to determine the presence of wetland hydrology. Wetland hydrology field indicators are grouped into two categories: primary indicators and secondary indicators. Primary indicators are typically considered to be robust indicators of wetland hydrology and include, but are not limited to, inundation and saturation (as noted above), water marks, drift lines, sediment deposits, and drainage patterns in the ground layer. Secondary indicators are relatively less robust and include, but are not limited to, the presence of a high frequency of oxidized root channels (i.e., pore linings) near the soil surface, water-stained leaves, local soil survey hydrology data, and various environmental or ecological indicators.

A desktop survey was conducted to develop a preliminary understanding of the possible extent of the wetlands in advance of the field delineation. The desktop survey included a review of available information, including USGS 7.5-foot quadrangle topographic maps, USFWS National Wetlands Inventory (NWI) maps, USDA NRCS soil maps and data, and aerial photographs of the Site.

In the field, wetland delineation involves determining the boundary line between the areas in which the three-wetland parameters are present and where they are not. Using perceived changes in elevation and vegetation as a guide, representative observation points were selected along the apparent border of any potential wetland areas. Soil borings were made to determine the presence of hydric soil and wetland hydrology at each of the observation points. Observations were made on both the suspect wetland and upland side. The boundary between the wetland

and upland was then identified and marked in the field with survey flagging. The field delineation was performed by a Wood wetland scientist on March 19, 2019.

3.0 Results

This section presents the results of the desk-top delineation and the field delineation. **Appendix A** presents photographs of the Site, **Appendix B** presents the wetland delineation datasheets, **Appendix C** presents a list of plant species observed during the delineation effort, and **Appendix D** presents the resume of personnel involved with the field delineation.

Delineation was conducted using routine on-site determination method as described in 1987 Corps Manual. To capture the data points within the project a Trimble Pro XRS GPS unit was carried. This system is real-time GIS grade system with an accuracy of 1 foot horizontally and 1.5 feet vertically.

3.1 USGS Topographic Map

A review of the USGS topographic map for the Site area indicates the nearest watercourses are the Aransas Channel to the east and The Corpus Christi Ship Channel (CCSC) to the south (**Figure 2**). The Site is approximately one mile from the Gulf of Meixco.

3.2 USFWS NWI Map

A review of the USFWS NWI map for the Site indicates the presence of a freshwater emergent wetland habitat on the Site (**Figure 3**). The NWI map shows that the site is bordered to the south and east by estuarine and marine deepwater habitat. The freshwater emergent wetland habitat is located on the northwestern edge of the project boundary.

3.3 USDA Soils

A review of the USDA NRCS soils map for the Site area indicates that Mustang fine sand, 0 to 1 percent slopes, occasionally flooded, frequently ponded occur on the Site (**Figure 4**):

Mustang fine sand (0 to 1 percent slopes) is the dominant soil mapping unit on this Site. Mustang fine sand is found in low areas alogn the coast and are marshy most of the time. This soil hosts abundant amount of native plants and is used as range for cattle. It is classified as poorly drained, negligible runoff class, and is considered hydric.

3.4 FEMA Floodplain Map

A review of the Federal Emergency Management Agency (FEMA) flooplain map for the Site area indicates that part of the site is in a Zone AE and Zone X flood zone (**Figure 5**). Zone AE is considered a 100-year flood location, while Zone X can be either a 500-year flood or outside a 500-year flood area.

3.5 Field Wetland Delineation

The results of the field wetland delineation reveal that as of March 2019, the Site was composed of developed and distrubed lands and Persistent Emergent Wetlands (PEM).

Table 1-2: Coordinates for the Wetlands
Port of Corpus Christi, Corpus Christi,Nueces County, Texas

	Northing	Easting
Wetland 1	27.84694444	-97.06666
Wetland 2	27.84724100	-97.06696

Each of these communities is described below, and the wetland boundaries and upland points are depicted on **Figure 6**.

3.5.1 PEM

Two PEMs were located on the site. One PEM was in a small drainage depression that is 0.0184 acres and a larger habitat that is .312 acres. Below is the description of each sample point of the two PEMs (**Figure 6)**.

The first habitat (0.0184 acres) is located near a previously used parking area approximately 520 feet from CCSC (sampling point W18). This community was dominated by torpedograss (*Panicum repens*, FACW) and cone-cup spikerush (*Eleocharis tuberculosa*, OBL) in the herb stratum. No species were observed in the tree, sapling/shrub, or woody vine stratum. This community was considered to be a hydrophytic vegetation community due to the dominant species.

The representative soil boring collected from the community along the wetland revealed a 0 to 16-inch of 10YR 4/1 loamy sand with 1% distinct 7.5YR 5/8 redoximporhic features. This soil is considered to be hydric.

Field indicators of wetland hydrology observed in this community included surface water (maximum depth of 2 inches) and soil saturation in the upper 12 inches. A water table could not be determined due to the amount of saturation. Due to the dominance of hydrophitic vegetation, presence of hydric soil and wetland hydrology, this location is considered a wetland.

The second habitat (.312 Acres) is located in the central portion of the Site and is approximately 715 feet from the CCSC (sampling point 5). This community was dominated by torpedograss (*Panicum repens*, FACW). No species were observed in the tree, sapling/shrub, or woody vine stratum. This community was considered to be a hydrophytic vegetation community due to the dominant species.

The representative soil boring collected from the community along the wetland revealed a 0 to 13-inch 10YR 4/2 sandy clay surface strata, 3 to 12-inch 10YR 6/2 sand, and 12 to 16-inch 2.5YR 6/1 loamy sand. This soil is considered to be hydric.

Field indicators of wetland hydrology observed in this community included soil saturation in the upper 9 inches. Due to the dominance of hydrophitic vegetation, presence of hydric soil, and wetland hydrology, this location is considered a wetland.

3.5.2 Developed and Disturbed Land

The developed and disturbed land community includes the paved areas (i.e. parking lot and roads). These areas are not vegetated and were not identified as wetland. This property has deconstruction activities being preformed at the time of this wetland delentiation. This involved scrap metal and large machines (backhoes and other vehicles assocated with construction services) being moved and stored on site.

4.0 Summary and Conclusion

A wetland delineation was conducted Harbor Island, Port Arthur, Nueces County, Texas. This wetland delineation was performed in support of the future application to the TCEQ and USACE for Section 404 of the CWA and Section 10 of the Rivers and Harbors Act for the construction of a crude oil export terminal servicing marine berths for VLCCs. The delineation identified the outer boundaries of wetlands as defined by the USACE for the entire property.

The Project Area is located at the convergence of Aransas Pass, the Corpus Christi Ship Channel, and Lydia Ann Channel between Nueces and Aransas Counties, Texas. It is a 254-acre parcel identified by Nueces County as Property ID 2411473 and 241506 owned by PCCA. The project location is located on the portion of Harbor Island that is east of TX-361 and is bordered to the east by the Tributary of the Aransas Pass The coordinates for the approximate center of the Site are presented in the table below.

The results of a preliminary desktop delineation indicated that the site has one freshwater emergent wetland habitat and is bordered by estuarine and marine deep-water habitats. The identified two PEM wetland communities on the Site (**Figure 6**).

The smaller PEM (0.0184 acres) is located near a previously used parking area, approximately 520 feet from CCSC. The second, larger PEM The second habitat (.312 Acres) is located in the central portion of the Site and is approximately 715 feet from the CCSC. The results of this wetland delineation have not yet been reviewed by the any government authority, and as such, should be considered preliminary until confirmation of the boundaries and resource classification (i.e. ordinary, intermediate, and exceptional) has been received.

4.0 Summary and Conclusion

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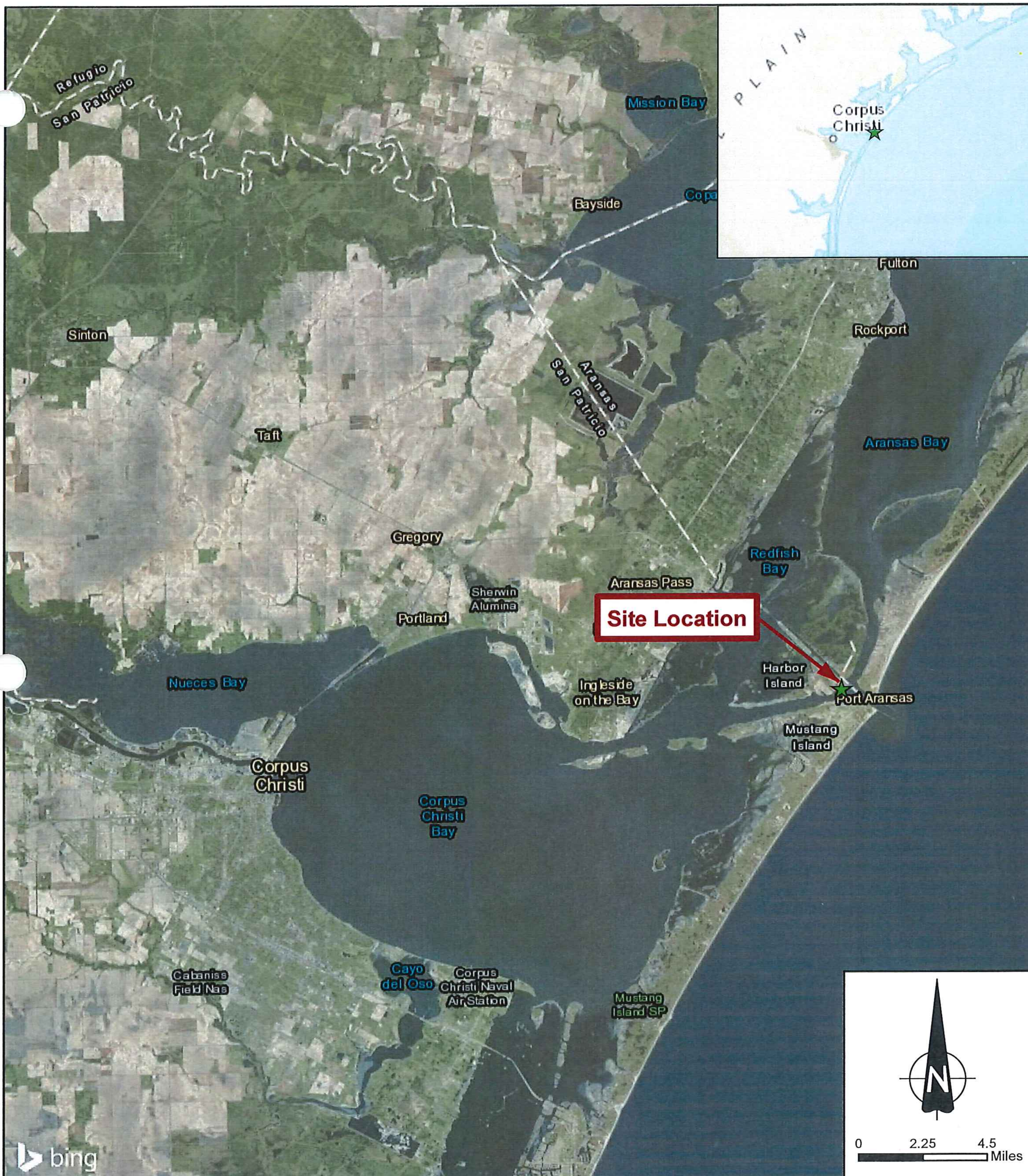
FIGURES



Port Of Corpus Christi Authority of Nueces County	★ Site Location	Project Location	DATE JUNE 2019
			SCALE 1 " = 5 miles
wood.			PROJECT NO. 6703180051
			FIGURE 1

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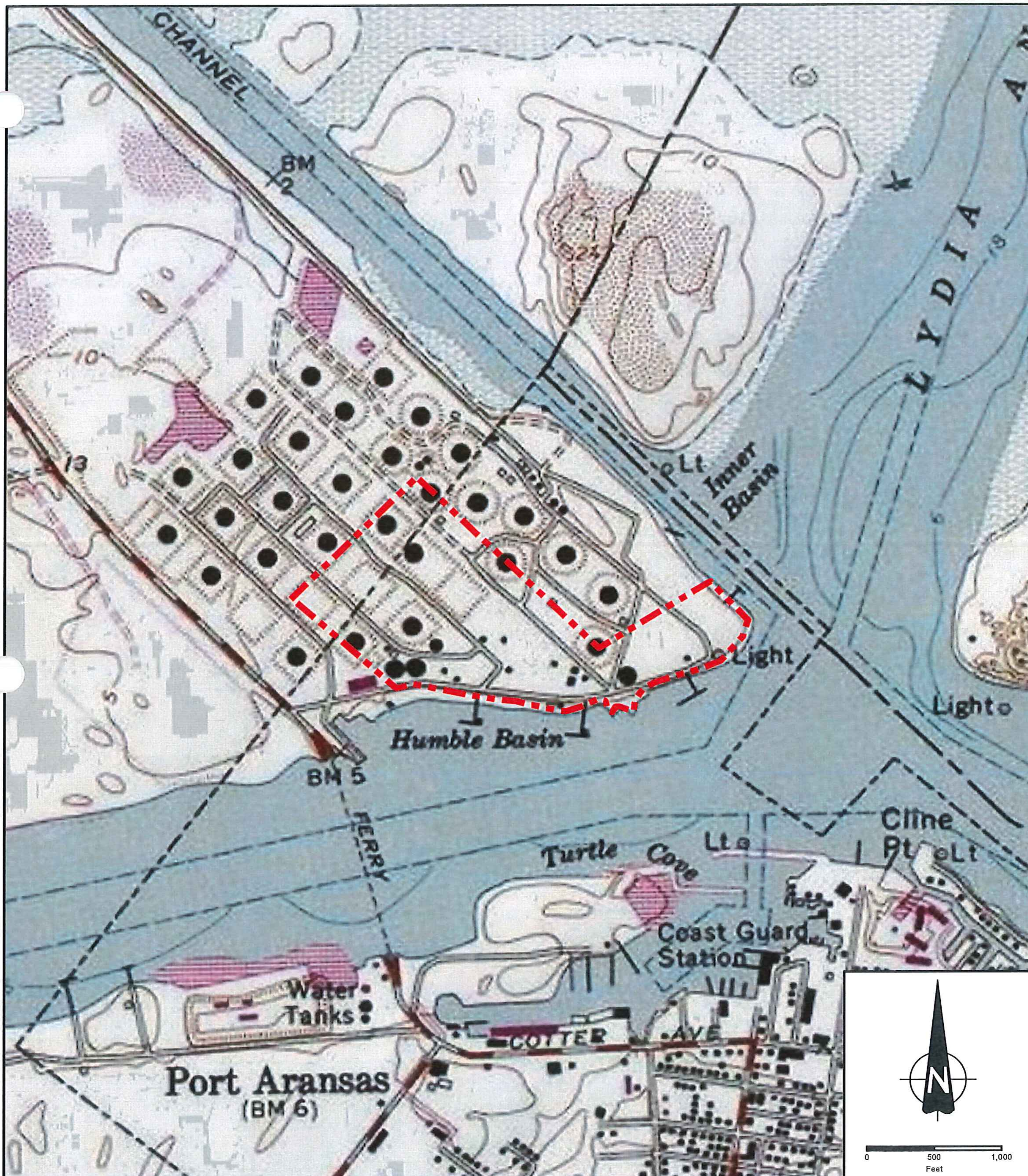
\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\EIS_Projects\POCC\03_Exhibits\13_SECTION 10 - POCCA FIGURES\01_SITE_LOCATION\2019_03_26\SITE_LOCATION.mxd - stacy.brooks - 6/12/2019 - 8:27:09 AM



Port Of Corpus Christi Authority of Nueces County

wood.

Project Boundary

Topographic Map

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

DATE
JUNE 2019

SCALE
1 " =1,000 '

PROJECT NO.
6703180030

FIGURE
2

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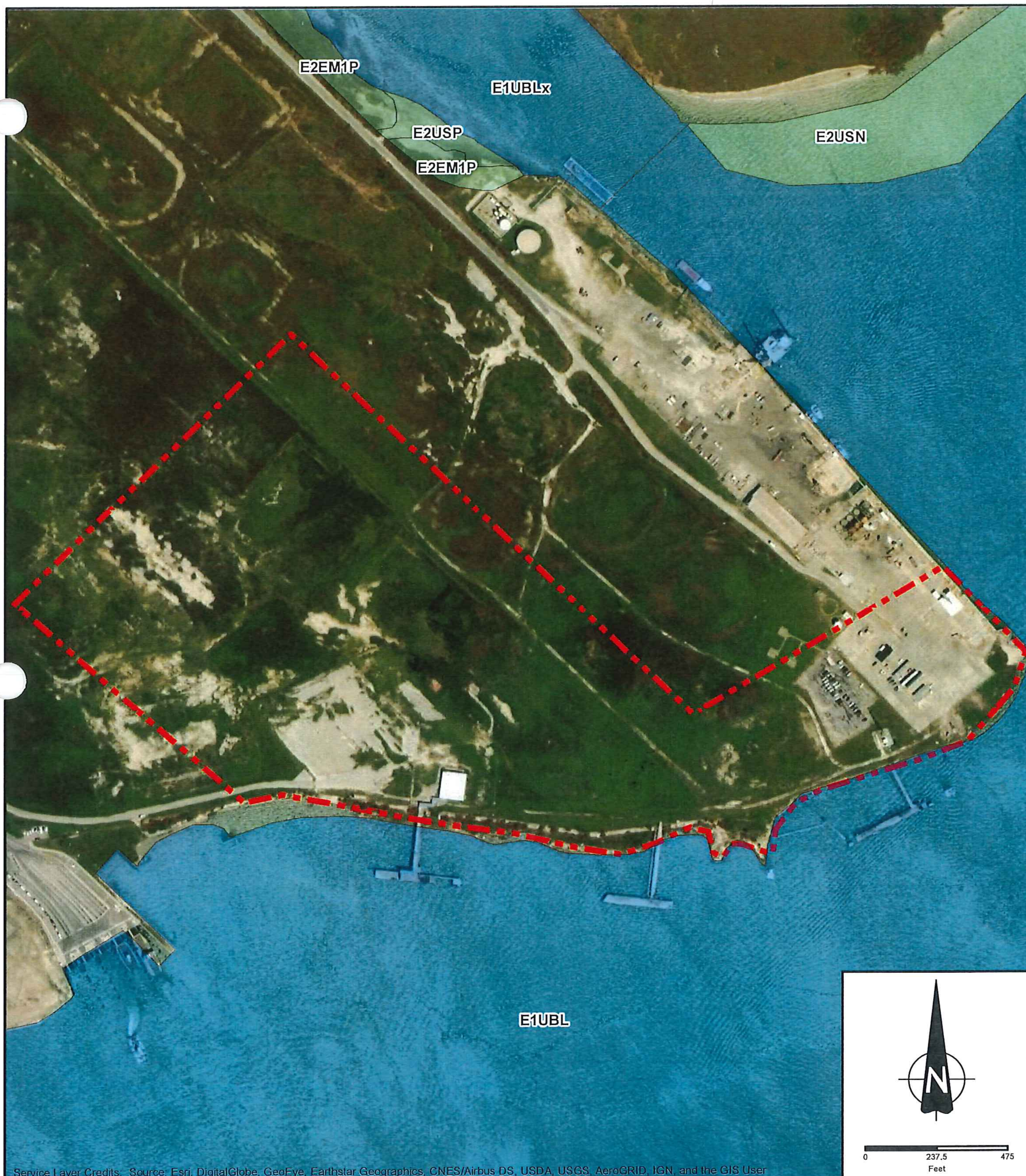

Port Of Corpus Christi Authority of Nueces County	Project Boundary	U.S. Fish & Wildlife Service National Wetlands Inventory Map	DATE JUNE 2019
	Estuarine & Marine Deepwater		SCALE 1 " =450 '
wood.	Estuarine & Marine Wetland		PROJECT NO. 6703180030
			FIGURE 3

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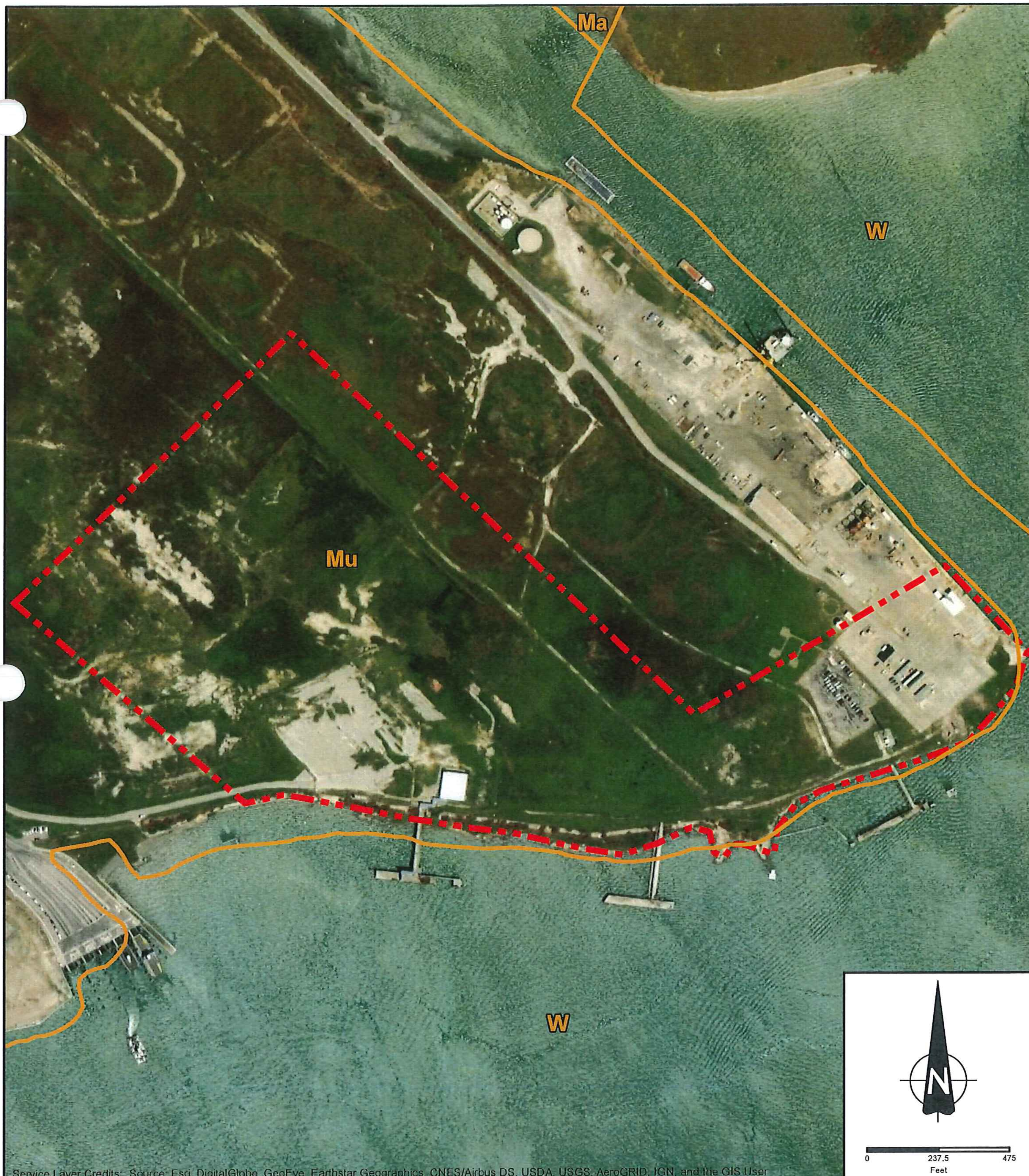

Port Of Corpus Christi Authority of Nueces County	Project Boundary Mu - Mustang fine sand, 0 to 1 percent slopes, occasionally flooded, frequently ponded W - Water	U.S. Department of Agriculture Soil Survey Map	DATE	JUNE 2019
			SCALE	1 " =450 '
wood.			PROJECT NO.	6703180030
			FIGURE	4

DRAWN BY: SD CHECKED BY:

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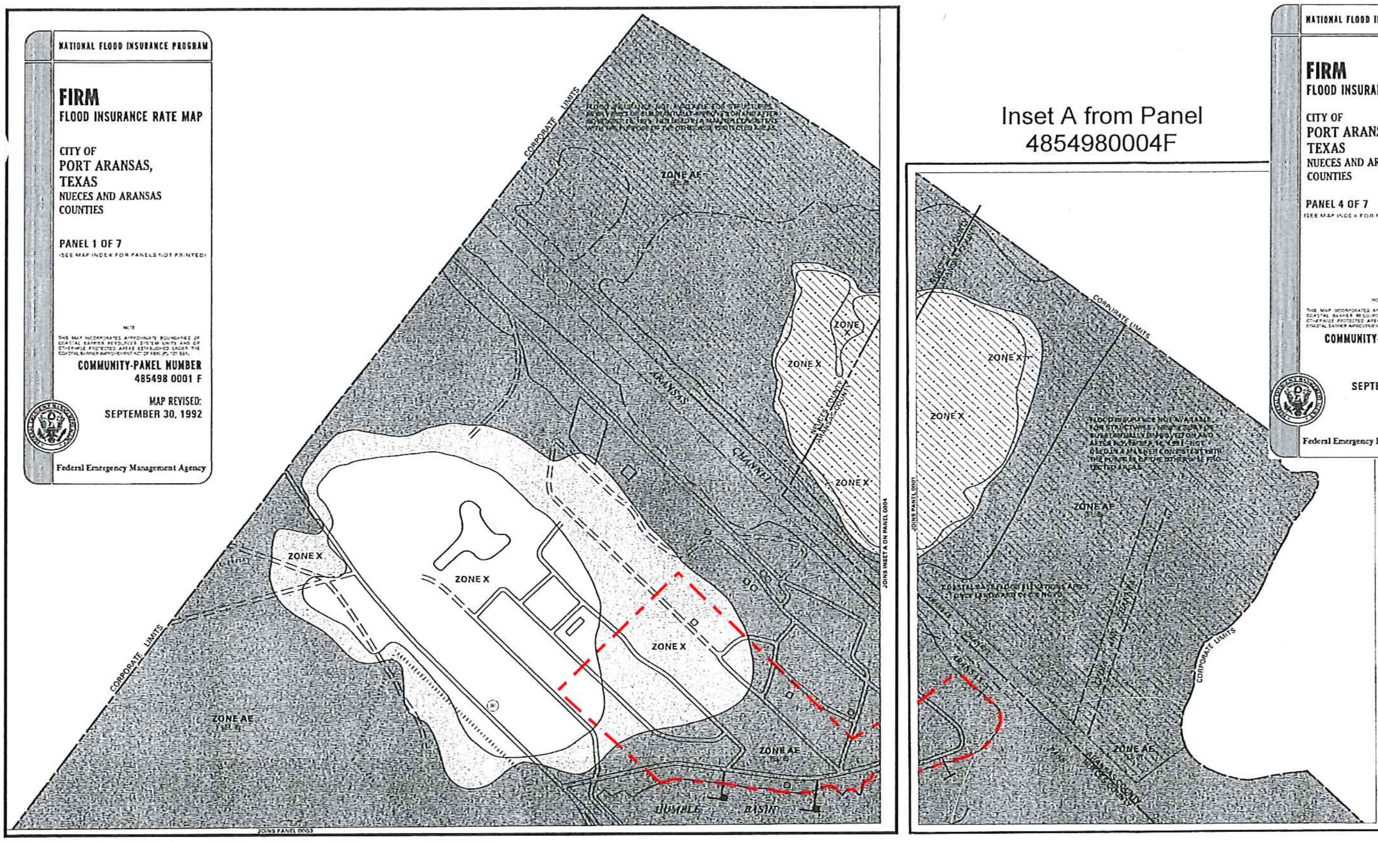

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A	No base flood elevations determined.
ZONE AE	Base flood elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding; velocities also determined.
ZONE A99	To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
ZONE V	Coastal flood with velocity hazard (wave action); no base flood elevations determined.
ZONE VE	Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X	Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X	Areas determined to be outside 500-year floodplain.
ZONE D	Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 — Identified 1990 — Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

~~~~513~~~~ Base Flood Elevation Line; Elevation in Feet*

(D)——(D) Cross Section Line

(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7x Elevation Reference Mark

•M1.5 River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

Port Aransas City Hall, 710 West Avenue Way, Port Aransas, Texas 78373

(Maps available for reference only, not for distribution).

INITIAL IDENTIFICATION:

JUNE 26, 1971

FLOOD HAZARD BOUNDARY MAP REVISIONS:

NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:

JUNE 26, 1971

FLOOD INSURANCE RATE MAP REVISIONS:

September 8, 1972 - to change base flood elevations.

November 23, 1973 - to add zones.

July 1, 1974 - to change zone designations.

August 13, 1976 - to reflect curvilinear flood boundary, to change community boundary, and to add special flood hazard areas.

December 8, 1976 - to change base flood elevations.

March 18, 1985 - to increase and decrease base flood elevations, to increase zone designations, to revise special flood hazard areas, and to revise corporate limits.

September 30, 1992 - to update corporate limits, to increase base flood elevations, to change special flood hazard areas, to update map format, to reflect updated topographic information and to add otherwise protected areas.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

N

Port Of Corpus Christi Authority of Nueces County

wood.

Project Boundary

FEMA Floodplain Map

DATE	JUNE 2019
SCALE	Not to Scale
PROJECT NO.	6703180030
FIGURE	5

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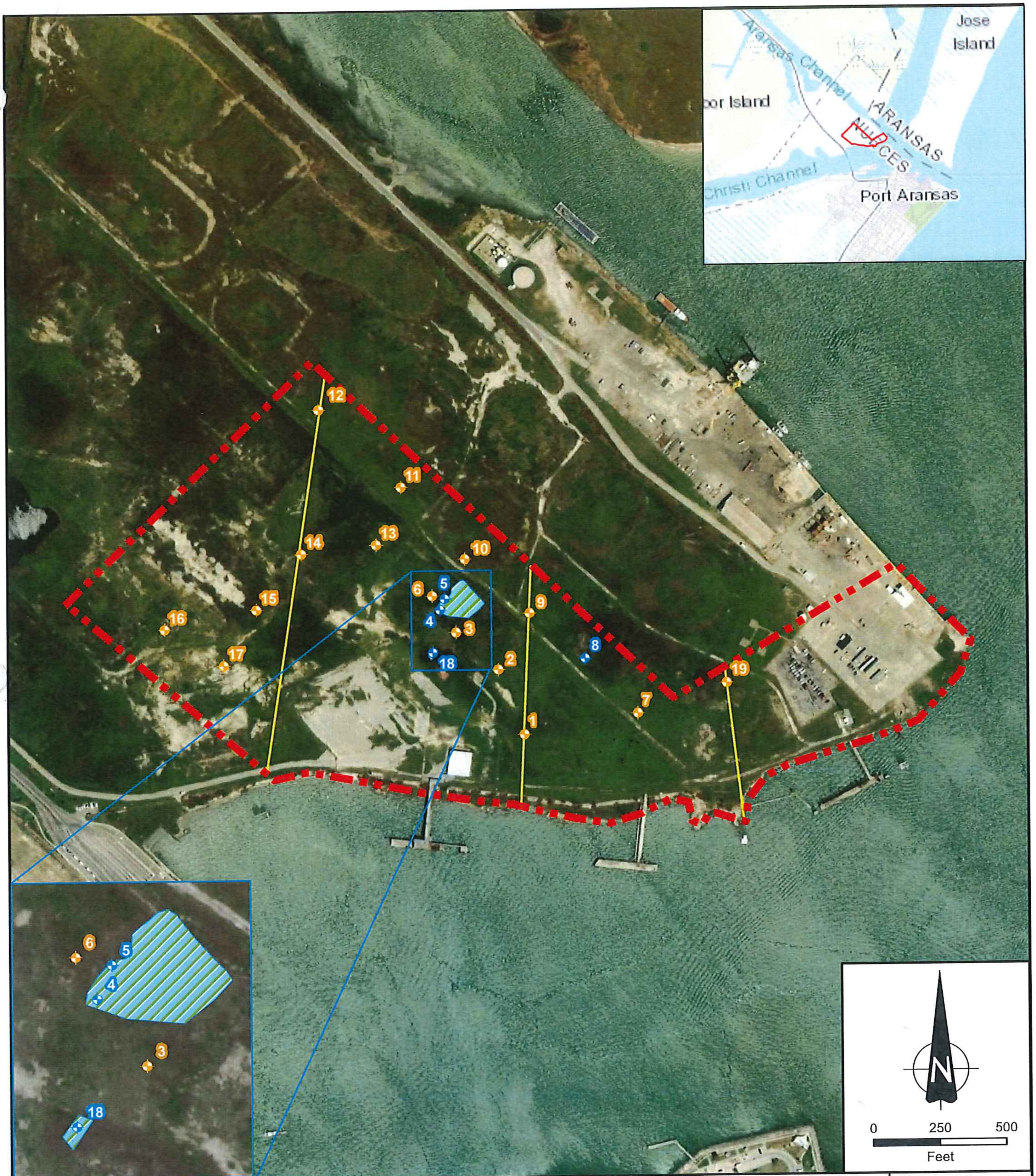

Port Of Corpus Christi Authority of Nueces County

wood.

Upland Point

Wetland Point

Project Boundary

Transects

Wetlands

Wetland Boundary Map

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI,

DATE	JUNE 2019
SCALE	1 " = 500 '
PROJECT NO.	6703180030
FIGURE	6

DRAWN BY: SD CHECKED BY: K

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APPENDIX A

Photographs

PHOTO 1:

Sample Point 1:
27.84579415
-97.0659235

Photograph facing northeast.

PHOTO 2:

Sample Point 1:
27.845776
-97.065925

Photograph facing west.

PHOTO 3:

Sample Point 1:
27.845776
-97.065926

Photograph facing northwest.

PHOTO 4:

Sample Point 2:
27.846435
-97.066169

Photograph facing northeast.

PHOTO 5:

Sample Point 2:
27.846451
-97.066192

Photograph facing west.

PHOTO 6:

Sample Point 2:
27.846453
-97.066195

Photograph facing north.

PHOTO 7:

Sample Point 3:
27.846886
-97.06671

Photograph facing north.

PHOTO 8:

Sample Point 3:
27.846907
-97.066721

Photograph facing west.

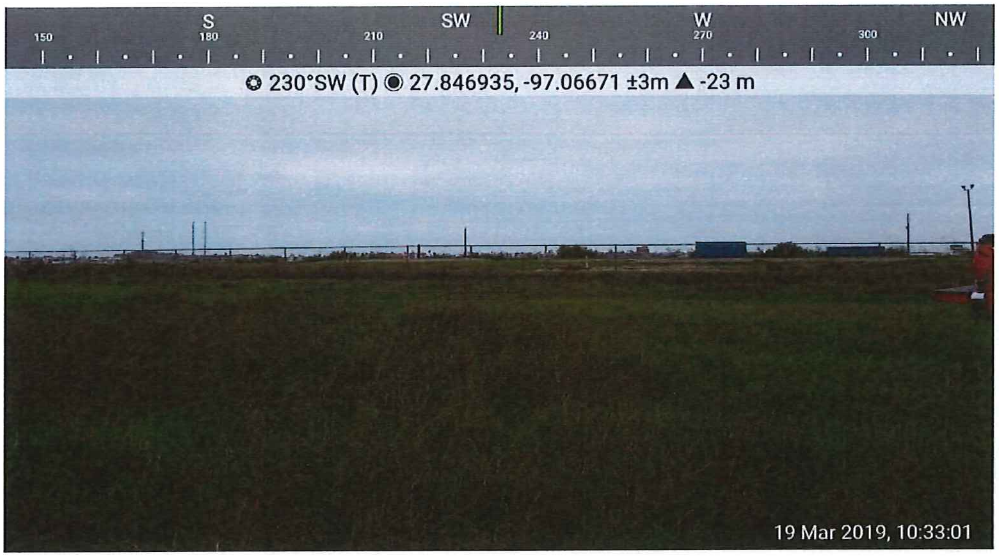

PHOTO 9:

Sample Point 3:
27.846935
-97.06671

Photograph facing southwest.

PHOTO 10:

Sample Point 3:
27.846935
-97.06671

Photograph facing southwest.

PHOTO 11:

Sample Point 4:
27.84712500
-97.066769

Photograph facing southwest.

PHOTO 12:

Sample Point 5:
27.847217
-97.066811

Photograph facing east.

PHOTO 13:

Sample Point 5:
27.847217
-97.066811

Photograph facing west.

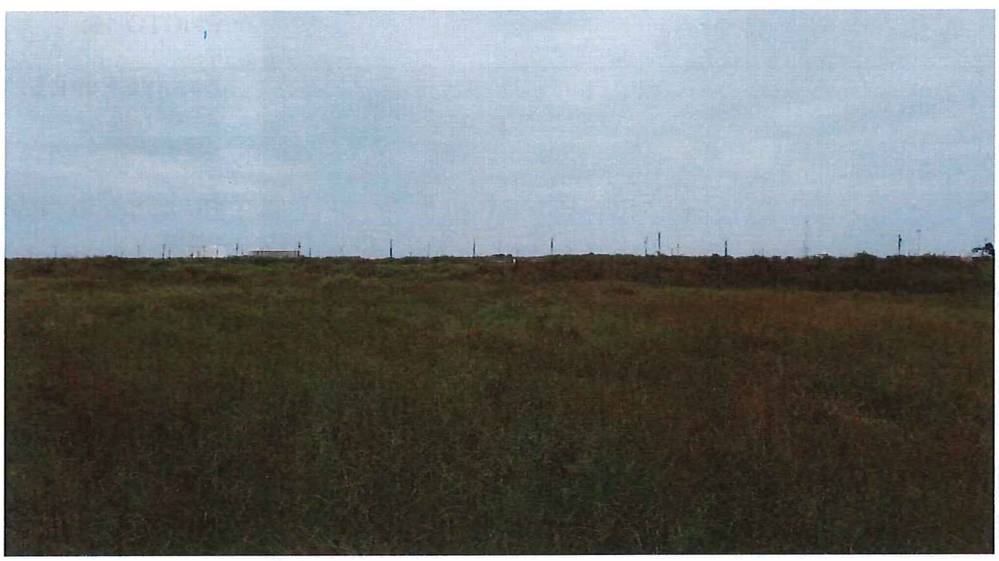

PHOTO 14:

Sample Point 6:
27.847266
-97.066943

Photograph facing north.

PHOTO 15:

Sample Point 6:
27.847266
-97.066943

Photograph facing east.

PHOTO 16:

Sample Point 6:
27.847265
-97.066944

Photograph facing west.

PHOTO 17:

Sample Point 7:
27.846009
-97.064602

Photograph facing north.

PHOTO 18:

Sample Point 7:
27.846009
-97.064602

Photograph facing east.

PHOTO 19:

Sample Point 7:
27.846011
-97.064602

Photograph facing west.

PHOTO 20:

Sample Point 8:
27.846588
-97.065192

Photograph facing north.

PHOTO 21:

Sample Point 8:
27.846577
-97.065209

Photograph facing east.

PHOTO 22:

Sample Point 8:
27.846577
-97.065209

Photograph facing west.

PHOTO 23:

Sample Point 10:
27.847646
-97.066556

Photograph facing north.

PHOTO 24:

Sample Point 10:
27.847646
-97.066556

Photograph facing west.

PHOTO 25:

Sample Point 11:
27.84842
-97.067287

Photograph facing northwest.

PHOTO 26:

Sample Point 11:
27.84842
-97.067287

Photograph facing north.

PHOTO 27:

Sample Point 11:
27.848425
-97.067282

Photograph facing east.

PHOTO 28:

Sample Point 12:
27.849249
-97.06821

Photograph facing southeast.

PHOTO 29:

Sample Point 12:
27.849249
-97.06821

Photograph facing north.

PHOTO 30:

Sample Point 12:
27.84925
-97.068208

Photograph facing west.

PHOTO 31:

Sample Point 13:
27.847859
-97.067555

Photograph facing west.

PHOTO 32:

Sample Point 13:
27.847859
-97.067555

Photograph facing north.

PHOTO 33:

Sample Point 13:
27.847853
-97.067554

Photograph facing east.

PHOTO 34:

Sample Point 14:
27.847744
-97.068421

Photograph facing north.

PHOTO 35:

Sample Point 14:
27.847729
-97.068426

Photograph facing northwest.

PHOTO 36:

Sample Point 14:
27.847729
-97.068426

Photograph facing west.

PHOTO 37:

Sample Point 15:
27.847337
-97.069051

Photograph facing north.

PHOTO 38:

Sample Point 15:
27.847337
-97.069051

Photograph facing west.

PHOTO 39:

Sample Point 15:
27.847336
-97.069089

Photograph facing south.

PHOTO 40:

Sample Point 16:
27.847007
-97.070052

Photograph facing north.

PHOTO 41:

Sample Point 16:
27.847007
-97.070052

Photograph facing east.

PHOTO 42:

Sample Point 16:
27.847001
-97.070055

Photograph facing west.

PHOTO 43:

Sample Point 17:
27.846541
-97.069355

Photograph facing west.

PHOTO 44:

Sample Point 17:
27.846541
-97.069355

Photograph facing south.

PHOTO 45:

Sample Point 17:
27.846541
-97.069355

Photograph facing north.

PHOTO 46:

Sample Point 18:
27.846535
-97.067032

Photograph facing northwest.

PHOTO 47:

Sample Point 18:
27.846535
-97.067032

Photograph facing northeast.

PHOTO 48:

Sample Point 18:
27.846535
-97.067032

Photograph facing west.

APPENDIX B
Wetland Delineation Datasheets

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 1

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84579415 Long: -97.06592535 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 ___ No X	
Hydric Soil Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** Yes ___ No X
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ___ No X	Depth (inches): ___	
Water table present?	Yes ___ No X	Depth (inches): ___	
Saturation present? (includes capillary fringe)	Yes ___ No X	Depth (inches): ___	**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 1

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapliing/Shrub Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Cynodon dactylon*	65	Y	FACU
2 *Houstonia pusilla*	20	Y	FACU
3 *Coreopsis basalis*	20	Y	UPL
4 *Sorghum halepense*	15	N	FACU
5 *Medicago polymorpha*	10	N	FACU
6 *Oenothera grandis*	5	N	UPL
7 *Lepidium virginicum*	2	N	UPL
8			
9			
10			
11			
12			
	137	= Total Cover	
50% of total cover: 68.5		20% of total cover: 27.4	

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	110	x 4 =	440
UPL species	27	x 5 =	135
Column totals	137 (A)		575 (B)

Prevalence Index = B/A = 4.20

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-9	10YR 5 / 3	98	7.5YR 5 8	2	C	PL	Loamy Sand	
9-12	10YR 4 / 1	85	7.5YR 4 / 4	15	C	PL	Sandy Loam	
12-15	10YR 4 / 1	85	5YR 4 / 6	15	C	PL	Sandy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
__ Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
__ Sandy Gleyed Matrix (S4)
X 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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island   City/County: Nuece County   Sampling Date: March 19, 2019

Applicant/Owner: POCCA   State: TX   Sampling Point: 2

Investigator(s): Ashley Bogrand, Orlando Recio   Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie   Local relief (concave, convex, none): None   Slope (%): 0

Subregion (LRR or MLRA): LRR T   Lat: 27.84675000   Long: -97.066218   Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent   NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ____	No X	Depth (inches): ____
Water table present?	Yes ____	No X	Depth (inches): ____
Saturation present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 2

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapling/Shrub Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Cynodon dactylon*	80	Y	FACU
2 *Coreopsis basalis*	40	Y	UPL
3 *Sonchus asper*	10	N	FACU
4 *Thymophylla tenuiloba*	5	N	UPL
5 *Vicia sativa*	5	N	FACU
6			
7			
8			
9			
10			
11			
12			
	140	= Total Cover	
50% of total cover: 70		20% of total cover: 28	

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	95	x 4 =	380
UPL species	45	x 5 =	225
Column totals	140 (A)		605 (B)

Prevalence Index = B/A = 4.32

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-8	10YR 5 / 2	93	5YR 5 / 8	7	C	PL	Sandy Loam	
8-14	10YR 4 / 2	90	7.5YR 5 / 6	10	C	PL	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
X Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
__ Sandy Gleyed Matrix (S4)
X 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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 3

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84690100 Long: -97.066684 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 X No ___	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ___ No X	Depth (inches): ___	
Water table present?	Yes ___ No X	Depth (inches): ___	
Saturation present? (includes capillary fringe)	Yes ___ No X	Depth (inches): ___	**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 3

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapliing/Shrub Stratum (Plot Size: 30')			
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 30')			
1 *Panicum repens*	70	Y	FACW
2 *Eleocharis tuberculosa*	40	Y	OBL
3 *Nothoscordum bivalve*	10	N	FACU
4			
5			
6			
7			
8			
9			
10			
11			
12			
	120	= Total Cover	
50% of total cover: 60		20% of total cover: 24	

Woody Vine Stratum (Plot Size: 30')			
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:	
OBL species	40	x 1 =	40	
FACW species	70	x 2 =	140	
FAC species	0	x 3 =	0	
FACU species	10	x 4 =	40	
UPL species	0	x 5 =	0	
Column totals	120	(A)	220	(B)

Prevalence Index = B/A = 1.83

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ___

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

SOIL

Sampling Point: 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-4	10YR 3 / 2	100					Sandy Clay Loam	
4-9	2.5YR 7 / 1	95	5YR 5 / 8	5	C	PL	Sandy Loam	
9-12	10YR 3 / 1	95	7.5YR 4 / 6	5	C	PL	Loamy Sand	
12-16	10YR 6 / 2	98	10YR 7 / 8	2	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
__ Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
__ Sandy Gleyed Matrix (S4)
X 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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 4

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84712500 Long: -97.066869 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 X No ___	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ___	No X	Depth (inches): ___
Water table present?	Yes ___	No X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 4

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Sapliing/Shrub Stratum (Plot Size: 30')			
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Herb Stratum (Plot Size: 30')			
1 *Panicum repens*	60	Y	FACW
2 *Eleocharis tuberculosa*	35	Y	OBL
3 *Schoenoplectus americanus*	7	N	OBL
4 *Vicia sativa*	2	N	FACU
5			
6			
7			
8			
9			
10			
11			
12			
	104	= Total Cover	
50% of total cover: 52		20% of total cover:	20.8

Woody Vine Stratum (Plot Size: 30')			
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across all Strata:	2	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	100.00%	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	42	x 1 =	42
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column totals	104 (A)		170 (B)

Prevalence Index = B/A = 1.63

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ____

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

SOIL

Sampling Point: 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-1	10YR 4 / 2	100					Loamy Sand	
1-9	10YR 5 / 2	95	7.5YR 4 / 6	5	C	PL	Loamy Sand	
9-11	10YR 4 / 2	100					Loamy Sand	Shells and Debris
11-16	10YR 5 / 1	95	7.5YR 4 / 6	5	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
X Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
__ Sandy Gleyed Matrix (S4)
X 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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 5

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 27.84724100 Long: -97.066814 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of the 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 X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ___ No X	Depth (inches): ___	
Water table present?	Yes ___ No X	Depth (inches): ___	
Saturation present? (includes capillary fringe)	Yes X No ___	Depth (inches): 9	**Wetland Hydrology Present?** Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 5

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapliing/Shrub Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 ***Panicum repens***	99	Y	FACW
2 ***Eleocharis tuberculosa***	10	N	OBL
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
	109	= Total Cover	
50% of total cover: 54.5		20% of total cover: 21.8	

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	99	x 2 =	198
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	109 (A)		208 (B)

Prevalence Index = B/A = 1.91

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ___

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

SOIL

Sampling Point: 5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-3	10YR 4 / 2	100					Sandy Clay	
3-12	10YR 6 / 2	100					Sand	
12-16	2.5YR 6 / 1	100					Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019
Applicant/Owner: POCCA State: TX Sampling Point: 6
Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None
Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR T Lat: 27.84727300 Long: -97.066953 Datum: NAD83
Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of the 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 ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ____ No X	Depth (inches): ____	
Water table present?	Yes ____ No X	Depth (inches): ____	
Saturation present? (includes capillary fringe)	Yes ____ No X	Depth (inches): ____	**Wetland Hydrology Present?** Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 6

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapling/Shrub Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Schizachyrium scoparium*	90	Y	FACU
2 *Vicia sativa*	10	N	FACU
3 *Sisyrinchium langloisii*	2	N	UPL
4			
5			
6			
7			
8			
9			
10			
11			
12			
	102	= Total Cover	
50% of total cover: 51		20% of total cover: 20.4	

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	0	x 3 = 0
FACU species	100	x 4 = 400
UPL species	2	x 5 = 10
Column totals	102 (A)	410 (B)

Prevalence Index = B/A = 4.02

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-2	10YR 5 / 2	100					Loamy Sand	
2-10	10YR 7 / 3	97	10YR 6 / 8	3	C	PL	Loamy Sand	
10-15	10YR 6 / 2	98	10YR 5 / 6	2	C	PL	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- __ Histisol (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 Suface (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)
- X 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[3]:

- __ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019
Applicant/Owner: POCCA State: TX Sampling Point: 7
Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None
Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR T Lat: 27.84599500 Long: -97.064603 Datum: NAD83
Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of the 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 ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

__ Surface Water (A1)	__ Aquatic Fauna (B13)	
__ High Water Table (A2)	__ Marl Deposits (B15) **(LRR U)**	
__ Saturation (A3)	__ Hydrogen Sulfide Odor (C1)	
__ Water Marks (B1)	__ Oxidized Rhizospheres on Living Roots (C3)	
__ Sediment Deposits (B2)	__ Presence of Reduced Iron (C4)	
__ Drift Deposits (B3)	__ Recent Iron Reduction in Tilled Soils (C6)	
__ Algal Mat or Crust (B4)	__ Thin Muck Surface (C7)	
__ Iron Deposits (B5)	__ Other (Explain in Remarks)	
__ Inundation Visible on Aerial Imagery (B7)		
__ Water-Stained Leaves (B9)		

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)
- __ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ____	No X	Depth (inches): ____
Water table present?	Yes ____	No X	Depth (inches): ____
Saturation present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 7

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	
Sapliing/Shrub Stratum (Plot Size: 15')			
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	
Herb Stratum (Plot Size: 5')			
1 *Anagallis arvensis*	70	Y	FACU
2 *Arundo donax*	20	Y	FAC
3 *Vicia sativa*	4	N	FACU
4			
5			
6			
7			
8			
9			
10			
11			
12			
	94	= Total Cover	
50% of total cover: 47		20% of total cover: 18.8	
Woody Vine Stratum (Plot Size: 30')			
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	20	x 3 =	60	
FACU species	74	x 4 =	296	
UPL species	0	x 5 =	0	
Column totals	94	(A)	356	(B)

Prevalence Index = B/A = 3.79

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-2	10YR 5 / 2	100					Loamy Sand	
2-10	10YR 7 / 3	97	10YR 6 / 8	3	C	PL	Loamy Sand	
10-15	10YR 6 / 2	98	10YR 5 / 6	2	C	PL	Sandy Loam	
	/							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
__ Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
__ Sandy Gleyed Matrix (S4)
X 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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 8

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 27.84657400 Long: -97.065198 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 X No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ Aquatic Fauna (B13)	
___ High Water Table (A2)	___ Marl Deposits (B15) **(LRR U)**	
___ Saturation (A3)	___ Hydrogen Sulfide Odor (C1)	
___ Water Marks (B1)	___ Oxidized Rhizospheres on Living Roots (C3)	
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	
___ Drift Deposits (B3)	___ Recent Iron Reduction in Tilled Soils (C6)	
___ Algal Mat or Crust (B4)	___ Thin Muck Surface (C7)	
___ Iron Deposits (B5)	___ Other (Explain in Remarks)	
___ Inundation Visible on Aerial Imagery (B7)		
___ Water-Stained Leaves (B9)		

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ____ No X	Depth (inches): ____	
Water table present?	Yes ____ No X	Depth (inches): ____	
Saturation present? (includes capillary fringe)	Yes ____ No X	Depth (inches): ____	**Wetland Hydrology Present?** Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 8

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapliing/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Panicum repens*	80	Y	FACW
2 *Eleocharis tuberculosa*	25	Y	OBL
3 *Vicia sativa*	4	N	FACU
4			
5			
6			
7			
8			
9			
10			
11			
12			
	109	= Total Cover	
50% of total cover: 54.5		20% of total cover: 21.8	

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	80	x 2 =	160
FAC species	0	x 3 =	0
FACU species	4	x 4 =	16
UPL species	0	x 5 =	0
Column totals	109 (A)		201 (B)

Prevalence Index = B/A = 1.84

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ___

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

SOIL

Sampling Point: 8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-2	10YR 2 / 2	99	7.5YR 5 / 8	1	C	PL	Loamy Sand	
2-6	10YR 4 / 2	99	7.5YR 5 / 8	1	C	PL	Loamy Sand	
6-7	Gley 1 4 / 10Y	90	7.5YR 4 / 6	10	C	PL	Sandy Clay	
7-16	10YR 2 / 2	100					Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
__ Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
X Sandy Gleyed Matrix (S4)
X 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)**
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019
Applicant/Owner: POCCA State: TX Sampling Point: 9
Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None
Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR T Lat: 27.84705400 Long: -97.065785 Datum: NAD83
Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of the 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.

	Yes	No	
Hydrophytic Vegetation Present?		X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	X		
Wetland Hydrology Present?		X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

	Yes	No	Depth (inches)
Surface water present?		X	
Water table present?		X	
Saturation present? (includes capillary fringe)		X	

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 9

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Sapliing/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Cynodon dactylon*	80	Y	FACU
2 *Andropogon gerardii*	40	Y	FAC
3 *Andropogon glomeratus*	20	N	FACW
4 *Anagallis arvensis*	20	N	FACU
5 *Taraxacum officinale*	10	N	FACU
6 *Linum berlandieri*	5	N	UPL
7			
8			
9			
10			
11			
12			
	175	= Total Cover	
50% of total cover: 87.5		20% of total cover:	35

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across all Strata:	2	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	50.00%	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	40	x 3 =	120
FACU species	110	x 4 =	440
UPL species	5	x 5 =	25
Column totals	175 (A)		625 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-6	10YR 4 / 2	98	7.5YR 5 / 8	2	C	PL	Loamy Sand	
6-7	Gley 2 6 / 8	95	5YR 4 / 6	5	C	PL	Clay Loam	
7-16	10YR 4 / 2	98	7.5YR 5 / 8	2	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
__ Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
X Sandy Gleyed Matrix (S4)
X 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)**
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 10

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.94765500 Long: -97.066561 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of the 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 X	No ___	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ___	No X	Depth (inches): ___
Water table present?	Yes ___	No X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 10

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Eleocharis tuberculosa*	60	Y	OBL
2 *Schoenoplectus americanus*	10	N	OBL
3 *Sisyrinchium langloisii*	4	N	UPL
4			
5			
6			
7			
8			
9			
10			
11			
12			
	74 = Total Cover		
50% of total cover: 37	20% of total cover: 14.8		

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	4	x 5 =	20
Column totals	74 (A)		90 (B)

Prevalence Index = B/A = 1.22

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ___

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

SOIL

Sampling Point: 10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-1	10YR 4 / 3	100					Loamy Sand	
1-2	2.5YR 5 / 1	98	7.5YR 5 / 6	2	C	PL	Sandy Clay	
2-10	10YR 4 / 3	99	Gley 1 7 / 5	1	C	PL	Sandy Clay	Gley1 7/5G
10-16	10YR 6 / 1	100					Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 11

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84842800 Long: -97.067285 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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.

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?	X	
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

	Yes	No	Depth (inches)
Surface water present?		X	
Water table present?		X	
Saturation present? (includes capillary fringe)		X	

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 11

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Sapliing/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Andropogon gerardii*	90	Y	FAC
2 *Anagallis arvensis*	35	Y	FACU
3 *Nothoscordum bivalve*	10	N	FACU
4			
5			
6			
7			
8			
9			
10			
11			
12			
	135	= Total Cover	
50% of total cover: 67.5		20% of total cover:	27

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	90	x 3 =	270	
FACU species	45	x 4 =	180	
UPL species	0	x 5 =	0	
Column totals	135	(A)	450	(B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-2	7.5YR 3 / 1	98	7.5YR 4 / 4	2	C	PL	Loamy Sand	
2-9	10YR 5 / 1	92	7.5YR 4 / 6	8	C	PL	Loamy Sand	
9-11	7.5YR 2.5 / 1	85	5YR 4 / 6	15	C	PL	Sandy Clay	
11-15	7.5YR 6 / 1	85	7.5YR 5 / 8	15	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- __ Histisol (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 Suface (A11)
- __ Thick Dark Surface (A12)
- __ Coast Prairie Redox (A16) **(MLRA 150A)**
- __ Sandy Mucky Mineral (S1) **(LRR O, S)**
- __ Sandy Gleyed Matrix (S4)
- X 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)
- X 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[3]:

- __ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 12

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84926800 Long: -97.068213 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 X No ___	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ___	No X	Depth (inches): ___
Water table present?	Yes ___	No X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 12

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Sapling/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Andropogon gerardii*	98	Y	FAC
2 *Anagallis arvensis*	30	N	FACU
3 *Vicia sativa*	30	N	FACU
4 *Gonolobus suberosus*	5	N	FACW
5			
6			
7			
8			
9			
10			
11			
12			
	163	= Total Cover	
50% of total cover: 81.5		20% of total cover:	32.6

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	98	x 3 =	294
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column totals	163 (A)		544 (B)

Prevalence Index = B/A = 3.34

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ___

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

SOIL

Sampling Point: 12

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
1-14	10YR 4 / 2	95	5YR 4 / 6	5	C	PL	Sandy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 13

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84782600 Long: -97.067601 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 X No ____	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ____ No X	Depth (inches): ____	
Water table present?	Yes ____ No X	Depth (inches): ____	
Saturation present? (includes capillary fringe)	Yes ____ No X	Depth (inches): ____	**Wetland Hydrology Present? Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 13

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Sapliing/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Panicum repens*	100	Y	FACW
2 *Eleocharis tuberculosa*	70	Y	OBL
3 *Schoeneoplectus americanus*	10	N	
4 *Nothoscordum bivalve*	5	N	FACU
5			
6			
7			
8			
9			
10			
11			
12			
	185	= Total Cover	
50% of total cover: 92.5		20% of total cover:	37

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column totals	175 (A)		290 (B)

Prevalence Index = B/A = 1.66

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ___

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

SOIL

Sampling Point: 13

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-7	10YR 5 / 4	98	7.5YR 5 / 8	2	C	PL	Loamy Sand	
7-13	10YR 4 / 1	95	7.5YR 6 / 8	5	C	PL	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (A11)
__ Thick Dark Surface (A12)
__ Coast Prairie Redox (A16) **(MLRA 150A)**
__ Sandy Mucky Mineral (S1) **(LRR O, S)**
__ Sandy Gleyed Matrix (S4)
X 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)
X 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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 14

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84776900 Long: -97.06847 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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.

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?	X	
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

	Yes	No	Depth (inches)
Surface water present?		X	
Water table present?		X	
Saturation present? (includes capillary fringe)		X	

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 14

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Cynodon dactylon*	75	Y	FACU
2 *Coreopsis basalis*	30	Y	UPL
3 *Erigeron pulchellus*	5	N	FACU
4 *Eleocharis tuberculosa*	3	N	OBL
5 *Polygala polygama*	3	N	FACU
6			
7			
8			
9			
10			
11			
12			
	116 = Total Cover		
50% of total cover: 58	20% of total cover: 23.2		

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	3	x 1 =	3
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	83	x 4 =	332
UPL species	30	x 5 =	150
Column totals	116 (A)		485 (B)

Prevalence Index = B/A = 4.18

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 14

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-8	10YR 5 / 4	98	7.5YR 4 / 6	2	C	PL	Loamy Sand	
8-15	10YR 7 / 1	99	7.5YR 6 / 8	1	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- __ Histisol (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 Suface (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)
- X 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[3]:

- __ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 15

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84717100 Long: -97.069007 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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.

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?		X
Wetland Hydrology Present?	X	

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

	Yes	No	Depth (inches)
Surface water present?		X	
Water table present?		X	
Saturation present? (includes capillary fringe)		X	

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 15

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapliing/Shrub Stratum (Plot Size: 15')			
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 5')			
1 *Carex nigromarginata*	25	Y	FACU
2 *Eleocharis tuberculosa*	1	N	OBL
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
	26	= Total Cover	
50% of total cover: 13		20% of total cover: 5.2	

Woody Vine Stratum (Plot Size: 30')			
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column totals	26	(A)	101 (B)

Prevalence Index = B/A = 3.88

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 15

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-16	10YR 4 / 3	99	7.5YR 5 / 8	1	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- __ Histisol (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 Suface (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[3]:

- __ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric soil present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019

Applicant/Owner: POCCA State: TX Sampling Point: 16

Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 27.84697200 Long: -97.070058 Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 ____ No X	**Is the Sampled Area within a Wetland?**	**Yes ____ No X**
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ____ No X	Depth (inches): ____	
Water table present?	Yes ____ No X	Depth (inches): ____	
Saturation present? (includes capillary fringe)	Yes ____ No X	Depth (inches): ____	**Wetland Hydrology Present? Yes ____ No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 16

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Sapling/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Cynodon dactylon*	90	Y	FACU
2 *Sisyrinchium langloisii*	10	N	UPL
3 *Nothoscordum bivalve*	5	N	FACU
4 *Gaillardia pulchella*	5	N	UPL
5 *Anagallis arvensis*	5	N	FACU
6 *Verbena officinalis*	5	N	FACU
7			
8			
9			
10			
11			
12			
	120	= Total Cover	
50% of total cover: 60		20% of total cover: 24	

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	105	x 4 =	420
UPL species	15	x 5 =	75
Column totals	120	(A)	495 (B)

Prevalence Index = B/A = 4.13

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 16

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc2	Texture	Remarks
0-16	10YR 5 / 4	100	/				Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- __ Histisol (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 Suface (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[3]:

- __ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric soil present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019
Applicant/Owner: POCCA State: TX Sampling Point: 17
Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None
Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 27.84660200 Long: -97.069393 Datum: NAD83
Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of the 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 ___ No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present? Yes ___ No X Depth (inches): ___
Water table present? Yes ___ No X Depth (inches): ___
Saturation present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 17

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Andropogon gerardii*	60	Y	FAC
2 *Dalea purpurea*	30	Y	UPL
3 *Verbena officinalis*	5	N	FACU
4 *Gaillardia pulchella*	5	N	UPL
5			
6			
7			
8			
9			
10			
11			
12			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	5	x 4 =	20
UPL species	35	x 5 =	175
Column totals	100	(A)	375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 17

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-16	10YR 5 / 4	99	7.5YR 5 / 8	1	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

__ Histisol (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 Suface (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[3]:

__ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: N/A
Depth (inches): N/A

Hydric soil present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island City/County: Nuece County Sampling Date: March 19, 2019
Applicant/Owner: POCCA State: TX Sampling Point: 18
Investigator(s): Ashley Bogrand, Orlando Recio Section, Township, Range: None
Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): Concave Slope (%): 10-May
Subregion (LRR or MLRA): LRR T Lat: 27.84667400 Long: -97.06696 Datum: NAD83
Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of the 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 X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes X No ___	Depth (inches): ___
Water table present?	Yes ___ No X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes X No ___	Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 18

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Sapliing/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Panicum repens*	50	Y	FACW
2 *Eleocharis tuberculosa*	30	Y	OBL
3 *Nothoscordum bivalve*	5	N	FACU
4			
5			
6			
7			
8			
9			
10			
11			
12			
	85	= Total Cover	
50% of total cover: 42.5		20% of total cover:	17

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across all Strata:	2	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	100.00%	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column totals	85 (A)		150 (B)

Prevalence Index = B/A = 1.76

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes X No ___

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

SOIL

Sampling Point: 18

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-16	10YR 4 / 1	99	7.5YR 5 / 8	1	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- __ Histisol (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 Suface (A11)
- __ Thick Dark Surface (A12)
- __ Coast Prairie Redox (A16) **(MLRA 150A)**
- __ Sandy Mucky Mineral (S1) **(LRR O, S)**
- __ Sandy Gleyed Matrix (S4)
- X 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[3]:

- __ 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)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric soil present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Harbor Island　City/County: Nuece County　Sampling Date: March 19, 2019

Applicant/Owner: POCCA　State: TX　Sampling Point: 19

Investigator(s): Ashley Bogrand, Orlando Recio　Section, Township, Range: None

Landform (hillslope, terrace, etc.): Prairie　Local relief (concave, convex, none): None　Slope (%): 0

Subregion (LRR or MLRA): LRR T　Lat: 27.84627000　Long: -97.063546　Datum: NAD83

Soil Map Unit Name: Mustang Fine Sand, 0 to 1 percent　NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of the 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 ___	No X	Is the Sampled Area within a Wetland?	Yes ___ No X
Hydric Soil Present?	Yes ___	No X		
Wetland Hydrology Present?	Yes ___	No X		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface water present?	Yes ___	No X	Depth (inches): ___
Water table present?	Yes ___	No X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants

Sampling Point: 19

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Sapliing/Shrub Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
6			
7			
8			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Herb Stratum (Plot Size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1 *Dichanthium aristatum*	95	Y	FACU
2 *Taraxacum officinale*	10	N	FACU
3 *Anagallis arvensis*	5	N	FACU
4 *Oenothera speciosa*	2	N	UPL
5 *Verbena officinalis*	2	N	FACU
6			
7			
8			
9			
10			
11			
12			
	114	= Total Cover	
50% of total cover: 57		20% of total cover:	22.8

Woody Vine Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1 *None*			
2			
3			
4			
5			
	0	= Total Cover	
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	112	x 4 =	448
UPL species	2	x 5 =	10
Column totals	114	(A)	458 (B)

Prevalence Index = B/A = 4.02

Hydrophytic Vegetation Indicators:

___ 1 -Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Yes ___ No X

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

SOIL

Sampling Point: 19

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc2	Texture	Remarks
0-16	10YR 7 / 2	99	10YR 7 / 8	1	C	PL	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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- __ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- __ Muck Presence (A8) **(LRR U)**
- __ 1 cm Muck (A9) **(LRR P, T)**
- __ Depleted Below Dark Suface (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)**
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- __ 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)**

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- __ 1 cm Muck (A9) **(LRR O)**
- __ 2 cm Muck (A10) **(LRR S)**
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- __ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric soil present? Yes ____ No X

Remarks:

APPENDIX C

List of Plant Species

List of Plant Species

Motiva Savannah Site

Common Name	Scientific Name	Indicator Status
Bermuda Grass	*Cynodon dactylon*	FACU
Black-Edge Sedge	*Carex nigromarginata*	FACU
Robin's-Plantain	*Erigeron pulchellus*	FACU
Racemed Milkwort	*Polygala polygama*	FACU
Garden Vetch	*Vicia sativa*	FACU
Pink Evening Rose	*Oenothera speciosa*	UPL
Firewheel	*Gaillardia pulchella*	UPL
Crowpoison	*Nothoscordum bivalve*	FACU
Scarlet Pimpernel	*Anagallis arvensis*	UPL
Common Dandelion	*Taraxacum officinale*	FACU
Berlandier's Yellow Flax	*Linum berlandieri*	UPL
Giant-Reed	*Arundo donax*	FAC
Angular-Fruit Anglepod	*Gonolobus suberosus*	FACW
Angleton's Bluestem	*Dichanthium aristatum*	FACU
Roadside Blue-Eyed Grass	*Sisyrinchium langloisii*	UPL
Big Bluestem	*Andropogon gerardii*	FAC
Bushy Bluestem	*Andropogon glomeratus*	FACW
Chairmaker's Club-Rush	*Schoenoplectus americanus*	OBL
Tiny Blulet	*Houstonia pusilla*	FACU
Goldenmane Tickseed	*Coreopsis basalis*	UPL
Showy Evening Primrose	*Oenothera grandis*	UPL
Virginia pepperweed	*Lepidium virginicum*	UPL
Spiny-Leaf Sow-Thistle	*Sonchus asper*	UPL
Purple Prairie Clover	*Dalea purpurea*	UPL
Bristleleaf Pricklyleaf	*Thymophylla tenuiloba*	UPL
Torpedo Grass	*Panicum repens*	FACW

APPENDIX D

Resumes of Field Personnel

Ashley Bogrand, M.S.
Biologist

wood.

Summary

Years of Experience

6

West US- Houston

17325 Park Row

Houston, TX 77084

Industries

- Oil and Gas
- Midstream

Areas of Expertise

- Biological Resources
- Wildlife Inventories
- Avian Biology
- Vegetation Assessment
- Invasive Species Removal
- NEPA documentation
- Wetland Delineation
- Environmental Site Assessment
- ArcGIS

Areas of Expertise

- Wetland Delineation - 2019

Professional Summary

Ms. Bogrand is an experienced biologist with six years in the environmental and wildlife consulting field. Ms. Bogrand's experience includes biological resource inventories with emphasis on avian and wildlife biology, vegetation assessments, wetland delineations, Phase I Environmental Site Assessments (ESA), National Environmental Policy Act (NEPA) documentation, and experience with ArcGIS map creation and data management.

Qualifications

Education

Bachelor of Science, Wildlife Biology, West Texas A&M University, 2009

Masters of Science, Biology, Sam Houston State University, 2013

Registrations / Certifications / Licenses

40 Hour HAZWOPER

Publications / Presentations

- Bogrand, A.L., D.L.H. Neudorf, P. Matich. 2017. Predator recognition and nest defence by Carolina Wrens *Thryothorus ludovicianus* in urban and rural environments: does experience matter? Bird Study. 64: 211-221.

Software / Skills

- ArcGIS

Current Projects

- Motiva Berth Expansion
- Corpus Christi Harbor Island Development
- INEOS Wastewater Pipe Installation

Experience

Biologist

Phillips 66, Gray Oak Pipeline, Texas

Ms. Bogrand assisted on field surveys and permitting support services to Phillips 66 on the 845-mile-long Gray Oak Pipeline Project, proposed to transport crude oil from the Permian Basin to the Corpus Christi area. Ms. Bogrand conducted field surveys for the evaluation and identification of waters of the United States (WOUS), including wetlands and streams and threatened and endangered species surveys along the proposed pipeline routes.

Ashley Bogrand, M.S.
Biologist

wood.

Experience

Motiva Enterprises LLC, Port Arthur Berth, Port Arthur, TX

- Motiva submitted pre-application packages to USACE Galveston to begin the process for the creation of a new liquid berth at the Motiva Refinery and Terminal in Port Arthur, TX. Ms. Bogrand assisted permitting specialists in designing responses to comments submitted by USACE and coordinating figure creation with the GIS sector.

Port of Corpus Christi Authority (POCCA), Harbor Island, Texas

- POCCA required sediment sampling (testing for aquatic vegetation, grain size, total organic carbons, and benthic invertebrates), water quality and velocity measurements, presence/absence of oyster reefs, and marine life netting and identification for the development of Harbor Island. Ms. Bogrand participated in composing work plans and health and safety plans. Ms. Bogrand also conducted surveys and testing for all necessary field sampling. This included using a Petite Ponar to collect benthic invertebrate and sediment samples, a Valeport 106 Water Velocity Meter to measure water velocity, and a flow meter to measure water quality. Future work will be participating in the composure of an EA.

Environmental Scientist

TPC Group, LLC, Houston Operations, Houston, TX

- Ms. Bogrand assisted in the renewal process of the Texas Commission on Environmental Quality (TCEQ) industrial wastewater discharge permit for TPC Group's Houston based facility. Activities included analyzing sampling data, FEMA records, outflow systems, and composure of TCEQ Form 10055.

Enbridge, Hockley Phase I Environmental Site Assessment (ESA), Hockley, TX

- Ms. Bogrand conducted the Phase I ESA for three residential locations located in Hockley, TX. Activities included field reconnaissance, review of state, county, and local records, and preparation of the Phase I ESA report.

Enbridge, Jefferson County Right of Way Phase I ESA, Beaumont, TX

- Ms. Bogrand conducted the Phase I ESA for an oil and gas pipeline right of way property. Activities included field reconnaissance, review of state, county, and local records, and preparation of the Phase I ESA report.

Lyondell, Waste Inventory Tracking Program Development, Channelview, TX

- Ms. Bogrand organized all current and expired waste streams at two LyondellBasell locations into a functioning, interactive database for the support of the waste management personnel. This database included organizing waste into categories, and providing notifications when updates were needed to the waste profile.

Site Supervisor

General Electric, Rose Equipment and Facility Decommissioning and Cleaning, Tyler, TX

- Ms. Bogrand acted as site supervisor for the decommissioning and cleaning of a GE Plant in Tyler, TX. The role of site supervisor included monitoring for OSHA compliance and demonstrating successful completion of the project.

INEOS Styrolution, Construction of a Waste Water Pipe, Texas City, TX

- Ms. Bogrand acted as construction supervisor and environmental monitor for installation of a wastewater pipeline located in Texas City. This role involved managing safety for all sub-contractors, meeting with the client, composing daily reports, and monitoring environmental issues such as spill cleanups, SWPPP compliance, and general oversight.

Pre-Wood Employment

Gulf South Research Corporation

- Ms. Bogrand managed and conducted field surveys for biological resources with an emphasis on avian and wildlife biology, contributing to the preparation of technical reports, data collection and analysis, and support on ecological restoration and invasive species removal projects. Specific projects include cowbird trapping, construction monitoring, breeding burrowing owl surveys, neo-tropical avian surveys, general wildlife inventory surveys in the Mojave Desert, wildlife hazard assessments and surveys for the Interior Least Tern on the Red River.

Western Eco-systems Technology

- Ms. Bogrand conducted aerial surveys of the Lesser and Greater Prairie Chickens. This included recording data and identifying between the two types of Prairie Chickens. She also managed and conducted post construction monitoring on wind farms. This involved using plot surveys following transect protocol to monitor bird and bat fatalities and using proper identification methods to identify bird and bat species.

The City of Amarillo

- Ms. Bogrand maintained and updated the water and waste water GIS database with record drawing information from project representatives. She operated computer workstation to update maps as new data is received relative to subdivisions, developments, capital improvement projects, and other projects. Ms. Bogrand prepared water and waste water drawings using GIS software. Assisted in the organization and filing of drawings, plans and other documents related to the maintenance and upkeep of record drawing information. This also included, producing printed water and waste water maps for both the Utilities office and the general public showing map features, platted lots, and distances.

Eco-logical Environmental Services

- Ms. Bogrand managed projects from initial client consultation through project completion. Conducted Phase I site assessments and reports and generated storm water discharge permitting and compliance. She generated technical and well-composed reports to clients and government regulatory agencies and provided communication to field personnel, vendors, and different government agencies to complete projects on time. This work also included conducting assessment and remediation processes and procedures on a variety of chemical spills and disposing of hazardous and non-hazardous waste from various industries.

Professional History

- Wood (2018 – Present)
- Gulf South Research Corporation (2016-2018)
- Western Ecosystem Technology (2015-2016)
- The City of Amarillo, Texas (2013-2015)
- Eco-logical Environmental Services (2013)

Orlando_Recio@yahoo.com
3301 Olsen Dr.
Corpus Christi, TX 78411
361.779.3057

Orlando Recio
Civil Engineer, EIT

Years of experience
9

Registrations/Certifications
Engineer In Training, Texas

Professional affiliations
American Society of Civil Engineers
Water Environment Association of Texas
(WEAT)

Education
B.S., 2008, Civil Engieering, Texas A&M University-Kingsville, Kingsville, TX

Mr. Recio is currently an Engineer in WOOD's Corpus Christi, Texas office. Over the years Mr. Recio has gained experience, Subsurface Utility Engineering (SUE), utility design, construction, operations, and inspection of civil type projects (roads, highways, levees, pipelines). Projects have included design build projects, roadways, highways, drainage studies, environmental testing and analysis, and flood mitigation measures using GIS mapping techniques. Additionally, Mr. Recio also has extensive experience in Environmental assessment and site remediation for Industrial clients. In addition to project experience he has also served as a Site Health and Safety Representative whom was responsible for reviewing safety plans, addressing local safety issues and passing on important information to colleagues. As a Project Engineer, Mr. Recio understands the need for creating a friendly and reliable workplace culture conducive for project success and that the safety of the general public and fellow coworkers is paramount.

Selected project experience

Site Remediation, Industrial Client, Corpus Christi, TX.

Mr. Recio is responsible for the operation of on-site extraction and treatment of groundwater with a significant historical hydrocarbon release. He also assists in several field work activities such as sampling, construction oversight and general maintenance activities for the onsite Ground Water Recovery Unit. In addition to that Mr. Recio evaluates the effectiveness of the recovery network of wells and routinely updates the client. **Date:(October 2018-Current).**

Water Waste and Remediation Services, Industrial Client, Corpus Christi, TX

Mr. Recio was the Project Manager for a 5 year contract to provide Operation and Maintenance Services on a remediation site as well as provide regulatory and environmental consultation services to the client. Mr. Recio was the direct contact to the client and manages new tasks by developing budgets and pulling in company resources as needed. Mr. Recio also coordinated semi-annual sampling and reporting requirements to the TCEQ for two project locations. **Date: February 2017–September2018**

Harbor Bridge Design Build Utility Coordinator, Flatiron/Dragados LC. Corpus Christi, TX

Mr. Recio was the lead utility coordinator for a TxDOT project building a new bridge in Corpus Christi, TX. He was responsible for coordinating with Utility Stakeholders and project designers to adjust utilities in the way of construction. These efforts included conducting a SUE investigation, cataloging all utilities and assisting all utility stakeholders through a unique permit process. He managed a small team to ensure all stakeholders are being assisted promptly and all deliverables are being met promptly. **Date: (January 2016 – February 2017)**

Benzene Waste Operations Neshaps (BWON) Sampling Initiative, Industrial Client, Corpus Christi, TX.

Mr. Recio has worked with the client to develop a procedure for sampling over 800 high risk waste streams. Mr. Recio also was involved in hiring and training team for conducting field work. He is responsible for developing sampling schedule, analyzing results and providing continual updates to the client. Mr. Recio also will respond and coordinate any additional tasks that the client request. **Date: (December 2014 – December 2015)**.

Soil Vapor Extraction, Industrial Client, Corpus Christi, TX.

Mr. Recio has ran a "first of its kind" SVE unit and has been vital in its optimization. He routinely samples and monitors various points and ships out hazardous classified samples via FEDEX. Also, as new wells are installed he has coordinated with utility locators and drilling companies to ensure all the work is done safely and without incident. **Date: (2012-2015).**

Site Remediation, Industrial Client, Corpus Christi, TX.

Mr. Recio has designed an access road for a system responsible for the operation of on-site extraction and treatment of groundwater with a significant historical hydrocarbon release. He has also assisted in several field work activities such as sampling and semi-annual gauging events and construction oversight for a new Ground Water Recovery Unit. In addition to that Mr. Recio has performed several pump tests in order to maximize effectiveness of their recovery network of wells. **Date:(2008-2015).**

Phase I Environmental Site Assessment (ESA), Texas General Land Office, Rockport, TX.

Mr. Recio conducted environmental site assessments of several tracts of land and interviewed land owners, investigating any historic impacts. A detailed report was then put together by Mr. Recio and submitted to the Texas GLO. **Date: (2012 -2015)**

Ballard Sand Pits Monitoring, TCEQ, Robstown, TX.

Mr. Recio has air monitored the remediation site for high concentrations of benzene in the air and was responsible for alerting personnel when any high concentrations were present. This was so that immediate actions can be taken and the surrounding community and construction workers would remain safe. This area was used as a dumping site for several contaminants, most notably benzene. During this project he worked closely with the TCEQ as this was a Super Fund Site. **Date:(Sept –July 2009)**

Appendix H

Consistency with the Texas Coastal Management Program Document

CONSISTENCY WITH THE TEXAS COASTAL MANAGEMENT PROGRAM

THE APPLICANT SHOULD SIGN THIS STATEMENT AND RETURN WITH APPLICATION PACKET TO:

COASTAL PERMIT SERVICE CENTER
6300 OCEAN DRIVE, TAMU-CC
CORPUS CHRISTI, TX 78412-5841
FAX: (361) 825-3465

FOR USACE USE ONLY:

PERMIT #:________________

PROJECT MGR:________________

APPLICANT'S NAME AND ADDRESS (PLEASE PRINT):

Title: Ms. First: Sarah Last: Garza Suffix:

Mailing Address: 222 Power Street

Home:

Work: +1 (361) 885-6116

City: Corpus Christi State: Texas Zip Code: 78401 Mobile:

Country: USA Email: sarah@pocca.com Fax: +1 (361) 882-5163

The Texas Coastal Management Program (CMP) coordinates state, local, and federal programs for the management of Texas coastal resources. Activities within the CMP boundary must comply with the enforceable policies of the Texas Coastal Management Program and be conducted in a manner consistent with those policies. The boundary definition is contained in the CMP rules (31 TAC §503.1).

- To determine whether your proposed activity lies within the CMP boundary, please contact the Permit Service Center at permitting.assistance@glo.texas.gov

PROJECT DESCRIPTION:

Is the proposed activity at a waterfront site or within coastal, tidal, or navigable waters? ☒ Yes ☐ No

If Yes, name affected coastal, tidal, or navigable waters: Aransa Pass, Port of Corpus Christi Ship Channel, and Lydia

Is the proposed activity water dependent? ☒ Yes ☐ No (31 TAC §501.3(a)(14))

http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=16&ch=501&rl=3

Please briefly describe the project and all possible effects on coastal resources:

The Port of Corpus Christi Authority of Nueces County (PCCA) proposes the construction of two marine berths requiring dredging and excavation along the southern portion of Harbor Island, Corpus Christi, Texas adjacent to the Corpus Christi Ship Channel. The new berths will be dredged to a depth of 60 feet mean lower low water (MLLW) (-54 feet MLLW plus four feet of advance maintenance and two feet of allowable over dredge). Dredge material will be transfered to dredge placement area(s). The project area covers approximately 64.8 acres of terminal basin.

Indicate area of impact: 64.8 ☒ acres or ☐ square feet

ADDITIONAL PERMITS/ AUTHORIZATIONS REQUIRED:

☐ Coastal Easement - Date application submitted:

☐ Coastal Lease - Date application submitted:

☐ Stormwater Permit- Date application submitted:

☒ Water Quality Certification - Date application submitted: In Progress

☐ Other state/federal/local permits/authorizations required:

The proposed activity must not adversely affect coastal natural resource areas (CNRAs).

PLEASE CHECK ALL COASTAL NATURAL RESOURCE AREAS THAT MAY BE AFFECTED:

☐ Coastal Barriers
☐ Coastal Historic Areas
☐ Coastal Preserves
☒ Coastal Shore Areas
☐ Coastal Wetlands
☐ Critical Dune Areas
☐ Critical Erosion Areas
☐ Gulf Beaches
☐ Hard Substrate Reefs
☐ Oyster Reefs
☐ Special Hazard Areas
☒ Submerged Lands
☐ Submerged Aquatic Vegetation
☐ Tidal Sand or Mud Flats
☐ Waters of Gulf of Mexico
☒ Waters Under Tidal Influence

The applicant affirms that the proposed activity, its associated facilities, and their probable effects comply with the relevant enforceable policies of the CMP, and that the proposed activity will be conducted in a manner consistent with such policies.

PLEASE CHECK ALL APPLICABLE ENFORCEABLE POLICIES:

http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=31&pt=16&ch=501&sch=B&rl=Y

X	§501.15 Policy for Major Actions
	§501.16 Policies for Construction of Electric Generating and Transmission Facilities
	§501.17 Policies for Construction, Operation, and Maintenance of Oil and Gas Exploration and Production Facilities
	§501.18 Policies for Discharges of Wastewater and Disposal of Waste from Oil and Gas Exploration and Production Activities
	§501.19 Policies for Construction and Operation of Solid Waste Treatment, Storage, and Disposal Facilities
	§501.20 Policies for Prevention, Response and Remediation of Oil Spills
	§501.21 Policies for Discharge of Municipal and Industrial Wastewater to Coastal Waters
	§501.22 Policies for Nonpoint Source (NPS) Water Pollution
	§501.23 Policies for Development in Critical Areas
X	§501.24 Policies for Construction of Waterfront Facilities and Other Structures on Submerged Lands
X	§501.25 Policies for Dredging and Dredged Material Disposal and Placement
	§501.26 Policies for Construction in the DBeach/Dune System
	§501.27 Policies for Development in Coastal Hazard Areas
	§501.28 Policies for Develpment Within Coastal Barrier Reource System Units and Otherwise Protected Areas on Coastal Barriers
	§501.29 Policies for Development in State Parks, Wildlife Management Areas or Preserves
	§501.30 Policies for Alteration of Coastal Historic Areas
	§501.31 Policies for Transportation Projects
	§501.32 Policies for Emission of Air Pollutants
	§501.33 Policies for Appropriations of Water
	§501.34 Policies for Levee and Flood Control Projects

Please explain how the proposed project is consistent with the applicable enforceable policies identified above. Please use additional sheets if necessary. *For example: If you are constructing a pier with a covered boathouse, then the applicable enforceable policy is:§501.24 Policies for Construction of Waterfront Facilities and Other Structures on Submerged Lands. The project is consistent because it will not interfere with navigation or natural coastal processes, and it avoids/minimizes shading.*

§501.15 Policy for Major Actions: This project will adhere to Federal and State regulations and requirements for work in coastal waters. Consultations and coordination efforts will be a key component to ensuring that all activities meet the requirements of all agencies that may have jurisdiction over this project. All impacts to coastal natural resource area will be minimized to the fullest extent possible and no entity involved in construction will pursue an action that is counter to the goals and polices set forth in Texas Administrative Codes.

§501.24 Policies for Construction of Waterfront Facilities and Other Structures on Submerged Lands: The three proposed berths have been designed and will be constructed in such a manner that they will not interfere with public or commercial navigation or will impact coastal resources. The project is being developed and will be constructed in such a manner that procedures to prevent the release of pollutants into the Waters of the State will be developed and adhered to.

§501.25 Policies for Dredging and Dredged Material and Placement: The project is consistent with this subchapter because it has been designed to minimize adverse effects to coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches to the greatest extent practicable. Adverse effects will be minimized by employing BMP techniques and those presented in subsections

§501.25(b)(1-8). Cumulative and secondary adverse effects of dredging and the disposal and placement of dredged material and the unique characteristics of affected sites were taken into consideration. Dredging and dredged material disposal and placement will not cause or contribute, after consideration of dilution and dispersion, to violation of any applicable surface water quality standards· and shall comply with applicable standards for sediment toxicity. The dredge material will not be disposed of or placed directly on the boundaries of submerged lands or at such location so as to slump or migrate across the boundaries of submerged lands.

BY SIGNING THIS STATEMENT, THE APPLICANT IS STATING THAT THE PROPOSED ACTIVITY COMPLIES WITH THE TEXAS COASTAL MANAGEMENT PROGRAM AND WILL BE CONDUCTED IN A MANNER CONSISTENT WITH SUCH PROGRAM

Signature of Applicant/Agent

7/10/19

Date

Any questions regarding the Texas Coastal Management Program should be referred to:

Jesse Solis
Texas General Land Office
6300 Ocean Drive
TAMU-CC Natural Resource Center Ste. 2800
Corpus Christi, Texas 78412-5599
Phone: (361) 825-3050
Fax: (361) 825-3465
Toll Free: 1-866-894-3578
permitting.assistance@glo.texas.gov

Ray Newby
Texas General Land Office
Coastal Resources Division
1700 North Congress Avenue, Room 330
Austin, Texas 78701-1495
Phone: (512) 475-3624
Fax: (512) 475-0680
Toll Free: 1-800-998-4GLO
ray.newby@glo.texas.gov

Print Form

Appendix I

Texas Commission on Environmental Quality Tier II 401 Certification Questionnaire and Alternatives Analysis Checklist

Tier II 401 Certification Questionnaire and Alternatives Analysis Checklist

Does your project meet Texas' water quality standards?

The Texas Commission on Environmental Quality (TCEQ) must consider this question for all proposed projects seeking a Section 404 dredge and fill permit.

****

One of the requirements for obtaining a Corps of Engineers Section 404 permit is certification from the TCEQ that the permit will comply with State water quality standards. This requirement is authorized by Section 401 of the Federal Clean Water Act, and is therefore referred to as 401 certification.

The attached 401 certification questionnaire must be submitted in order for the TCEQ to determine whether or not a project should be granted 401 certification. Please note that the information requested in this questionnaire is not required in order for a Section 404 application to be considered administratively complete by the Corps of Engineers. However, failure to provide this information (including the Alternatives Analysis Checklist) to the TCEQ (within 30 days of the public notice) may cause your project to be denied 401 certification without prejudice.

What do you need to submit to TCEQ?

1. A completed 401 certification questionnaire.

   A completed 401 certification questionnaire is attached.

2. A completed Alternatives Analysis Checklist (if your project affects surface water in the State, including wetlands)

   A completed Alternatives Analysis Checklist is attached.

3. A map with the location of the project clearly marked (A U.S. Geological Survey (USGS) topographic map strongly recommended)

   A USGS topographic map clearly marked with the dredge project location and dredge material placement area is attached.

4. Photographs or a video cassette showing the project area and any associated disposal areas (Map and photos should be numbered to show where the photos were taken, and the area covered by each photo)

   Photographs of the dredge location and dredge material placement area are not available. Refer to Appendix C of the combined Section 10 and Section 404 Permit Application for aerial images of the project area.

What is involved in review of Section 401 certifications?

1. Filing an application with the Corps starts both the 404 permit and the 401 certification processes

2. A Joint Public Notice is issued by the Corps and the TCEQ after receipt by the Corps of a completed application to inform the public and other government agencies of the proposed activity

   - A 30 day comment period follows
   - The TCEQ may hold a public hearing to consider the potential adverse impacts of the

proposed project on water quality

2. The TCEQ may request additional information from the application, persons submitting comments or requesting a hearing, or other resource agencies

3. A final 401 certification decision will be provided following the end of the comment period.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Tier II
401 Certification Questionnaire

The following questions seek to determine how adverse impacts will be avoided during construction or upon completion of the project. If any of the following questions are not applicable to your project, write NA ("not applicable") and continue.

Please include the applicant's name as it appears on the Corps of Engineers' permit application (and permit number, if known) on all material submitted.

Applicant:
Sarah L. Garza
Port of Corpus Christi of Nueces County (PCCA)
222 Power Street
Corpus Christi, Texas 78401

The material should be sent to:

Texas Commission on Environmental Quality
Attn: 401 Coordinator (MC-150)
P.O. Box 13087
Austin, TX 78711-3087

I. Impacts to surface water in the State, including wetlands

A. What is the area of surface water in the State, including wetlands, that will be disturbed, altered or destroyed by the proposed activity?

PCCA is proposing the construction of two berths requiring dredging and excavation along the southern portion of Harbor Island. The two berths will be inset into Harbor Island at approximate a 45-degree angle. The two berths will be in an area currently occupied by three damaged and unusable berths, which are in the process of being demolished. The new berths will be dredged to a depth of -54 ft mean lower low water (MLLW) to match the current authorized channel. The project area covers approximately 64.8 acres of Terminal Basin.

B. Is compensatory mitigation proposed? If yes, submit a copy of the mitigation plan. If no, explain why not.

Compensatory mitigation is not proposed as there will be no net loss of estuarine habitat because of dredging.

C. Please complete the attached Alternatives Analysis Checklist.

The Alternatives Analysis Checklist is attached below.

II. Disposal of waste materials

A. Describe the methods for disposing of materials recovered from the removal or destruction of existing structures.

Debris and other unsuitable materials may be encountered during dredging and construction. Minimal disposal will be required. All material that is not re-useable will be disposed of at a properly permitted facility.

B. Describe the methods for disposing of sewage generated during construction. If the proposed work establishes a business or a subdivision, describe the method for disposing of sewage after completing the project.

Sewage generated during dredging and dredge material placement activities will be collected on ship-board waste facilities or through use of portable toilets placed on land.

C. For marinas, describe plans for collecting and disposing of sewage from marine sanitation devices. Also, discuss provisions for the disposing of sewage generated from day-to-day activities.

NA

III. Water quality impacts

A. Describe the methods to minimize the short-term and long-term turbidity and suspended solids in the waters being dredged and/or filled. Also, describe the type of sediment (sand, clay, etc.) that will be dredged or used for fill.

No long-term turbidity or suspended solids are anticipated from this project as currents and tidal action will minimize and shorten any sediment suspension. PCCA proposes to incorporate the following conservation measures to minimize the short-term turbidity effects of the project:

- *All work will occur during an approved in-water work window;*
- *Vessel operators will follow designated speed zones to and from the project site;*
- *Dredge passes will likely start near the shoreline, moving toward deeper water;*
- *During transport and handling of sediment, containment measures will be used to minimize spillage;*
- *PCCA will require the contractor to use a GPS to ensure that material is removed from the correct location;*
- *The contractor will use an appropriate dredging technique for the project such as hydraulic dredging, mechanical dredging, or suction dredging.*
- *The contractor will be allowed to excavate beyond the maximum depth (54 feet below MLLW plus four feet of advanced maintenance and two feet of allowable over dredge);*
- *No bottom stockpiling or multiple bites of the clamshell bucket will be allowed;*
- *Over-dredging at the base of a slope will not occur;*
- *Although not anticipated to be necessary, surface booms, oil-absorbent pads, and similar materials will be on-site to contain any sheen that may occur on the surface of the water during dredging; and*
- *Deployment of a full depth turbidity curtain to minimize turbidity, if necessary.*

The dredge location sediment is predominantly composed of sand.

B. Describe measures that will be used to stabilize disturbed soil areas, including: dredge material mounds, new levees or berms, building sites, and construction work areas. The description should address both short-term (construction related) and long-term (normal operation or maintenance) measures. Typical measures might include containment structures, drainage modifications, sediment fences, or vegetative cover. Special construction techniques intended to minimize soil or sediment disruption should also be described.

Dredge material will be placed in an authorized dredge material placement area(s). If needed the material would be hydraulically pumped to raise the containment dike at the proposed existing placement area, after which it would be used to fill the interior. After dike construction is required, rip-rap, rock, etc. would be added where armoring is needed, and dike side slopes would be seeded and vegetated as soon as practicable with robust and rapidly establishing species to provide long term stability.

C. Discuss how hydraulically dredged materials will be handled to ensure maximum settling of solids before discharging the decant water. Plans should include a calculation of minimum settling times with supporting data (Reference: Technical Report, DS-7810, Dredge Material Research Program, GUIDELINES FOR DESIGNING, OPERATING, AND MAINTAINING DREDGED MATERIAL CONTAINMENT AREAS). If future maintenance dredging will be required, the disposal site should be designed to accommodate additional dredged materials. If not, please include plans for periodically removing the dried sediments from the disposal area.

Technical Report DS-7810 will be consulted, along with newer Unites States Army Corps of Engineers (USACE) guidance, to determine exactly how hydraulically dredged materials will be handled to ensure maximum settling of solids before discharging the decant water.

At the material placement area, interior training dikes, ditching, and other enhanced dewatering techniques would be employed as necessary to further optimize material retention and dewatering.

D. Describe any methods used to test the sediments for contamination, especially when dredging in an area known or likely to be contaminated, such as downstream of municipal or industrial wastewater discharges.

The material proposed to be dredged will be sampled in accordance with a sampling analysis plan (SAP). The results of the sampling effort will be presented in a document which will discuss the sediment chemistry to support the determination of the material suitability for placement onsite and/or within one or more of the designated existing upland confined DMPA's.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Tier II
Alternatives Analysis Checklist

I. Alternatives

A. How could you satisfy your needs in ways which do not affect surface water in the State?

This project is water dependent and designed to meet the needs of the demand for the safety and efficiency of vessel movement to Harbor Island. Therefore, there are no alternatives which do not satisfy project objectives without affecting surface waters of the State of Texas. Activities may affect water quality within the proposed project area by temporarily increasing turbidity and suspended sediments load in the estuarine water column. However, these temporary conditions would not be expected to adversely impact marine mammals, essential fish habitat, or other aquatic resources in the project location to a significant degree.

B. How could the project be re-designed to fit the site without affecting surface water in the State?

This project is water dependent. Creating new berths cannot be accomplished without affecting surface waters of the State of Texas.

C. How could the project be made smaller and still meet your needs?

The number of new berths has been reduced from three to two noting the extreme quantity of dredge material that three berths would have generated.

D. What other sites were considered?

No other dredge sites were considered. The proposed maneuvering basin is incorporated in an area where two new shipping berths are being proposed to be built as part of a modernized new crude oil shipping terminal. Of most critical importance is that the Harbor Island location is in an optimal position to be able to accept deep-draft ocean-going ships sized to carry petroleum. The proposed material placement area(s) are already active placement sites; therefore, no other alternative sites were considered.

1. What geographical area was searched for alternative sites? *NA*
2. How did you determine whether other non-wetland sites are available for development in the area? *NA*
3. In recent years, have you sold or leased any lands located within the vicinity of the project? If so, why were they unsuitable for the project? *NA*

E. What are the consequences of not building the project?

The purpose of the proposed project is to provide the necessary dock and berthing facilities to support vessel engagement with the loading, unloading, transportation, importing, and exporting of petroleum and other bulk products via waterborne commerce. Construction of the proposed project would provide the facilities necessary to integrate existing barge, pipeline, and storage infrastructure to maximize product handling efficiencies. The No Action alternative would not satisfy PCCAs mission of leveraging commerce to drive prosperity for the region and local communities or the national mission to reduce the trade deficit.

II. Comparison of alternatives

A. How do the costs compare for the alternatives considered above?

No costs have been estimated at this point. There would be no costs involved with the No Action alternative.

B. Are there logistical (location, access, transportation, etc.) reasons that limit the alternatives considered?

No.

C. Are there technological limitations for the alternatives considered?

No.

D. Are there other reasons certain alternatives are not feasible?

No.

III. If you have not chosen an alternative which would avoid impacts to surface water in the State, please explain:

A. Why your alternative was selected, and

This proposed action (dredging to a depth of 54 feet below MLLW) was chosen because it is designed to meet the needs of the demand for the safety and efficiency of the growing crude oil export industry while still being financially feasible for PCCA on a channel already authorized to be dredged to 54 feet below MLLW.

B. What you plan to do to minimize adverse effects on the surface water in the State impacted.

Although project activities may affect water quality within the proposed project area by *temporarily increasing turbidity and suspended sediments load in the estuarine water column, these temporary conditions would not be expected to adversely impact marine mammals, essential fish habitat, or other aquatic resources in the project location to a significant degree. However, PCCA proposes to incorporate the following conservation measures to minimize the short-term turbidity effects of the project:*

- *All work will occur during an approved in-water work window;*
- *Vessel operators will follow designated speed zones to and from the project site;*
- *Dredge passes will likely start near the shoreline, moving toward deeper water;*
- *During transport and handling of sediment, containment measures will be used to minimize spillage;*
- *PCCA will require the contractor to use a GPS to ensure that material is removed from the correct location;*
- *The contractor will use an appropriate dredging technique for the project such as hydraulic dredging, mechanical dredging, or suction dredging.*
- *The contractor will not be allowed to excavate beyond the maximum depth (54 feet below MLLW plus four feet of advanced maintenance and two feet of allowable over dredge);*
- *No bottom stockpiling or multiple bites of the clamshell bucket will be allowed;*
- *Over-dredging at the base of a slope will not occur;*
- *Although not anticipated to be necessary, surface booms, oil-absorbent pads, and similar materials will be on-site to contain any sheen that may occur on the surface of the water during dredging; and*
- *Deployment of a full depth turbidity curtain to minimize turbidity, if necessary.*

IV. Please provide a comparison of each criteria (from Part II) for each site evaluation in the alternatives analysis.

Please see Appendix B of the combined Section 10 and Section 404 Permit Application for more details.

Appendix J

Protected Natural Resources Information

EFH Data Notice: Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional Fishery Management Councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Southeast Regional Office
Atlantic Highly Migratory Species Management Division

Query Results

Degrees, Minutes, Seconds: Latitude = 27º50'55" N, Longitude = 98º56'28" W
Decimal Degrees: Latitude = 27.85, Longitude = -97.06

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

EFH

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Red Drum	ALL	Gulf of Mexico	Red Drum Fishery
			Reef Fish (43 Species) **Balistidae - Triggerfishes** Gray triggerfish (*Balistes capriscus*) **Carangidae - Jacks** Greater amberjack (*Seriola dumerili*) Lesser amberjack (*Seriola fasciata*) Almaco jack (*Seriola rivoliana*) Banded rudderfish (*Seriola zonata*) **Labridae - Wrasses** Hogfish (*Lachnolaimus maximus*) **Lutjanidae - Snappers** Queen snapper (*Etelis	ALL	Gulf of Mexico	Reef Fish Fishery

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			oculatus) Mutton snapper (*Lutjanus analis*) Schoolmaster (*Lutjanus apodus*) Blackfin snapper (*Lutjanus buccanella*) Red snapper (*Lutjanus campechanus*) Cubera snapper (*Lutjanus cyanopterus*) Gray (mangrove) snapper (*Lutjanus griseus*) Dog snapper (*Lutjanus jocu*) Mahogany snapper (*Lutjanus mahogoni*) Lane snapper (*Lutjanus synagris*) Silk snapper (*Lutjanus vivanus*) Yellowtail snapper (*Ocyurus chrysurus*) Wenchman (*Pristipomoides aquilonaris*) Vermilion snapper (*Rhomboplites aurorubens*) **Malacanthidae - Tilefishes** Goldface tilefish (*Caulolatilus chrysops*) Blackline tilefish (*Caulolatilus cyanops*) Anchor tilefish (*Caulolatilus intermedius*) Blueline tilefish (*Caulolatilus microps*) (Golden) Tilefish			

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			(*Lopholatilus chamaeleonticeps*) **Serranidae - Groupers** Dwarf sand perch (*Diplectrum bivittatum*) Sand perch (*Diplectrum formosum*) Rock hind (*Epinephelus adscensionis*) Speckled hind (*Epinephelus drummondhayi*) Yellowedge grouper (*Epinephelus flavolimbatus*) Red hind (*Epinephelus guttatus*) Goliath grouper (*Epinephelus itajara*) Red grouper (*Epinephelus morio*) Misty grouper (*Epinephelus mystacinus*) Warsaw grouper (*Epinephelus nigritus*) Snowy grouper (*Epinephelus niveatus*) Nassau grouper (*Epinephelus striatus*) Marbled grouper (*Epinephelus inermis*) Black grouper (*Mycteroperca bonaci*) Yellowmouth grouper (*Mycteroperca interstitialis*) Gag (*Mycteroperca microlepis*) Scamp (*Mycteroperca			

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			phenax) Yellowfin grouper (*Mycteroperca venenosa*)			
			Coastal Migratory Pelagics	ALL	Gulf of Mexico	Coastal Migratory Pelagic Resources (Mackerels)
			Shrimp (4 Species) Brown shrimp (*Penaeus aztecus*) White shrimp (*Penaeus setiferus*) Pink shrimp (*Penaeus duorarum*) Royal red shrimp (*Pleoticus robustus*)	ALL	Gulf of Mexico	Shrimp Fishery
			Bull Shark	Juvenile/Adult Neonate ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Spinner Shark	Neonate ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Lemon Shark	Juvenile Neonate ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Sailfish	Adult Juvenile ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Scalloped Hammerhead Shark	Neonate ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Blacktip Shark (Gulf of Mexico Stock)	Neonate ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Atlantic Sharpnose Shark (Gulf of Mexico Stock)	Juvenile/Adult Neonate ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Bonnethead Shark (Gulf of Mexico Stock)	Adult Juvenile Neonate ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Finetooth Shark	ALL	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
Gulf of Mexico Dolphin Wahoo EFH, Dolphin

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Aransas and Nueces counties, Texas

Local office

Texas Coastal Ecological Services Field Office

(281) 286-8282
(281) 488-5882

17629 El Camino Real #211
Houston, TX 77058

http://www.fws.gov/southwest/es/TexasCoastal/
http://www.fws.gov/southwest/es/ES_Lists_Main2.html

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Gulf Coast Jaguarundi Herpailurus (=Felis) yagouaroundi cacomitli No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3945	Endangered
Ocelot Leopardus (=Felis) pardalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4474	Endangered
West Indian Manatee Trichechus manatus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4469	Threatened Marine mammal

Birds

NAME	STATUS
Attwater's Greater Prairie-chicken Tympanuchus cupido attwateri No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7259	Endangered

Least Tern *Sterna antillarum* — Endangered

This species only needs to be considered if the following condition applies:

- Wind Related Projects Within Migratory Route

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8505

Northern Aplomado Falcon *Falco femoralis septentrionalis* — Endangered

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/1923

Piping Plover *Charadrius melodus* — Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/6039

Red Knot *Calidris canutus rufa* — Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/1864

Whooping Crane *Grus americana* — Endangered

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/758

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6199	Threatened

Hawksbill Sea Turtle Eretmochelys imbricata | Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/3656

Kemp's Ridley Sea Turtle Lepidochelys kempii | Endangered

There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/5523

Leatherback Sea Turtle Dermochelys coriacea | Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/1493

Loggerhead Sea Turtle Caretta caretta | Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/1110

Flowering Plants

NAME	STATUS
Slender Rush-pea Hoffmannseggia tenella No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5298	Endangered
South Texas Ambrosia Ambrosia cheiranthifolia No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3331	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

You should contact the local field office to determine whether critical habitat for the following species should be considered:

NAME	TYPE
Whooping Crane Grus americana https://ecos.fws.gov/ecp/species/758#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Golden-plover Pluvialis dominica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15

Black-legged Kittiwake Rissa tridactyla — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Bonaparte's Gull Chroicocephalus philadelphia — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Brown Pelican Pelecanus occidentalis — Breeds Jan 15 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/6034

Buff-breasted Sandpiper Calidris subruficollis — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9488

Clapper Rail Rallus crepitans — Breeds Apr 10 to Oct 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Common Loon gavia immer — Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4464

Common Tern Sterna hirundo — Breeds May 10 to Sep 10

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/4963

Double-crested Cormorant phalacrocorax auritus — Breeds Apr 20 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/3478

Dunlin Calidris alpina arcticola — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Herring Gull Larus argentatus — Breeds Apr 20 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

King Rail Rallus elegans — Breeds May 1 to Sep 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8936

Least Tern Sterna antillarum — Breeds Apr 20 to Sep 10

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-billed Curlew Numenius americanus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5511

Magnificent Frigatebird Fregata magnificens — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Marbled Godwit Limosa fedoa — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Northern Gannet Morus bassanus — Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-breasted Merganser Mergus serrator | Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Red-necked Phalarope Phalaropus lobatus | Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Reddish Egret Egretta rufescens | Breeds Mar 1 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/7617

Ring-billed Gull Larus delawarensis | Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Royal Tern Thalasseus maximus | Breeds Apr 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Ruddy Turnstone Arenaria interpres morinella | Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Seaside Sparrow Ammodramus maritimus | Breeds May 10 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Semipalmated Sandpiper Calidris pusilla — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Sooty Tern Onychoprion fuscatus — Breeds Mar 10 to Jul 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Whimbrel Numenius phaeopus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wilson's Plover Charadrius wilsonia — Breeds Apr 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (I)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

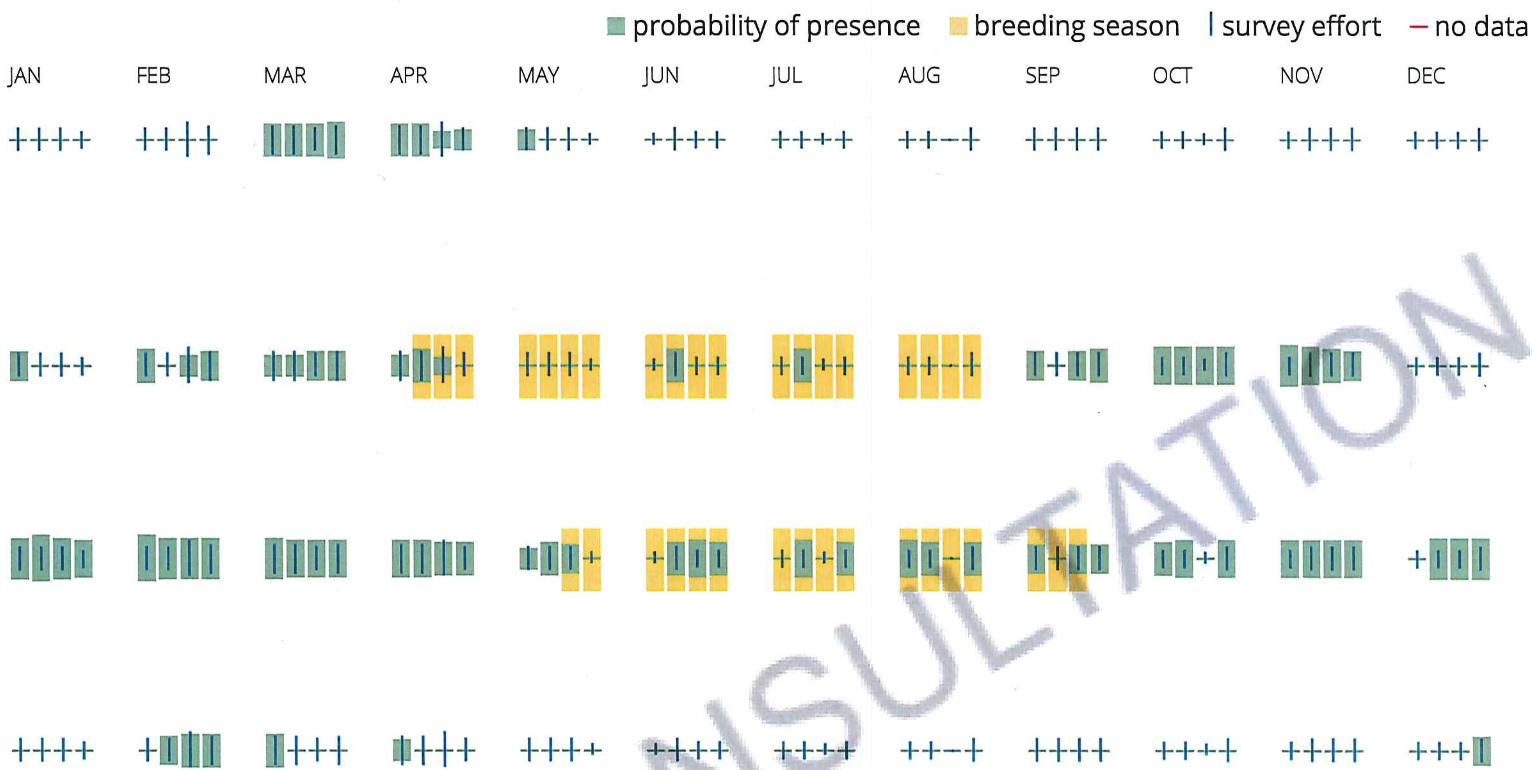
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

SPECIES



American Golden-plover
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

American Oystercatcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Black Skimmer
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Black-legged Kittiwake
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

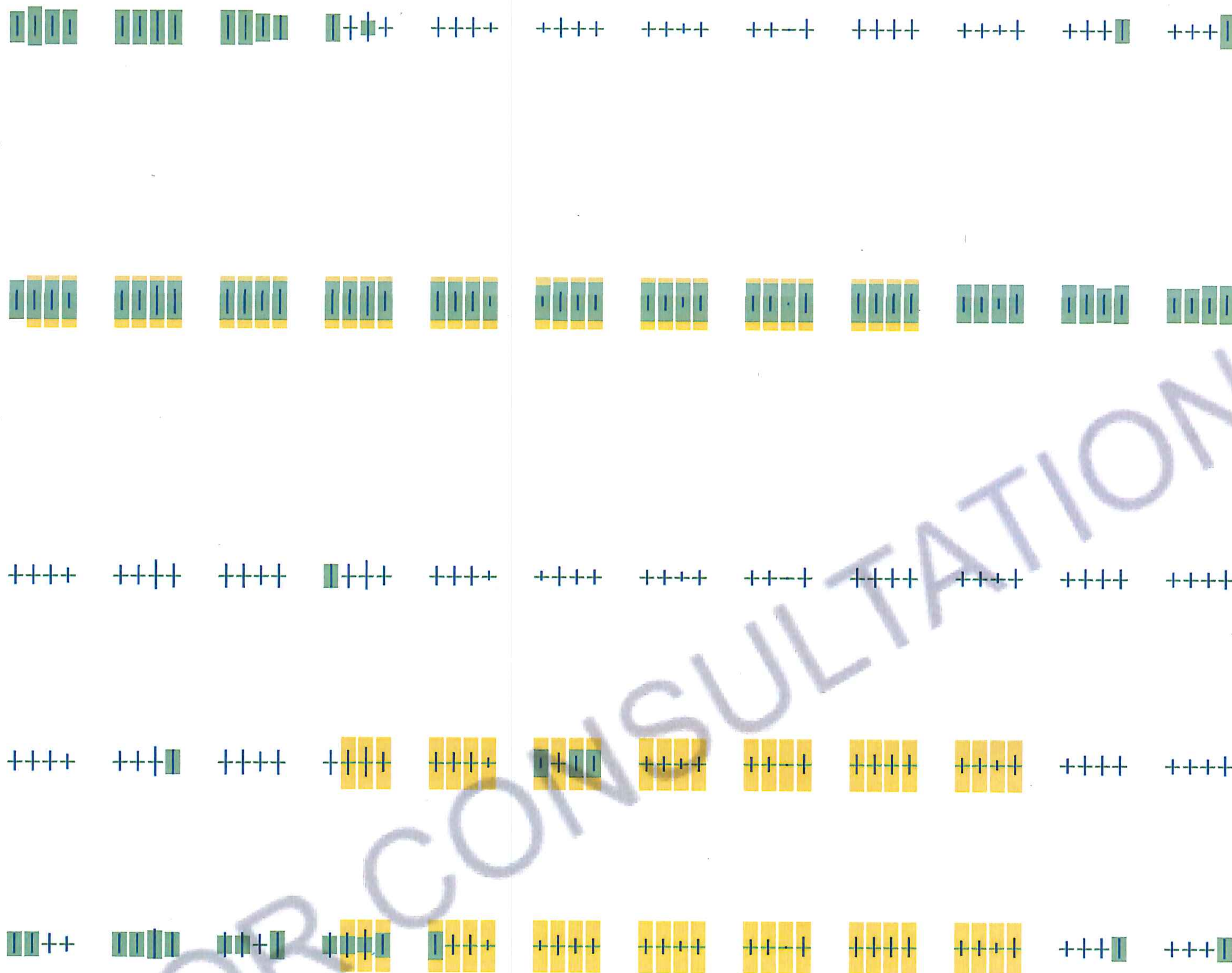
Bonaparte's Gull
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Brown Pelican
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

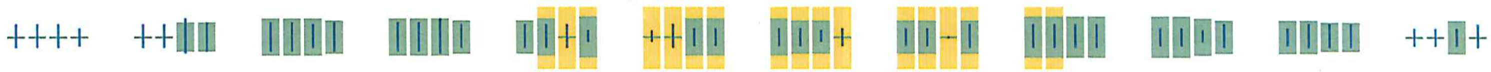
Buff-breasted Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Clapper Rail
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

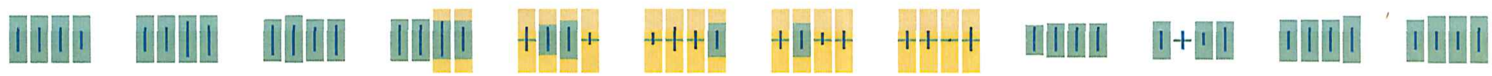
Common Loon
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



Common Tern
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



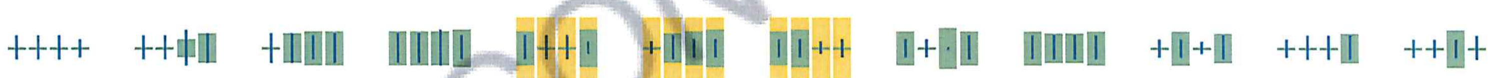
Double-crested Cormorant
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



Dunlin
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Gull-billed Tern
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Herring Gull
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

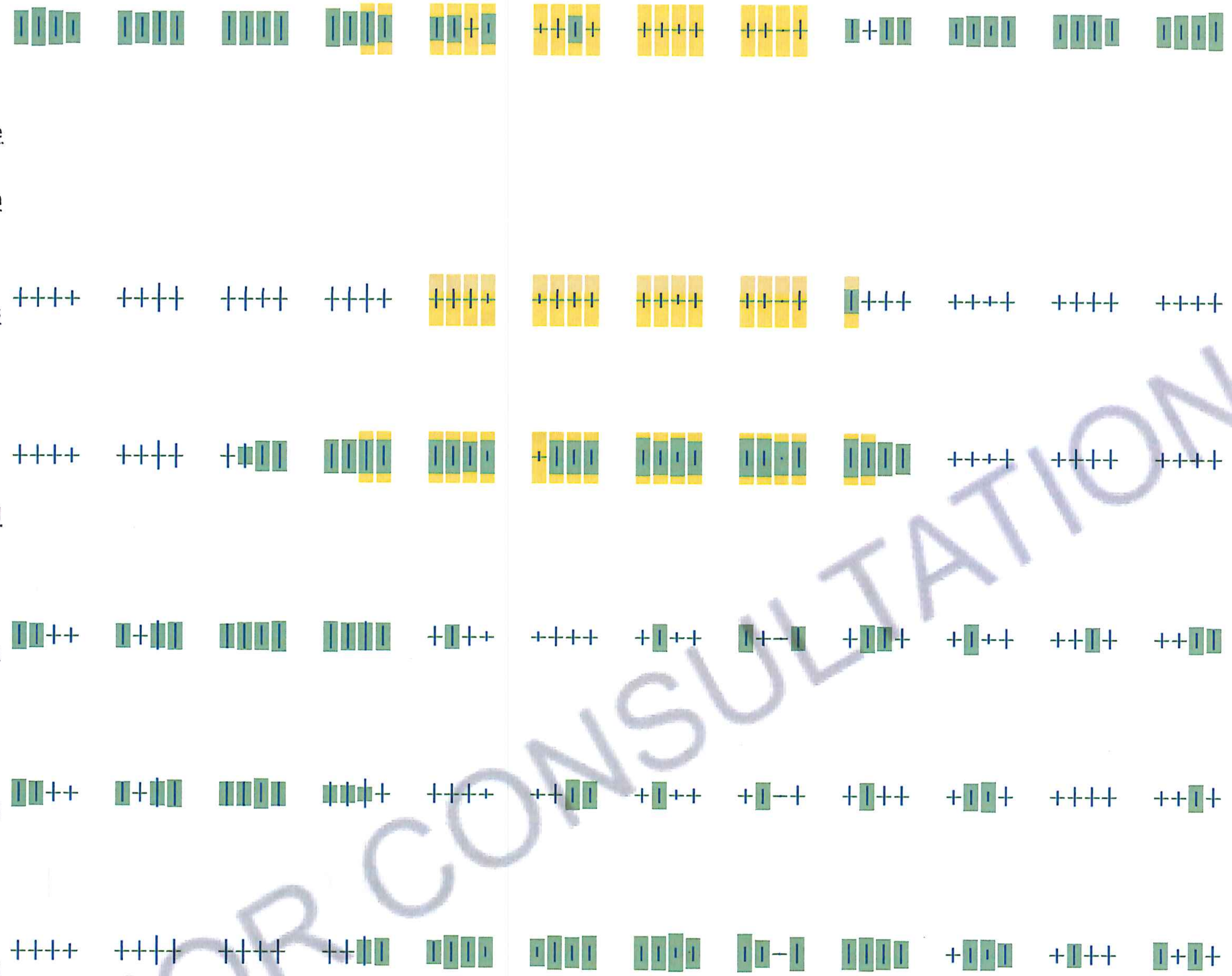
King Rail
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Least Tern
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Long-billed Curlew
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

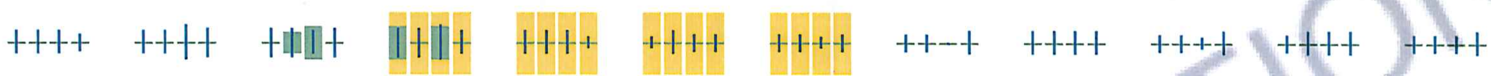
Magnificent Frigatebird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Marbled Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Northern Gannet
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

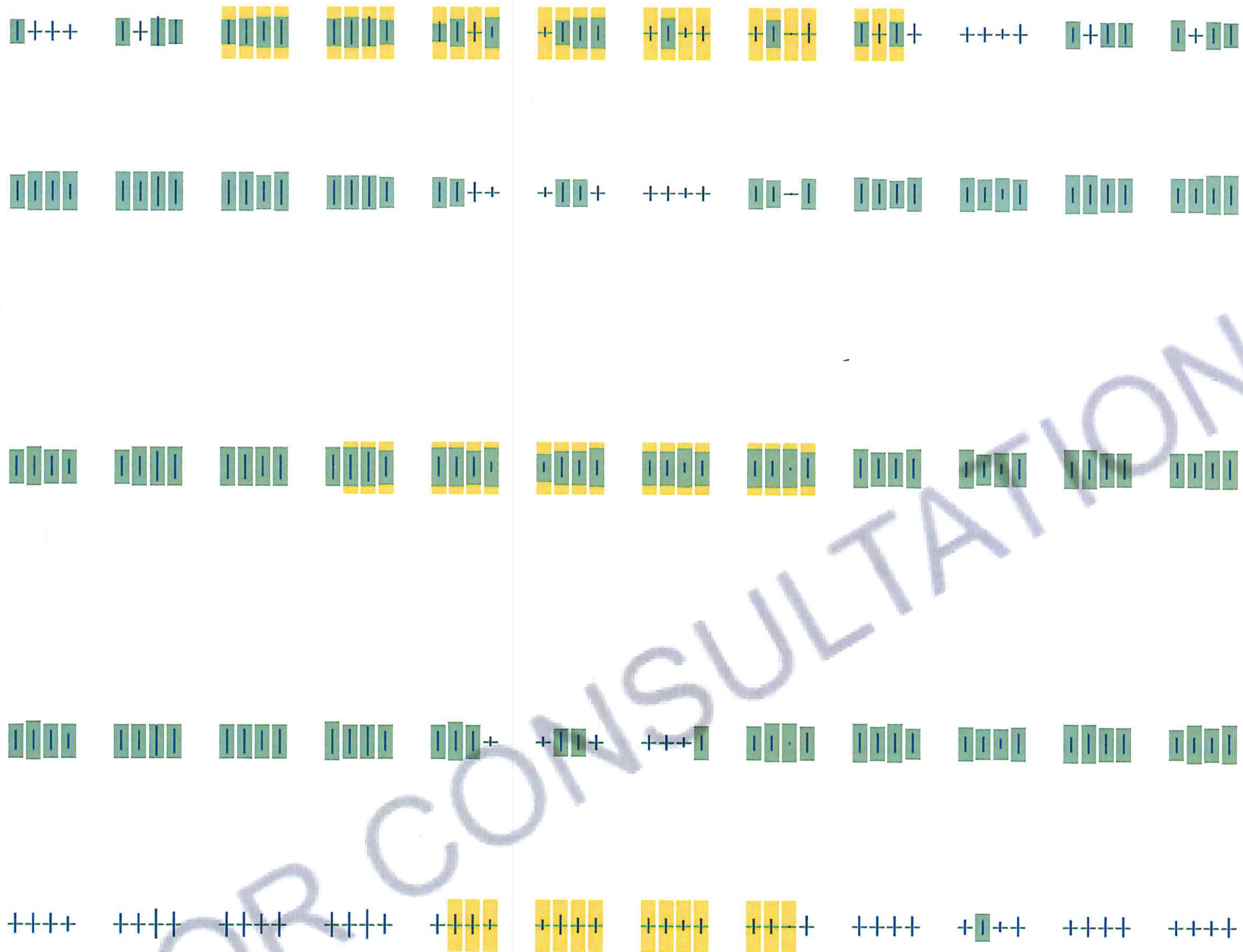
Prothonotary Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Red-breasted Merganser
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Red-necked Phalarope
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC



Reddish Egret
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Ring-billed Gull
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Royal Tern
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

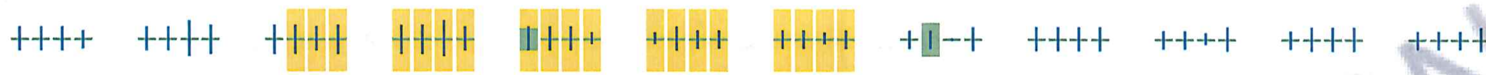
Ruddy Turnstone
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Seaside Sparrow
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

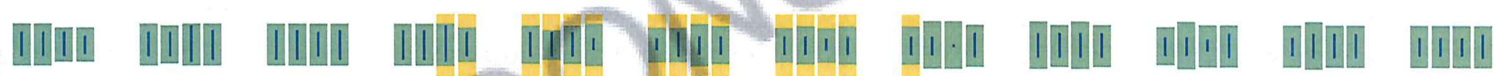
Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Sooty Tern
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

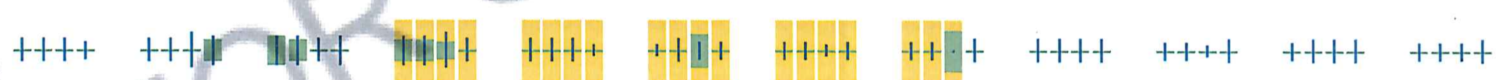


Whimbrel
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Wilson's Plover
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
https://ecos.fws.gov/ecp/species/4469

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER
  E1UBL

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Texas Coastal Ecological Services Field Office
17629 El Camino Real #211
Houston, TX 77058
Phone: (281) 286-8282 Fax: (281) 488-5882
http://www.fws.gov/southwest/es/TexasCoastal/
http://www.fws.gov/southwest/es/ES_Lists_Main2.html

In Reply Refer To:
Consultation Code: 02ETTX00-2019-SLI-1140
Event Code: 02ETTX00-2019-E-02352
Project Name: Project Turnpike

March 29, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) field offices in Clear Lake, Tx, and Corpus Christi, Tx, have combined administratively to form the Texas Coastal Ecological Services Field Office. A map of the Texas Coastal Ecological Services Field Office area of responsibility can be found at: http://www.fws.gov/southwest/es/TexasCoastal/Map.html. All project related correspondence should be sent to the field office responsible for the area in which your project occurs. For projects located in southeast Texas please write to: Field Supervisor; U.S. Fish and Wildlife Service; 17629 El Camino Real Ste. 211; Houston, Texas 77058. For projects located in southern Texas please write to: Field Supervisor; U.S. Fish and Wildlife Service; P.O. Box 81468; Corpus Christi, Texas 78468-1468. For projects located in six counties in southern Texas (Cameron, Hidalgo, Starr, Webb, Willacy, and Zapata) please write: Santa Ana NWR, ATTN: Ecological Services Sub Office, 3325 Green Jay Road, Alamo, Texas 78516.

The enclosed species list identifies federally threatened, endangered, and proposed to be listed species; designated critical habitat; and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project.

New information from updated surveys, changes in the abundance and distribution of species, changes in habitat conditions, or other factors could change the list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation for updates to species list and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Candidate species have no protection under the Act but are included for consideration because they could be listed prior to the completion of your project. The other species information should help you determine if suitable habitat for these listed species exists in any of the proposed project areas or if project activities may affect species on-site, off-site, and/or result in "take" of a federally listed species.

"Take" is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. In addition to the direct take of an individual animal, habitat destruction or modification can be considered take, regardless of whether it has been formally designated as critical habitat, if the activity results in the death or injury of wildlife by removing essential habitat components or significantly alters essential behavior patterns, including breeding, feeding, or sheltering.

Section 7

Section 7 of the Act requires that all Federal agencies consult with the Service to ensure that actions authorized, funded or carried out by such agencies do not jeopardize the continued existence of any listed threatened or endangered species or adversely modify or destroy critical habitat of such species. It is the responsibility of the Federal action agency to determine if the proposed project may affect threatened or endangered species. If a "may affect" determination is made, the Federal agency shall initiate the section 7 consultation process by writing to the office that has responsibility for the area in which your project occurs.

Is not likely to adversely affect - the project may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial. Certain avoidance and minimization measures may need to be implemented in order to reach this level of effects. The Federal agency or the designated non-Federal representative should seek written concurrence from the Service that adverse effects have been eliminated. Be sure to include all of the information and documentation used to reach your decision with your request for concurrence. The Service must have this documentation before issuing a concurrence.

Is likely to adversely affect - adverse effects to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species but also is likely to cause some adverse effects to individuals of that species, then the proposed action "is likely to adversely affect" the listed species. An "is likely to adversely affect" determination requires the Federal action agency to initiate formal section 7 consultation with this office.

No effect - the proposed action will not affect federally listed species or critical habitat (i.e., suitable habitat for the species occurring in the project county is not present in or adjacent to the action area). No further coordination or contact with the Service is necessary. However, if the project changes or additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.

Regardless of your determination, the Service recommends that you maintain a complete record of the evaluation, including steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related articles.

Please be advised that while a Federal agency may designate a non-Federal representative to conduct informal consultations with the Service, assess project effects, or prepare a biological assessment, the Federal agency must notify the Service in writing of such a designation. The Federal agency shall also independently review and evaluate the scope and contents of a biological assessment prepared by their designated non-Federal representative before that document is submitted to the Service.

The Service's Consultation Handbook is available online to assist you with further information on definitions, process, and fulfilling Act requirements for your projects at: http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf

Section 10

If there is no federal involvement and the proposed project is being funded or carried out by private interests and/or non-federal government agencies, and the project as proposed may affect listed species, a section 10(a)(1)(B) permit is recommended. The Habitat Conservation Planning Handbook is available at: http://www.fws.gov/endangered/esa-library/pdf/HCP_Handbook.pdf

Service Response

Please note that the Service strives to respond to requests for project review within 30 days of receipt, however, this time period is not mandated by regulation. Responses may be delayed due to workload and lack of staff. Failure to meet the 30-day timeframe does not constitute a concurrence from the Service that the proposed project will not have impacts to threatened and endangered species.

Proposed Species and/or Proposed Critical Habitat

While consultations are required when the proposed action may affect listed species, section 7(a)(4) was added to the ESA to provide a mechanism for identifying and resolving potential conflicts between a proposed action and proposed species or proposed critical habitat at an early planning stage. The action agency should seek conference from the Service to assist the action agency in determining effects and to advise the agency on ways to avoid or minimize adverse effect to proposed species or proposed critical habitat.

Candidate Species

Candidate species are species that are being considered for possible addition to the threatened and endangered species list. They currently have no legal protection under the ESA. If you find you have potential project impacts to these species the Service would like to provide technical assistance to help avoid or minimize adverse effects. Addressing potential impacts to these species at this stage could better provide for overall ecosystem healh in the local area and ay avert potential future listing.

Several species of freshwater mussels occur in Texas and four are candidates for listing under the ESA. The Service is also reviewing the status of six other species for potential listing under the ESA. One of the main contributors to mussel die offs is sedimentation, which smothers and suffocates mussels. To reduce sedimentation within rivers, streams, and tributaries crossed by a project, the Service recommends that that you implement the best management practices found at: http://www.fws.gov/southwest/es/TexasCoastal/FreshwaterMussels.html.

Candidate Conservation Agreements (CCAs) or Candidate Conservation Agreements with Assurances (CCAAs) are voluntary agreements between the Service and public or private entities to implement conservation measures to address threats to candidate species. Implementing conservation efforts before species are listed increases the likelihood that simpler, flexible, and more cost-effective conservation options are available. A CCAA can provide participants with assurances that if they engage in conservation actions, they will not be required to implement additional conservation measures beyond those in the agreement. For additional information on CCAs/CCAAs please visit the Service's website at http://www.fws.gov/endangered/what-we-do/cca.html.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions for the protection of migratory birds. Under the MBTA, taking, killing, or possessing migratory birds is unlawful. Many may nest in trees, brush areas or other suitable habitat. The Service recommends activities requiring vegetation removal or disturbance avoid the peak nesting period of March through August to avoid destruction of individuals or eggs. If project activities must be conducted during this time, we recommend surveying for active nests prior to commencing work. A list of migratory birds may be viewed at http://www.fws.gov/migratorybirds/regulationspolicies/mbta/mbtandx.html.

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the Act on August 9, 2007. Both the bald eagle and the goden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to "disturb" eagles. Under the BGEPA, the Service may issue limited permits to incidentally "take" eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For more information on bald and golden eagle management guidlines, we recommend you review information provided at http://www.fws.gov/midwest/eagle/pdf/NationalBaldEagleManagementGuidelines.pdf.

The construction of overhead power lines creates threats of avian collision and electrocution. The Service recommends the installation of underground rather than overhead power lines whenever possible. For new overhead lines or retrofitting of old lines, we recommend that project developers implement, to the maximum extent practicable, the Avian Power Line Interaction Committee guidelines found at http://www.aplic.org/.

Meteorological and communication towers are estimated to kill millions of birds per year. We recommend following the guidance set forth in the Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning, found online at: http://www.fws.gov/habitatconservation/communicationtowers.html, to minimize the threat of avian mortality at these towers. Monitoring at these towers would provide insight into the effectiveness of the minimization measures. We request the results of any wildlife mortality monitoring at towers associated with this project.

We request that you provide us with the final location and specifications of your proposed towers, as well as the recommendations implemented. A Tower Site Evaluation Form is also available via the above website; we recommend you complete this form and keep it in your files. If meteorological towers are to be constructed, please forward this completed form to our office.

More information concerning sections 7 and 10 of the Act, migratory birds, candidate species, and landowner tools can be found on our website at: http://www.fws.gov/southwest/es/TexasCoastal/ProjectReviews.html.

Wetlands and Wildlife Habitat

Wetlands and riparian zones provide valuable fish and wildlife habitat as well as contribute to flood control, water quality enhancement, and groundwater recharge. Wetland and riparian vegetation provides food and cover for wildlife, stabilizes banks and decreases soil erosion. These areas are inherently dynamic and very sensitive to changes caused by such activities as overgrazing, logging, major construction, or earth disturbance. Executive Order 11990 asserts that each agency shall provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial value of wetlands in carrying out the agency's responsibilities. Construction activities near riparian zones should be carefully designed to minimize impacts. If vegetation clearing is needed in these riparian areas, they should be re-vegetated with native wetland and riparian vegetation to prevent erosion or loss of habitat. We recommend minimizing the area of soil scarification and initiating incremental re-establishment of herbaceous vegetation at the proposed work sites. Denuded and/or disturbed areas should be re-vegetated with a mixture of native legumes and grasses. Species commonly used for soil stabilization are listed in the Texas Department of Agriculture's (TDA) Native Tree and Plant Directory, available from TDA at P.O. Box 12847, Austin, Texas 78711. The Service also urges taking precautions to ensure sediment loading does not occur to any receiving streams in the proposed project area. To prevent and/or minimize soil erosion and compaction associated with construction activities, avoid any unnecessary clearing of vegetation, and follow established rights-of-way whenever possible. All machinery and petroleum products should be stored outside the floodplain and/or wetland area during construction to prevent possible contamination of water and soils.

Wetlands and riparian areas are high priority fish and wildlife habitat, serving as important sources of food, cover, and shelter for numerous species of resident and migratory wildlife. Waterfowl and other migratory birds use wetlands and riparian corridors as stopover, feeding, and nesting areas. We strongly recommend that the selected project site not impact wetlands and riparian areas, and be located as far as practical from these areas. Migratory birds tend to concentrate in or near wetlands and riparian areas and use these areas as migratory flyways or corridors. After every effort has been made to avoid impacting wetlands, you anticipate unavoidable wetland impacts will occur; you should contact the appropriate U.S. Army Corps of Engineers office to determine if a permit is necessary prior to commencement of construction activities.

If your project will involve filling, dredging, or trenching of a wetland or riparian area it may require a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers (COE). For permitting requirements please contact the U.S. Corps of Engineers, District Engineer, P.O. Box 1229, Galveston, Texas 77553-1229, (409) 766-3002.

Beneficial Landscaping

In accordance with Executive Order 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping (42 C.F.R. 26961), where possible, any landscaping associated with project plans should be limited to seeding and replanting with native species. A mixture of grasses and forbs appropriate to address potential erosion problems and long-term cover should be planted when seed is reasonably available. Although Bermuda grass is listed in seed mixtures, this species and other introduced species should be avoided as much as possible. The Service also recommends the use of native trees, shrubs, and herbaceous species that are adaptable, drought tolerant and conserve water.

State Listed Species

The State of Texas protects certain species. Please contact the Texas Parks and Wildlife Department (Endangered Resources Branch), 4200 Smith School Road, Austin, Texas 78744 (telephone 512/389-8021) for information concerning fish, wildlife, and plants of State concern or visit their website at: http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/texas_rare_species/listed_species/.

If we can be of further assistance, or if you have any questions about these comments, please contact 281/286-8282 if your project is in southeast Texas, or 361/994-9005, ext. 246, if your project is in southern Texas. Please refer to the Service consultation number listed above in any future correspondence regarding this project.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Texas Coastal Ecological Services Field Office
17629 El Camino Real #211
Houston, TX 77058
(281) 286-8282

Project Summary

Consultation Code: 02ETTX00-2019-SLI-1140

Event Code: 02ETTX00-2019-E-02352

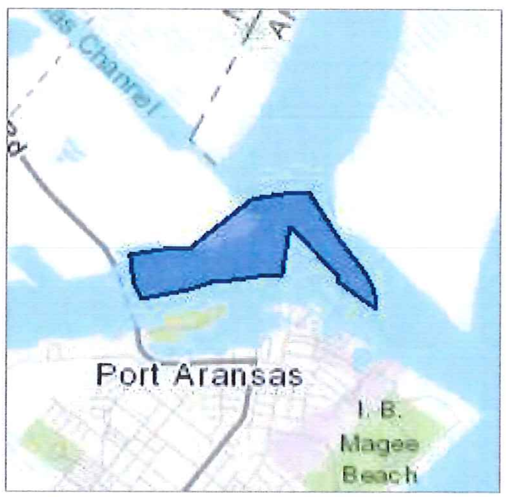
Project Name: Project Turnpike

Project Type: ** OTHER **

Project Description: Three new marine berths and turning basin

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/27.844825071486227N97.063214305434W



Counties: Aransas, TX | Nueces, TX

Endangered Species Act Species

There is a total of 16 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gulf Coast Jaguarundi *Herpailurus (=Felis) yagouaroundi cacomitli* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3945	Endangered
Ocelot *Leopardus (=Felis) pardalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4474	Endangered
West Indian Manatee *Trichechus manatus* There is **final** critical habitat for this species. Your location is outside the critical habitat. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/4469	Threatened

Birds

NAME	STATUS
Attwater's Greater Prairie-chicken *Tympanuchus cupido attwateri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7259	Endangered
Least Tern *Sterna antillarum* Population: interior pop. No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ Wind Related Projects Within Migratory Route Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Northern Aplomado Falcon *Falco femoralis septentrionalis* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1923	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Hawksbill Sea Turtle *Eretmochelys imbricata* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3656	Endangered
Kemp's Ridley Sea Turtle *Lepidochelys kempii* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5523	Endangered
Leatherback Sea Turtle *Dermochelys coriacea* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1493	Endangered
Loggerhead Sea Turtle *Caretta caretta* Population: Northwest Atlantic Ocean DPS There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1110	Threatened

Flowering Plants

NAME	STATUS
Slender Rush-pea *Hoffmannseggia tenella* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5298	Endangered
South Texas Ambrosia *Ambrosia cheiranthifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3331	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix K

Cultural Resources Information

TEXAS HISTORIC SITES atlas (/)
history on your desktop

TEXAS HISTORICAL COMMISSION (http://www.thc.texas.gov/)
real places telling real stories

HOME (/) ATLAS MAP (/MAP) ADVANCED SEARCH (/ADVANCEDSEARCH) ABOUT ATLAS (/ABOUT) DOWNLOADS (/DATA/DATADOWNLOAD)

Details for Aransas Pass Light Station

Historical Marker — Atlas Number 5007000184

Data

Marker Number	184
Atlas Number	5007000184
Marker Title	Aransas Pass Light Station
Index Entry	Aransas Pass Light Station
Address	off SH 361
City	Port Aransas
County	Aransas
UTM Zone	14
UTM Easting	691356
UTM Northing	3083670
Subject Codes	design and construction; lighthouses; water topics
Marker Year	1973
Designations	
Marker Location	About 2 miles NE of E end of Port Aransas (on Harbor Island), private and only accessible by boat
Marker Size	18" x 28"

Marker Text	Construction of 67-foot tower was started in 1855. The French lens was lighted in 1856, to mark natural Gulf pass to Aransas and Corpus Christi Bays by way of Lydia Ann Channel -- named for the daughter of the first keeper. During Civil War, Confederates (in 1863) buried lens for safety before damaging tower to avert use of light by Federal forces. The auxiliary structures were rebuilt after 1919 hurricane. One of original Texas stations of U.S. Lighthouse Service (merged into the Coast Guard in 1939), this light was decommissioned in 1952 after pass shifted southward. (1973) INCISE ON BASE: Lighthouse not open to public. INCISE ON BACK OF MARKER: Restored in 1972 by Charles C. Butt

ATLAS_NUM=5007000184

Location Map

TEXAS HISTORICAL COMMISSION
real places telling real stories

(//thc.state.tx.us)

Texas Homeland Security (http://www.texashomelandsecurity.com/) | Texas Veterans Portal (http://www.texvet.org/partners/texgov) | Texas.gov (http://www.texas.gov) TRAIL Search (https://www.tsl.state.tx.us/trail/index.html) | Site Map (http://www.thc.texas.gov/sitemap) | Policies (http://www.thc.texas.gov/policies) | Archeological Log In (/Account/Login?Length=5)

Details for Aransas Pass, C.S.A.

Historical Marker — Atlas Number 5355000185

Data

Marker Number	185
Atlas Number	5355000185
Marker Title	Aransas Pass, C.S.A.
Index Entry	Aransas Pass, C.S.A.
Address	SH 361 and Ferry Landing in Roberts Point Park
City	Port Aransas
County	Nueces
UTM Zone	14
UTM Easting	690740
UTM Northing	3081131
Subject Codes	Civil War; military topics
Marker Year	1995
Designations	
Marker Location	at Intersection of SH 361 and Ferry Landing at Far East end of Roberts Point Park, Port Aransas
Marker Size	27" x 42"

Marker Text	Aransas Pass, the natural inlet (3 miles east) to Aransas Bay, separates San Jose and Mustang Islands. These islands are part of a chain of barrier islands which extend along the entire length of Texas' Coastal Mainland. At the beginning of the civil war countless small vessels transported confederate supplies up and down the Texas and northern Mexican Coast virtually undisturbed by federal naval forces. Cotton destined for foreign markets moved freely through Aransas Pass. By early 1861 a union blockade had halted trafficking by confederate vessels beyond the barrier islands. However, confederate supplies inside the barrier chain continued and inlets such as Aransas Pass became sites of increasingly strategic military value. The Aransas Pass area came under the control of Federal Captain J.W. Kittredge's Naval Forces until his capture in September 1862. In November 1863 a massive federal force gained control of the south Texas Coast from the Rio Grande to Matagorda Bay. Eventually, Federal Forces lost control of the mainland behind Aransas Pass and in June 1864 withdrew from the area. Afterward, confederate ships successfully eluded the federal blockade and delivered vital supplies to the confederacy by way of Aransas Pass. Sesquicentennial of Texas Statehood 1845-1995.

ATLAS_NUM=5355000185

Location Map

TEXAS HISTORICAL COMMISSION
real places telling real stories

(//thc.state.tx.us)

Details for Mustang Island

Historical Marker — Atlas Number 5507015857

Data

Marker Number	15857
Atlas Number	5507015857
Marker Title	Mustang Island
Index Entry	Mustang Island
Address	101 E. Brundrett
City	Port Aransas
County	Nueces
UTM Zone	14
UTM Easting	690931
UTM Northing	3080483
Subject Codes	islands, settlements
Marker Year	2009
Designations	
Marker Location	
Marker Size	27" x 42"

Marker Text	Port Aransas is located on Mustang Island, one of seven Texas barrier islands. It is named for the wild horses that came here from shipwrecks and Spanish expeditions, and which once populated the island. The earliest humans here were members of nomadic groups collectively known as the Karankawas; they stayed on or about the islands in winter and fall, before moving inland during spring and summer. Robert Ainsworth Mercer (1799-1875) was Mustang Island's first settler; he came here in 1855 with his wife Agnes and children Mary Agnes, John and Edward. The Mercers built a house and a complex they named El Mar Rancho (Sea Ranch). Other settlers soon joined them, forming a small community; however, the new settlement was abandoned during the Civil War, when the USS Arthur took station off Mustang Island to blockade the Aransas Pass. The Federal sailors lived off the land, prompting six settlers to fire on them on February 11, 1862. The USS Arthur bombarded the island and a landing party further damaged property, leading to the islanders' flight from the island. Settlers returned here after the war, with many engaging in the booming cattle industry. By the 1880s, when the industry declined, islanders found markets for turtles and wild ducks. Many also offered goods and services, including guidance to hunting and fishing grounds, to workers constructing the Aransas Pass Jetties. Sportsmen began to visit the island, and by the 1920s tourism became the basis for its economy. By 1929, two roadways and a ferry service allowed for easier access to the island and further development of the tourist industry. Today, Mustang Island continues to be a popular destination for visitors, while also serving as home to increasing numbers of Texans. (2009)

ATLAS_NUM=5507015857

Location Map

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Details for Tarpon Inn

Historical Marker — Atlas Number 5355005194

Data

Marker Number	5194
Atlas Number	5355005194
Marker Title	Tarpon Inn
Index Entry	Tarpon Inn
Address	200 East Cotter Ave.
City	Port Aransas
County	Nueces
UTM Zone	14
UTM Easting	691000
UTM Northing	3080750
Subject Codes	inns, hotels, motels
Marker Year	1979
Designations	
Marker Location	200 East Cotter Avenue, Port Aransas
Marker Size	27" x 42"

Marker Text	In 1886 Frank Stephenson, a boat pilot and assistant Aransas lighthouse keeper, opened an inn at this site in an old barracks. He called the facility "Tarpon Inn" for the abundant trophy fish in nearby gulf waters. The Inn served as a landmark for sailors, and Port Aransas was known for a time as "Tarpon". In 1897 Mary Cotter and her son J.E. Bought the two story inn from Stephenson. After the building burned in 1900, two new structures were built in 1904. When the 1919 hurricane destroyed the main structure, the dining facility was used until it was sold in 1923 to James M. Ellis and his wife. Ellis soon rebuilt this inn to resemble the old barracks. He placed 20-foot poles in 16 feet of concrete with pilings at the corner of each room to reinforce it against future hurricanes. For a time guests could reach the inn only by boat. It became a tradition to sign and date a Tarpon scale and place it on the wall in the front room. Among the famous patrons was president Franklin D. Roosevelt who fished here in 1937. Duncan Hines spent his honeymoon here and recommended the food for the next 25 years. The inn has housed many area residents during storms and served as headquarters for the Red Cross, Salvation Army and Military units.

ATLAS_NUM=5355005194

Location Map

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Details for The Mercer Family on Mustang Island

Historical Marker — Atlas Number 5507016851

Data

Marker Number	16851
Atlas Number	5507016851
Marker Title	The Mercer Family on Mustang Island
Index Entry	Mercer Family, The, on Mustang Island
Address	101 E. Brundrett
City	Port Aransas
County	Nueces
UTM Zone	14
UTM Easting	690946
UTM Northing	3080503
Subject Codes	water topics; islands; boats, ships, ferries, barges, and other marine vessels
Marker Year	2011
Designations	
Marker Location	In front of Port Aransas Museum on the grassy esplanade (City of Port Aransas property) at the corner of Brundrett and Alister Streets
Marker Size	18" x 28"

Marker Text	THE MERCER FAMILY ON MUSTANG ISLAND ROBERT AINSWORTH MERCER (1799-1875) ARRIVED ON MUSTANG ISLAND CA. 1855. AFTER STARTING A SMALL SETTLEMENT, MERCER WAS APPOINTED NUECES COUNTY'S WRECK MASTER, WITH OVERSIGHT OF THE DISPOSITION OF VESSELS LOST CROSSING ARANSAS PASS. HIS SONS, JOHN (1840-1896) AND EDWARD (NED) (1842-?), SERVED AS ARANSAS PASS BAR PILOTS. IN 1880, JOHN BECAME THE FIRST KEEPER OF THE ARANSAS LIFE SAVING STATION, WHICH LATER BECAME THE U.S. COAST GUARD STATION THAT CONTINUES TODAY. THE ACTIVITIES OF THE MERCER FAMILY WERE DOCUMENTED IN EXHAUSTIVE JOURNALS FROM 1866 THROUGH 1877 AND THESE TEXTS WERE PRESERVED BY SUCCESSIVE MERCER DESCENDANTS, RECOGNIZING THE FAMILY'S INFLUENCE ON THE AREA'S HISTORY. 175 YEARS OF TEXAS INDEPENDENCE * 1836-2011

ATLAS_NUM=5507016851

Location Map

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Details for United States Coast Guard on Mustang Island

Historical Marker — Atlas Number 5507015257

Data

Marker Number	15257
Atlas Number	5507015257
Marker Title	United States Coast Guard on Mustang Island
Index Entry	United States Coast Guard on Mustang Island
Address	
City	Port Aransas
County	Nueces
UTM Zone	14
UTM Easting	690792
UTM Northing	3081100
Subject Codes	
Marker Year	2008
Designations	
Marker Location	Roberts Point Park, J. C. Barr Blvd (east end of park)
Marker Size	27" x 42"

Marker Text	Aransas Pass has significantly influenced the economic development of the region. The natural waterway also has included treacherous navigational hazards. In 1878, the U. S. government addressed this situation when it established the first Aransas Life Saving Station on Mustang Island, at Cotter and Station Streets. The station served the regional waters for several decades, but was destroyed by wind and storm surge flooding during the 1919 hurricane. The Coast Guard on Mustang Island served out of an interim facility until 1925 when the second life saving station opened. Erosion of the second station's concrete foundation, combined with an increasing workload, resulted in the structure's replacement in 1976. In January 1915, President Woodrow Wilson signed a Congressional act combining the Colonial era Revenue Cutter Service and the Life Saving Service (est. 1878) into the U. S. Coast Guard. In times of war, the Coast Guard joined the nation's military. During World War II, the primary lifesaving mission at Mustang Island grew to encompass the Ports, Waterways, Coastal Security mission that required the Coast Guard to watch for enemy naval activity. Roving Coastguardsmen and canine patrols monitored against incursion by enemy agents and saboteurs. In the early 21st century, the War on Terrorism altered the primary life saving orientation of the Coast Guard once again. The new mission structure required the Coast Guard to board vessels entering through the Aransas Pass to examine documentation and inspect cargoes. From the Port of Corpus Christi, U. S. military Sealift Command vessels carrying armored vehicles and other materials to theaters of war were escorted by armed Coast Guard crafts. As a result, the Coast Guard on Mustang Island continued to safeguard lives and provide security. (2008)

ATLAS_NUM=5507015257

Location Map

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Details for World War II Coastal Defenses at the Aransas Pass

Historical Marker — Atlas Number 5507015267

Data

Marker Number	15267
Atlas Number	5507015267
Marker Title	World War II Coastal Defenses at the Aransas Pass
Index Entry	World War II Coastal Defenses at the Aransas Pass
Address	311 J.C. Barr Blvd.
City	Port Aransas
County	Nueces
UTM Zone	14
UTM Easting	690691
UTM Northing	3081116
Subject Codes	World War II; military topics
Marker Year	2005
Designations	
Marker Location	311 J.C. Barr Blvd., Roberts Point Park
Marker Size	27" x 42"

Marker Text	In the late 1700s, the U.S. began a coastal defense system to protect ports and strategic points. Texas, which became a state in 1845, featured several gulf coast sites that would prove important in U.S. Military engagements in the 19th century and later. In March 1941, before the U.S. entered World War II, the War Department created the Southern Defense Command (SDC) as part of its national defense system. Led by Lt. Gen. Walter Krueger, the SDC included the southern U.S. coastline from North Carolina to Brownsville. After the Japanese bombed Pearl Harbor (Dec. 7, 1941), the U.S. increased defense efforts along the Texas coast, which included several military bases as well as key wartime industries. A month later, in what may have been a false alarm, a German U-Boat, or submarine, was reported just miles off the entrance to the Aransas Pass. The SDC dispatched a temporary field artillery battery of the 2nd Infanty Division to Mustang Island, where they set up 105 mm Howitzers. In April 1942, relief came to these troops when Battery E, 50th Coast Artillery Regiment arrived. The new troops remained until October 1942 and began emplacing two French-designed 155 mm GPF Guns on Panama mounts and building timber magazines, a commander station, searchlights and a camp for 360 men. Two companies later stationed there finished the work: Battery G, 20th Coast Artillery Regiment (Oct. 1942-Mar. 1944) and Battery E, 20th Coast Artillery Regiment (Mar.-Jul. 1944). In conjunction with the coast artillery, the U.S. Navy operated a harbor entrance control post. Officially designated as Temporary Harbor Defense at Aransas Pass, this coastal defense complex just south of the south jetty closed in July 1944, after enemy naval threats in the gulf were no longer a concern. (2005)

ATLAS_NUM=5507015267

Location Map

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Appendix L

Address of Adjoining Property Owners (from Nueces and San Patricio Counties)

Cross-Referenced Landowner List

Landowner Number	Name	Address	CITY	STATE	ZIP
1	ALVEY MERRI LEE & HUSB JO	PO BOX 10	MARBLE FALLS	TX	78654
2	BARNFAIR PROP/UTOTEM INC	1370 AVE OF AMERICAS	NEW YORK	NY	10019
3	CAPPS PHYLLIS J	P. O. BOX 1728	PORT ARANSAS	TX	78373
4	CITY OF PORT ARANSAS	710 W. AVENUE A	PORT ARANSAS	TX	78373
5	DEEP SEA PROPERTIES INC	P O BOX 388	PORT ARANSAS	TX	78373
6	DURHAM JOSEPH	225 S 16th St	LA PORTE	TX	77571
7	ERF PORT ARANSAS INC	555 N CARANCAHUA ST #700	CORPUS CHRISTI	TX	78401
8	GULLEYS DIVING SERVICE IN	P O BOX 521	PORT ARANSAS	TX	78373
9	HOWELL KEVIN T & WF CHRIS	1619 S 2nd St	AUSTIN	TX	78704
10	MARTIN OPERATING PARTNERS	4900 STONE RD	KILGORE	TX	75662
11	MILLER CHARLES K AND SHARON M MILLER WFE	PO BOX 5233	CORPUS CHRISTI	TX	78465
12	NORTON OWEN A	4003 BUNNY RUN	AUSTIN	TX	78746
13	PORT OF CORPUS CHRISTI	222 POWER STREET	CORPUS CHRISTI	TX	78401
14	PORT ARANSAS MARICULTURE CENTER - TEXAS A&M	1300 PORT STREET	CORPUS CHRISTI	TX	78403
15	STATE OF TEXAS	PO BOX 12608	AUSTIN	TX	78711
16	UNITED STATES OF AMERICA DEPT OF INTERIOR	1849 C STREET, N.W.	WASHINGTON	DC	20240
17	BASS BROTHERS ENTERPRISES, INC.	201 MAIN STREET, SUITE 250	FORT WORTH	TX	76102
18	TEXAS GENERAL LAND OFFICE	1700 CONGRESS AVENUE	AUSTIN	TX	78701
19	TXDOT	125 EAST 11TH STREET	AUSTIN	TX	78701
20	US COAST GRD	13411 HILLARD STREET	HOUSTON	TX	77034
21	TEAL HARBOR	200 WEST COTTER AVENUE	PORT ARANSAS	TX	78373
22	THE HARBOUR LUXURY CONDOMINIUMS	1726 HIGHWAY 361	PORT ARANSAS	TX	78373
23	CONDO.1659	116 WEST COTTER AVENUE	PORT ARANSAS	TX	78373
24	ELLIS WILLIAM R TRUST SUC	309 CAPE ARON DRIVE	CORPUS CHRISTI	TX	78412
25	FISHERMANS WHARF	P O BOX 387	PORT ARANSAS	TX	78373
26	URBAN JAMES L & MARK GROS	P O BOX 872	PORT ARANSAS	TX	78373
27	231 PORTA LLC	203 HUMBLE AVENUE	SAN ANTONIO	TX	78225
28	BRAMAN RANCHES LLC	PO BOX 400	VICTORIA	TX	77902
29	EDWARDS & RICHTER LLP	PO BOX 3185	PORT ARANSAS	TX	78373
30	MILLER CHARLES & SHARON MILLER	PO BOX 5253	CORPUS CHRISTI	TX	78465
31	C & F WEIL TRUST ETAL	500 N SHORELINE BLVD STE	CORPUS CHRISTI	TX	78401

Cross-Referenced Landowner List

32	SEUREAU GLENN	3214 INWOOD DR	HOUSTON	TX	77019
33	ABELL REALTY LMTD PARTNER	4608 CRESTWAY DR	AUSTIN	TX	78731
34	GROSSE RICHARD M ET UX	BOX 872	PORT ARANSAS	TX	78373
35	GUENTHER LIFE INSURANCE TRUST	153 TREELINE PARK STE 300	SAN ANTONIO	TX	78209
36	WATSON-PINBROOK INC	P.O. BOX 170155	ARLINGTON	TX	76003
37	MCALLISTER WALTER W III	4940 BROADWAY STE 104	SAN ANTONIO	TX	78209
38	WOODY'S INC	136 WEST COTTER AVENUE	PORT ARANSAS	TX	78373
39	PORTA CORPORATION	PO BOX 460968	SAN ANTONIO	TX	78246
40	TROUT STREET YACHT BASIN INC	P O BOX 170155	ARLINGTON	TX	76003
41	REBEL HOLDINGS LLC	311 SARATOGA BLVD	CORPUS CHRISTI	TX	78417
42	WISE GORDON E ET UX	P.O. BOX 398	PORT ARANSAS	TX	78373
43	VAUGHAN BEN F IV AND THE VAUGHAN BEN F III TRUSTEE	PO BOX 460968	SAN ANTONIO	TX	78246