APPENDIX V
DRAFT BEST MANAGEMENT PRACTICES PLAN

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BEST MANAGEMENT PRACTICE PLAN
BLUEWATER SPM PROJECT

Prepared for:

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LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

Applicant	Bluewater Texas Terminal LLC
ATWS	additional temporary workspace
BMP	best management practice
BOEM	Bureau of Ocean Management
bph	barrels per hour
BWTT	Bluewater Texas Terminal LLC
DWP	Deepwater Port
DWPA	Deepwater Port Act of 1974
e.g.	Latin for exempli gratia, meaning "for example"
EIA	Energy Information Administration
etc.	Latin for et cetera, meaning "and other similar things"
GOM	Gulf of Mexico
HDD	horizontal directional drilling
i.e.	Latin for in est, meaning "in other words"
MARAD	Maritime Administration
MBAT	Migratory Bird Treaty Act
MHT	Mean high tide
MMbpd	Million barrels per day
NWP	Nationwide Permit
OCS	Outer Continental Shelf
PLS	pure live seed
Project	Bluewater SPM Project
ROW	right(s)-of-way
ROW	Right-of-way
SPCC	Spill Prevention Control and Countermeasures
SPM	Single point mooring
SWPPP	Stormwater Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TPDES	Texas Pollutant Discharge Elimination System
U.S.	United States

1 Introduction

Bluewater Texas Terminal LLC (BWTT) is proposing to construct, own, and operate a deepwater port (DWP), associated pipeline infrastructure, and a booster station collectively known as the Bluewater SPM Project (Project), to provide a safe and environmentally responsible solution for the export of abundant domestic crude oil supplies from major shale basins.

The Project will involve the construction and operation of a DWP, associated pipeline infrastructure, and Booster Station, to allow for the loading of Very Large Crude Carriers (VLCC) at the proposed DWP via two single point mooring (SPM) buoy systems. The proposed Project design would allow for up to two (2) VLCCs, or other crude oil carriers, to moor at two (2) SPM buoy systems. The proposed Project is capable of simultaneously loading VLCCs and other crude oil carriers at rates of up to approximately 80,000 barrels per hour (bph) and throughput capacities of approximately 16 VLCCs per month.

Based on the Environmental Evaluation prepared for the Project under the Deepwater Port Licensing Act (DPLA), there is potential for negative impacts to environmental resources due to the nature of the construction methods utilized in a DWP design such as the project mentioned above. The following Draft Best Management Practices (BMP) Plan has been prepared to guide BWTT and any contractors constructing the DWP in the best practicable ways to avoid, minimize and mitigate any potential impacts.

Once the Project is authorized under the DPLA, the Applicant may deviate from these BMPs under circumstances in which a different measure provides equal or better environmental protection; or a BMP is infeasible or unworkable based on Project-specific conditions.

At this time, these BMPs are considered DRAFT, as modifications or amendments may be necessary as agency consultation is completed and permit conditions are issued for the Project.

2 Owner and Operator Information

Bluewater Texas Terminal LLC, Owner/Operator, is responsible for the design and construction of this Project and oversight of the construction activities. No other operators will be permitted at the construction location. BWTT is responsible for the implementation of the BMP Plan as the Applicant of the Deepwater Port License (DWPL) Application.

The responsibilities are therefore delegated as follows:

- Development of BMP Plan - Applicant/Contractor
- Selection of Erosion Controls and Maintenance of BMP Plan documents, including Site Maps - Applicant/ Contractor
- Installation and Maintenance of Erosion, Sedimentation and related Storm Water Controls - Applicant/ Contractor
- Maintenance of BMP Plan documents, including Site Maps - Applicant/Contractor
- Inspections and Reports - Applicant/Contractor

Owner/Operator Address:

Bluewater Texas Terminal LLC
2331 City West Blvd.
Houston, TX 77042

Contractor Information:

TBD

3 Project Overview

The Bluewater SPM Project, the "proposed Project," or, "Project," involves the design, engineering, and construction of a DWP, 56.48 miles of pipeline infrastructure, and a booster station. For the purposes of this DWPL application, the proposed Project is described in three distinguishable segments by locality including "onshore", "inshore", and "offshore".

Onshore components associated with the proposed Project are defined as those components landward side of the western Redfish Bay MHT line, located in San Patricio and Aransas Counties, Texas.

Onshore Project components includes approximately 22.20 miles of two (2) new 30-inch-diameter crude oil pipelines extending from the landward side of the MHT line of Redfish Bay to the planned multi-use terminal located south of the City of Taft in San Patricio County, Texas. The planned multi-use terminal will consist of multiple inbound and outbound crude oil pipelines. One of those outbound pipelines is the proposed pipeline infrastructure extending to the proposed Harbor Island Booster Station.

Inshore components associated with the proposed Project are defined as those components located between the western Redfish Bay MHT line and the MHT line located at the interface of San Jose Island and the GOM. Inshore Project components include approximately 7.15 miles of two (2) new 30-inch-diameter crude oil pipelines, and an approximate 19-acre booster station located on Harbor Island.

Offshore components associated with the proposed Project are defined as those components located seaward of the mean high tide (MHT) line located at the interface of San Jose Island and the Gulf of Mexico (GOM). The Offshore Project components include approximately 27.13 miles of two (2) new 30-inch-diameter crude oil pipelines extending to two (2) SPM buoy systems.

The proposed offshore pipelines would extend from the MHT line located at the interface of San Jose Island and the Gulf of Mexico (GOM) to the proposed SPM buoy systems. The offshore pipelines would intersect portions of Texas State submerged lease tracts 848, 849, 850, 851, 845, 721, 839, 838, 837, 693, 694, and 695, and Outer Continental Shelf (OCS) Mustang Island Area TX3 Bureau of Ocean Energy Management (BOEM) blocks 695, 696, 697, 698, and 699. The proposed DWP consists of two (2) SPM buoy systems which would be installed offshore, within the GOM, outside of U.S. territorial seas, within BOEM block number 698 and 699. The proposed SPM Buoy System 1 is positioned at Latitude 27.889361 and Longitude -96.651156 within BOEM block number 698 approximately 15.0 nautical miles (17.26 statute miles) off the coast of San Jose Island in San Patricio County, Texas. The proposed SPM Buoy System 2 is positioned at Latitude 27.902577 and Longitude -96.628119, within BOEM block number 699 approximately 1.7 miles northeast of SPM Buoy System 1. The proposed 27.13 miles of offshore pipeline infrastructure includes approximately 1.68 miles of two (2) 30-inch-diameter pipelines connecting SPM Buoy System 1 and 2.

Refer to Attachment 1 for a Project Component Map detailing the locations of the onshore, inshore, and offshore components associated with the proposed Project.

4 Site Description

The proposed project area is located within the Northern Humid Gulf Coastal Prairies (NHGCP) (34a) Ecoregion (Griffith, et al., 2007), a gently sloping, mostly flat, coastal plain. Drainage is generally poor and soils remain wet for parts of the year. The historical vegetation is mostly tallgrass grasslands.

From the far western extent of the proposed Project, Onshore Pipelines travel east along an existing right-of-way (ROW), through agricultural land and wind farms; the Onshore Pipelines' ROW then continues northeast, before passing Gregory approximately 1 mi (1.6 km) to its north, and moving directly east, continuing through agricultural pasture. Once the Onshore Pipelines are approximately 0.7 mi (1.1 km) northwest of The Falman Colonia, the Onshore Pipelines then turn southeast and travel through an agricultural and rural residential setting on the northeastern outskirts of Aransas Pass until they are approximately 0.5 mi (0.8 km) from the coastline. There they turn southwest and traverse parallel to the Union Pacific (UP) railway in a vegetated ROW within an urban setting on the outskirts of Aransas Pass City, until the Onshore Pipelines enter an area of light industry and finally turn southeast and towards the shoreline.

The Inshore Pipelines would cross the southern portion of San Jose Island, a barrier island located adjacent to Aransas Pass and the Mission-Aransas National Estuarine Research Reserve. San Jose Island is a privately-owned island that is managed principally for wildlife. The public is only allowed on beach areas, below the vegetation line; however, vehicles are prohibited (Port Aransas Chamber of Commerce and Tourist Bureau 2019).

Two smaller islands between San Jose Island and the mainland would also be crossed (Harbor Island and Stedman Island). Harbor Island is directly behind San Jose Island and is accessible from multiple named channels, one of which (Aransas Channel) splits the island into two halves. Harbor Island is zoned for industrial activity and is home to oil and gas facilities (Port of Corpus Christi [POCC] 2019a). Stedman Island is a smaller island between Harbor Island and the mainline, which is traversed by Texas State Highway 361 and powerlines and is also home to oil and gas facilities.

The Redfish Bay State Scientific Area (RBSSA) encompasses the majority of the inshore waters between the inland side of San Jose Island and the mainland and is bounded to the west and east by the Corpus Christi Channel and Aransas Bay, respectively. The RBSSA, which also includes South Bay, is designated as a State Scientific Area due to the approximately 32,000 acres (ac) (12,950 hectares [ha]) of biologically sensitive communities including seagrass beds, oyster reefs, marshes, and mangroves (Texas Parks and Wildlife Department [TPWD] 2019 a,b). Due to the presence of seagrasses and the potential for long-term scarring from propeller scars, TPWD recommends the use of airboats, johnboats, shallow water boats, or trolling motors when traversing shallow waters. Although anchoring is allowed in the area, it is illegal to allow the uprooting of any seagrass plants by submerged propeller (TPWD 2019a). The Inshore Pipelines will cross the RBSSA for a total of 6.5 mi (10.5 km); however, all open water areas will be crossed using horizonal directional drill (HDD). The installation of the Proposed Project inshore pipeline infrastructure involves the utilization of numerous construction techniques including HDD, bores, and open cut conventional excavation.

A majority of the wetlands identified within the proposed project area are palustrine emergent (PEM) and estuarine intertidal emergent (E2EM) wetlands followed by palustrine scrub-shrub (PSS), estuarine intertidal unconsolidated shore palustrine (E2USP) and estuarine intertidal scrub-shrub (E2SS) wetlands respectively.

Dominant vegetation within the PEM wetlands consisted of bushy seaside tansy (*Borrichia frutescens*), switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), saltmeadow cordgrass, smallflowered milkvetch (*Astragalus nuttallianus*), sand spikerush (*Eleocharis montevidensis*), woodrush flatsedge (*Cyperus entrerianus*), brownseed paspalum (*Paspalum plicatulum*), shoregrass (*Monanthochloe littoralis*), green flatsedge (*Cyperus virens*), five-stamen tamarisk (*Tamarix chinensis*), coastal saltgrass, and eastern baccharis (*Baccharis halimifolia*).

Dominant vegetation within the E2EM wetlands consisted of saltmeadow cordgrass, bushy seaside tansy, saltgrass, shoregrass, and dwarf saltwort (*Salicornia bigelovii*).

Dominant vegetation within the PSS wetlands consisted of marsh primrose-willow (*Ludwigia palustris*), Chinese tallow (*Triadica sebifera*), sand spike-rush, broom-sedge bluestem (*Andropogon virginicus*), common buttonbush (*Cephalanthus occidentalis*), bigpod sesbania (*Sesbania herbacea*), coastal salt grass, Brazilian peppertree, and saw greenbrier (*Smilax bona-nox*).

Wetlands identified as E2USP consist of mud flats or sand flats that are tidally influenced with sparsely vegetated surfaces that usually makes up less than five percent of total vegetative cover. Dominant vegetation within the E2USP mudflats consisted of saltgrass, bushy seaside tansy, and dwarf saltwort.

Dominant vegetation within the E2SS wetlands consisted of five-stamen tamarisk, bushy seaside tansy, and Brazilian peppertree.

The Harbor Island Booster Station occupies an approximate 19-acre area located on Harbor Island in Nueces County, Texas. The Harbor Island Booster Station would house the necessary pumping infrastructure to support the transport of crude oil through the Proposed Project pipeline infrastructure to the DWP for the loading of moored vessels. Additionally, the Harbor Island Booster Station would house the primary administration and operations building to support operations at the DWP.

The most sensitive portion of the Offshore Pipelines' route is near shore, where it passes through shallow water and makes landfall on San Jose Island. To avoid impacts on the coast of the barrier island, which includes estuarine wetlands and sensitive coastal dune habitat, the Offshore Pipelines will be installed by HDD at this location.

At the seaward edge of the HDD (about 3,900 ft [1,188.7 m] from shore), the Offshore Pipelines will cross soft-bottom habitats between the HDD Box to their interconnection with the SPM buoy systems about 17.0 mi (27.4 km) offshore. Offshore, trenching and backfilling for installation of the pipelines will be completed using a submersible pipeline jetting sled operated from an anchored pipe-laying barge. The pipelines will be buried a minimum of 3 ft (0.9 m) below the sediment surface.

The principle floating structures associated with the Project DWP includes two (2) SPM buoy systems each consisting of a catenary anchor leg mooring (CALM) system, pipeline end manifold (PLEM) system, mooring hawsers, floating hoses, and sub-marine hoses to allow for the loading of crude oil to vessels moored at the proposed DWP. The Proposed Project SPM Buoy System 1 would be anchored in approximately 88.5 feet of water at a designated location approximately 15.0 nautical miles (17.26 statute miles) off the coast of San Jose Island at Latitude 27.889361 and Longitude -96.651156. The Proposed Project SPM Buoy System 2 would be anchored in approximately 89.5 feet of water at Latitude 27.902577 and Longitude -96.628119, approximately 1.7 miles northeast of SPM Buoy System 1. The two proposed SPM buoy systems would be connected via 1.68 miles of two (2) 30-inch-diameter pipelines to allow for either the single or simulations loading at vessels.

Both Proposed Project SPM buoy systems will be of the CALM type consisting of a specifically arranged anchor chain system extending to 72-inch-diameter pile anchor piles installed on the seafloor. The proposed 72-inch-diameter pile anchor piles are positioned in a circular pattern with a horizontal radius of approximately 300 feet from the center of the SPM buoys. The CALM mooring system is designed to be capable of holding the position of the SPM buoy with a moored vessel under design operating conditions. The configuration of the CALM mooring system arrangement is designed to provide flexibility for the location of the PLEM and reduce potential interference with sub-marine hoses.

Both SPM buoy systems each utilize a PLEM system which serves as the primary manifold and connection point between offshore pipelines and the SPM buoys. Each of the proposed SPM buoy systems consist of a specialized PLEM to allow for either single or dual vessel loading operations at the DWP. The proposed PLEMs will connect

offshore pipelines to the SPM buoy systems through a series of 24-inch-diameter sub-marine hoses. The PLEM systems consist of a steel frame structure positioned directly beneath each of the proposed SPM buoys.

Refer to Attachment 1 for a Project Detail Maps depicting the workspaces and project site locations for the various components discussed above.

5 Best Management Practice Plan

5.1.1 Estimates of Total Construction Site Area

The estimated project construction site area (assumed disturbed) for the all construction activities totals approximately 707.89 acres. This area includes a standard width pipeline construction corridor for each segment and additional temporary workspace (ATWS) where needed to provide for safe and efficient installation of the pipeline. ATWS lengths will vary throughout the project but will typically extend 50 feet beyond the width of the proposed construction work area. ATWS areas also include equipment staging areas and HDD drill space where proposed. The Applicant has designed the construction ROW to minimize the space necessary to efficiently install the pipeline and minimize or avoid environmental impacts.

Workspace dimensions and descriptions are described in further detail for each segment of the proposed project discussed in the following sections. Refer to Attachment 1 for a Project Detail Maps depicting the workspaces and project site locations for the various components and segments of the Project.

5.1.2 Description of Proposed Construction Activities

For the purposes of this Draft BMP plan, the following sections for the installation of the proposed Project have been divided by project component to include the following:

1) Terrestrial Pipeline Installation
2) Horizontal Directional Drill (HDD)
3) Harbor Island Booster Station
4) Offshore Pipeline Installation
5) SPM Buoy System Installation

The following section presents a description of workspace and construction areas for each component, and the proposed BMPs that will be implemented at the Project site to minimize environmental impacts.

6 Best Management Practices

6.1 Terrestrial Pipeline Installation

The installation of the proposed onshore and inshore pipeline infrastructure will involve numerous construction techniques such as HDD, bores, and open cut conventional excavation in uplands, consolidated wetland soils, and unconsolidated soil areas. The two (2) 30-inch-diameter pipelines will be constructed using industry standards.

The Applicant proposes to install the onshore pipeline infrastructure within an approximate 125-foot-wide construction corridor, which will consist of a 75-foot-wide permanent Right of Way (ROW). During construction activities, additional temporary workspaces (ATWS) will be required beyond the width of the 125-foot-wide construction corridor at certain designated locations to provide the space necessary for safe and efficient installations of the proposed pipelines. The ATWS would be utilized where required for the storage of spoil, pipe, welding, pull strings, HDD entry and exit locations, and equipment access roads.

The Applicant proposes to install the inshore pipeline infrastructure within an approximate 100-foot-wide construction corridor. During construction activities, ATWS will be required beyond the width of the 100-foot-wide construction corridor at certain designated locations to provide the space necessary for safe and efficient installations of the proposed pipelines. The ATWS would be utilized where required for the temporary storage of spoil, pipe, welding, pull strings, HDD entry and exit locations, and equipment access roads.

Refer to Attachment 1 for a depiction of the proposed onshore and inshore pipeline alignments and the associated construction workspaces.

6.1.1 Terrestrial Pipeline Installation BMPs

Both temporary and permanent erosion and sediment controls will be used to control storm water and contain sediment on the site, where feasible, in accordance with a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will be implemented to minimize soil erosion and impacts on surface waters. All work will be conducted in accordance with a Texas Pollutant Discharge Elimination System (TPDES) General Permit No. TXR150000 for stormwater and TPDES General Permit No. TXR050000 for industrial wastewater meeting all provisions within the respective permit. BMPs may include, but are not limited to: establishment of vegetation, mulching, silt fence, hay or straw bales, geotextiles, vegetative buffer strips, protection of existing trees and vegetation, slope texturing, temporary velocity-dissipation devices, flow diversion mechanisms, and other similar measures.

The Applicant is responsible for implementing measures necessary to prevent the erosion of soil within the construction site limits and to prevent pollutant discharges through storm water outfalls on this project (see site map drawings). The site map drawings show the general locations of temporary erosion and sedimentation controls. These initial locations are intended to show where there is a potential for erosion that could be caused by the proposed construction activities. Supplemental erosion and sedimentation controls will be installed at stream crossings where necessary to minimize sediment discharge into waterbodies at the pipeline crossings.

6.1.1.1 Temporary Erosion Controls

The goals of the temporary controls are to manage and reduce pollutant discharges into storm water runoff from construction activities. Where field conditions dictate, temporary sediment barriers will be placed to control runoff from disturbed areas.

The overall implementation of erosion and sedimentation control methods are to prevent or reduce the amount of pollutants (typically sediment) from entering storm water runoff as follows:

- Install adequate controls on the downslope of construction ROW.
- Install adequate controls on the banks of streams and wetlands.
- Decrease erosion potential by minimizing clearing of vegetation.
- Re-establish vegetation in areas with potential erosion problems immediately following disturbing activities.
- Protect or remove stockpiled materials, especially if rain is forecasted.

REVEGETATION AND SEEDING

Temporary stabilization will be necessary in denuded areas to allow equipment to conduct proper grading activities. Seed all disturbed soils within 14 days of final grading as weather and soil conditions allow. On slopes steeper than 30 percent, seed immediately after final grading, weather permitting. Base seeding rates on pure live seed (PLS) and use seed within 12 months of seed testing. These areas should be seeded with a seed mixture of fescue/rye/ Bermuda grass or Texas Commission on Environmental Quality (TCEQ) approved seed mixture.

SILT FENCE/HAY/STRAW BALE INSTALLATION/GEOTEXTILE MATTING

Silt fence will be imbedded a minimum of 4 inches in the soils surface, and where two sections are joined, will overlap a minimum of 6 inches. Accumulated sediment will be removed regularly and the fence inspected to ensure that the bottom of the fence remains imbedded in the ground.

Hay/straw bales will be anchored in place with two stakes, the first stake driven at an angle toward the previously-positioned bale, and the second stake driven perpendicular to the ground surface. Bindings on bales will be horizontal and will not consist of wire. Bales will be replaced if damaged or if water is channeled underneath. An

adequate supply of bales will be stockpiled on-site for immediate need or routine placement. Additional silt fence/ hay/straw bales/geotextile matting may need to be installed as site conditions warrant.

TOPSOIL CONSERVATION

Topsoil is a nutrient-rich vegetative growth medium. During excavation, topsoil should be collected and stockpiled separately from subsoils. Conserved topsoil will be re-applied as top-dressing over backfilled trenches to facilitate vegetation regrowth.

Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus spoil side method) in agricultural parcels, residential areas and other areas at the landowner's request.

In all areas, importation of topsoil is not an acceptable alternative to topsoil segregation unless otherwise requested by landowner. Where topsoil segregation is required, the Applicant would:

1. Segregate at least 12 inches (30.5 centimeters) of topsoil in deep soils (more than 12 inches [30.5 centimeters] of topsoil); and

2. Make every effort to segregate the entire topsoil layer in soils with less than 12 inches (30.5centimeters) of topsoil.

The contactor will maintain separation of salvaged topsoil and subsoil throughout all construction activities. Stabilization methods for topsoil piles will be incorporated to minimize water and wind erosion loss to salvaged topsoil.

MULCHING

Mulching is a temporary soil stabilization and erosion control method that utilizes materials such as grass, hay, straw, or wood chips placed on the soils surface for stabilization. Mulching reduces the velocity of storm water runoff, thereby reducing its erosive forces; aids plant growth by anchoring the seeds, fertilizers, and topsoil; and retains moisture and insulates against extreme temperatures. Mulching can provide immediate and effective erosion control on the ROW. Mulch can be easily blown or washed away; as a result, it requires regular inspection.

Mulch should be applied on slopes within 100 feet of waterbodies and wetlands at a rate of no more than 3 tons/ acre. If wood chips are used as mulch, do not use more than 1 ton/acre; the addition of nitrogen (at least 50 percent is slow release) may be included.

If a mulch blower is used, the strands of the mulching material will be at least 8 inches long to allow anchoring and minimize loss by wind and water. When anchoring by mechanical methods, use a mulch anchoring tool to properly crimp the mulch to a depth of 2-3 inches. When anchoring with liquid mulch binders, use rates recommended by the manufacturer.

INTERCEPTOR DIKES

Interceptor dikes (earthen berms) are determined to be necessary to reduce velocity and divert storm water runoff from the construction ROW. Interceptor dikes were constructed of materials such as compacted soil and sandbags. Interceptor dikes should be constructed and maintained in all areas except cultivated areas and lawns. Interceptor dikes should be constructed with a 2-5 percent outslope to divert surface flow to a stable area. In the absence of a stable area, construct an energy-dissipating device at the end of the interceptor dike.

ROCK BERMS

Rock berms can be used in areas with high flow velocities (e.g., channels and outfalls) to filter sediment from water, reduce runoff velocity, and minimize erosion potential. Rock berms should be installed prior to land disturbance, when required. To prevent scouring and blow-outs, rock berms should be toed into the site soils. Clogged rock berms should be cleaned or replaced when excessive sediment fills the pore spaces and/or vegetation is growing

from the rock berm as it will prevent pass-through of storm water. Gabion baskets should be used when high flow conditions are expected.

STABILIZED CONSTRUCTION ENTRANCE/EXIT

Access to and from the project site, at paved public roads, will be compacted via a stabilized construction entrance (e.g., crushed stone, gravel, riprap, etc.). The stabilized access points will serve to reduce sediment tracking from the site. Inspect regularly, looking for evidence of off-site sediment tracking onto paved surface. Replenish aggregate as needed. Accumulated sediment that has been tracked out from the site onto paved areas, roads, and sidewalks must be removed by the end of the same work day in which the tracking occurs or by the end of the next work day if tracking occurs on a non-work day. You must remove the sediment by sweeping, shoveling, or vacuuming paved surfaces, or by using other similarly effective means of sediment removal.

6.1.1.2 Permanent Erosion Controls

Restoration of the ROW will begin after construction activities are completed. Restoration measures are permanent measures to assure that natural drainage patterns re-establish themselves and post-construction erosion is avoided. Property should be restored in accordance with landowner agreements. Elevations in jurisdictional wetlands and other waters of the U.S. require restoration of preconstruction contours. The following items will be conducted as soon as practicable.

CLEANUP

Cleanup operations should commence immediately following backfill operations. Complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls until conditions allow for the completion of cleanup.

A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed. When access is no longer required, the travel lane must be removed, and the right-of-way must be restored to pre-construction contours. Permanent erosion controls should be installed following the removal of temporary controls.

Remove construction debris from all construction work areas and grade or till the ROW to leave soil in proper condition for seeding and planting. Every effort to complete final cleanup of an area (including final grading and installation of permanent erosion control structures) should be completed immediately following construction completion. The disturbed ROW should be seeded as soon as possible after final grading as weather and soil conditions allow.

SOIL COMPACTION MITIGATION

Soil compaction mitigation should be conducted in in accordance with the SWPPP that will be developed prior to construction. In agricultural and residential areas, ensure the subsoil has been de-compacted via a plow or other deep tillage method prior to replacing topsoil. As appropriate, determine additional soil compaction mitigation methods in severely compacted areas.

REVEGETATION AND SEEDING

Generally, the Applicant should revegetate all disturbed areas in accordance with the SWPPP that will be developed prior to construction, Section 402 of the Clean Water Act, National Pollutant Discharge Elimination System, permit conditions of the U.S. Army Corps of Engineers (USACE) Section 404 Dredge and Fill Permit, or any other regulatory requirements obtained during the permitting phase of the Project.

Permanent stabilization consists of vegetative seeding in all remaining disturbed, unvegetated areas affected by construction. The following guidelines will be useful in establishing permanent vegetation in those areas disturbed by construction activities.

Seed disturbed areas with a seed mixture of fescue/rye/Bermuda grass, TCEQ-approved seed mixture, or as specified by the landowner. Consider seeding all disturbed areas with a seed mixture acceptable to landowner or comparable to the adjoining property. In residential areas, restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner.

Approved seed composition will be uniformly applied in accordance with the manufacturer's written recommendations. In the absence of any recommendations, prepare the seedbed in disturbed areas to a depth of 3-4 inches using appropriate equipment to provide a firm seedbed; a seed drill equipped with a cultipacker is preferred for application. Broadcast or hydro-seeding can be used at double the recommend seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker or roller after seeding.

Where hand-broadcast seeding is used, the seed will be applied at half the doubled rate in each of the two separate passes. The passes will be made perpendicular to each other to ensure complete and uniform coverage.

As needed, the Applicant may use soil additives, such as fertilizers or pH modifiers (i.e., lime), in accordance with recommendations obtained from the local soil conservation authority or landowner. To facilitate adequate growth and rehabilitation, post construction monitoring would help ensure that ground disturbance and restoration activities are handled in an environmentally sensitive manner.

6.1.1.3 Entrances/Exits

The construction entrances/exits and staging areas will be cleaned regularly to keep them clear of debris and materials. A stabilized construction entrance will be utilized to minimize off-site vehicle tracking. Dust suppression activities such as watering exposed soils and traffic management, will be employed to reduce nuisance conditions.

6.1.1.4 Road Crossings and Access Points

All public road crossings will be crossed by either HDD or bore construction technique. Should an HDD or bore be unsuccessful the Applicant will coordinate with the relevant county or local highway department to determine the best times for temporary road closures to minimize impacts on local traffic.

If crushed stone access pads are used in residential or agricultural areas, place the stone on synthetic fabric to facilitate removal.

The use of tracked equipment on public roadways will be minimized. Remove any soil or gravel spilled or tracked onto roadways daily, or more frequently, to maintain safe road conditions. Repair any damage to roadway surfaces and rights-of-way.

6.1.1.5 Pollution and Waste Controls

The primary pollutant source for the project is disturbed soil within the construction site area which is discussed under Erosion Controls (see Section 6.1.1.1). Additional possible pollutants within the construction site area are:

- Vehicle fluids such as gasoline, oil, transmission fluid, grease, antifreeze
- Trash/Construction debris/other waste
- Portable toilet fluids

Control and BMPs related to potential pollutants on site are discussed below:

VEHICLE INSPECTION AND REFUELING OPERATIONS

The Contractor should inspect and maintain equipment to prevent unnecessary maintenance activities within WOUS, including wetlands.

The Contractor will assure that all equipment refueled and lubricated within the construction staging area will be at least 100 feet away from all waterbodies and wetlands.

WASTE DISPOSAL

The Contractor will be responsible for removing waste from the site, including proper disposal. Methods and locations for the regular collection, containment, and disposal of excess construction materials and debris (e.g., timber, slash, mats, garbage, drill cuttings and fluids, excess rock) should be determined throughout the construction process. Disposal of materials for beneficial reuse must not result in adverse environmental impacts and is subject to compliance with all applicable survey, landowner, or land management agency approvals and permit requirements.

Construction equipment will be rinsed out as needed on-site. The rinse sites will provide for soil infiltration of rinse water, and no detergents will be used. Sediment barriers will be used as needed to prevent water from wash sites from becoming a potential pollutant source in storm water discharge. Captured sediment from the wash sites will be properly disposed of. Trash will be collected at the end of each day and disposed of off-site.

SPILL CONTROL

Prior to construction and operation, a Spill Prevention, Control, and Countermeasures (SPCC) Plan and Emergency Response Plan detailing emergency procedures for addressing accidental releases and spills during construction and releases will be prepared and implemented to prevent spills, leaks, and other releases of hazardous materials that could impact onshore water quality. A SWPPP will also be approved to minimize impacts on surface waters. All work will be conducted in accordance with a Texas Pollutant Discharge Elimination System TPDES General Permit No. TXR150000 for stormwater and TPDES General Permit No. TXR050000 for industrial waste water meeting all provisions within the respective permit.

If the spill is less than 25 gallons to land or less than a sheen on water and the Contractor's crew can safely handle it, the crew will use construction equipment to containerize all spill material, contaminated soil, and absorbent material in a manner consistent with the spilled material's characterization.

If the spill exceeds a reportable quantity and/or cannot be adequately excavated and disposed of by the Contractor's crew alone, the Contractor will immediately notify the Operator.

MATERIAL STORAGE

Construction chemicals and materials, and stockpiles of dirt and topsoil will be stored in designated storage areas in a manner that prevents these materials from becoming a potential pollutant source in storm water discharge.

Stockpiled soils will be protected with sediment control fencing and/or stabilized with temporary vegetation or mulching. Construction materials and construction chemicals will be stored off of the ground surface (i.e., on pallets) and under protective cover. In addition, construction chemicals will be stored in the original manufacturer's containers.

6.1.1.6 Wildlife Species Impact Management

In accordance with the Migratory Bird Treaty Act of 1918 (MBAT), vegetation clearing and grading would occur during non-breeding season for most avian species, (i.e., October-February) so that impacts on breeding birds would be avoided or kept to a minimum. Additionally, areas deemed as potential breeding habitat for protected species (i.e. migratory birds and sea turtles) will be identified and flagged as sensitive areas.

6.1.1.7 Waters of the U.S. Impact Management

Impacts to waters of the U.S., including wetlands (WOUS), for the proposed project have been minimized by paralleling existing pipeline ROW and minimizing temporary workspace and ATWS to the maximum extent practicable. As per USCG and the United States Environmental Protection Agency (USEPA) regulations, an Emergency Response Plan will be developed for the Project.

All Project-related activities during construction, operation and decommissioning would comply with federal regulations to control the discharge of operational wastes such as discharges associated with hydrostatic testing,

trash and debris, and sanitary and domestic waste that would be generated from construction activities associated with the Project. BMPs, such as silt fencing and timber mats, will be utilized for construction activities in saturated soils to further minimize impacts to these sensitive areas. Additionally, in wetland areas, the Applicant will segregate topsoil and spoil material along the trench line to prevent mixing of the soil layers and to maintain available seed sources to facilitate quick revegetation of the construction work area. Per Nationwide Permit (NWP) 12 Regional Conditions, a 50-foot gap will be maintained for every 500 linear feet of sidecast material and no fill will be placed in a manner that would impede natural watercourses. Lastly, the Applicant will restore disturbed areas to pre-construction contours and elevations.

During pipeline installation of the inshore project components, within the Redfish Bay, mitigation measures will be taken to reduce the turbidity levels caused by trenching as required by issued permits. Barges will be used to hold sediment from trenches to reduce the dispersion of removed sediment in the shallow estuarine waterbody. Silt curtains may be deployed in the immediate work area to reduce the migration of sediment in the water column caused by disturbance during trenching or pipe laying.

6.1.1.8 Cultural Resources Impact Management

Known cultural resources or potential cultural resources are to be avoided. If avoidance of known cultural resources or potential cultural resources is not possible, additional investigations and a treatment plan will be developed in consultation with the Texas Historical Commission (THC) and applicable federal agencies.

An Unanticipated Discoveries Plan will be developed and implemented. This plan will be reviewed by the THC and applicable federal agencies. All proposed Project construction, operation, and decommissioning personnel shall be familiar with the plan and the steps that the Project has agreed to follow in the event of the discovery of significant cultural resources including human remains.

Access and maintenance of the Project will be completed through corridors which avoid cultural resources.

If previously unidentified cultural resources or historic properties are discovered during Project construction or restoration activities, any Project personnel that detect the discovery must immediately stop Project construction or restoration activities at the site of discovery and all Project ground-disturbing activity within a 50-meter radius of the discovery (this area is herein referred to as the exclusion zone). Access to the exclusion zone must me limited immediately. The construction contractor will then notify a designated representative of the discovery. Following notification of the discovery, the designated representative will immediately inspect the work site and determine the extent of the affected archaeological resource as defined by the THC or by the THC in consultation with the archaeologist retained by the applicant.

Notification procedures regarding unanticipated discoveries to all interested parties, including the lead federal agency and the Texas Historical Commission will be implemented. Interim treatment measures to protect the discovery from weather, looting and vandalism, or other exposure to damages will be applied.

In the event that shipwreck remains, or other potentially historic or archaeological materials, are discovered anywhere during the construction of the offshore portion of the Project, work should be halted immediately, and steps taken to ensure that the site is not disturbed. In state waters less than 3 nautical miles offshore, work must be halted within 50 meters (164 ft) of the find. In state waters greater than 3 nautical miles offshore, work must be halted within 150 meters (492 ft) of the find. Texas Gulf Terminals, Inc. will notify the State Marine Archaeologist at the THC immediately for further direction concerning the discovery. In federal waters, work must cease within 305 meters (1,000 ft) of the find. Texas Gulf Terminals, Inc. will contact BOEM's Regional Supervisor of Leasing and Environment within 48 hours of the discovery for further instructions concerning the find.

6.2 Horizontal Directional Drill Activities

Installation of the proposed pipeline via HDD crossing techniques will use the trenchless installation method selected at ten (10) designated areas of the Project. The following BMPs will be implemented at each HDD construction area to minimize impacts to the environment. Refer to Attachment 1 for a depiction of the HDD locations and associated construction workspaces.

6.2.1 Horizontal Directional Drill BMPs

All applicable BMPs previously described in Section 6.1 will also be implemented for HDD activities including:

- Erosion Control;
- Pollution and Waste Controls;
- Wildlife Species Impact Management;
- WOUS Impact Management; and,
- Cultural Resources Impact Management.

6.2.1.1 Construction Notification

Prior to access or construction activities associated with HDD crossings, all necessary approvals, permits, and/or notifications will be received, or issued, respectively. All conditions specified in approvals or permits will be discussed, understood, and adhered to during the HDD installation process. Any notification requirements detailed in the permits/approvals will be provided within the timing specified. All notifications will be completed, documented and maintained.

6.2.1.2 Construction Area Demarcation and Restriction

The HDD entry and exit locations will be sited to provide a minimum setback from sensitive resources and a maximum design depth clearance to provide the greatest buffer between the sensitive resource and the drilling activity/installed pipe.

All buffer zones or restricted areas will be identified and flagged prior to mobilization and site preparation. In addition, any restricted areas identified by permits/approvals will be flagged. Access to these restricted areas will be prohibited unless authorized by the appropriate regulatory authority in the case of permits/approvals. A restricted area around any operations equipment during HDD installation is anticipated within Laguna Madre or GOM waters.

6.2.1.3 Site Preparation

A pre-construction survey will be conducted to confirm the HDD entry and exit points (within HDD Boxes) for the pilot bore as shown on the construction drawings. All HDD entry and exit points will be clearly staked or marked in the field. A survey examination of entry and exit points will be done prior to casing and equipment installation to verify distances, field stations, and elevations along the proposed pipeline centerlines. Points will be plotted for the monitoring and recording of the three-dimensional coordinates generated by the magnetic guidance tracking software. This exercise ensures the pre-alignment and radius restrictions are maintainable during the execution of the HDD. Following receipt of the survey results a comparison against the engineering design profile will be conducted and verified prior to starting drilling operations.

The HDD rig layout and site setup may vary based on the provided work space. During site preparations the size, slope grade, berm walls, and ingress and egress will be defined. The HDD equipment preferred footprint is of a level grade to ensure safe and efficient drilling operation. HDD rig matting will be placed on entry to ensure a safe and effective working environment. All matting used during HDD installation would be removed upon completion.

Entry or exit casings will be installed in the event it is required at an HDD crossing. Casing will be installed according to the geo-technical information and profile design. Casing will be cleaned by the casing contractor prior to use. Casing final design will be based on actual geo-technical information.

6.2.1.4 Inadvertent Return Contingency Plan

The most likely occurrence of inadvertent mud releases developing during drilling operations is from Inadvertent Returns. An Inadvertent Return is a condition in which the drilling mud is released through fractures in the soil and migrates toward the surface. Inadvertent Returns usually occur when the downhole pressures are too high and overcome the restraining forces of the surrounding formation. This most often occurs during the pilot hole drilling operations when the pressures are the highest. Escape of drilling mud from an Inadvertent Return is most common near the drill entry and exit locations but can occur at any location along the drill path. An Inadvertent Return Contingency Plan has been prepared for the proposed Project which identifies operational procedures and responsibilities for the prevention, containment, and clean-up for the unplanned release of drilling fluids associated with HDD operations for the Project.

Upon detection of an inadvertent release of drilling fluid (bentonite) occur, all drilling activities will cease, containment and subsequent clean-up will begin immediately. Field measures to contain inadvertent releases of drilling fluid will vary according to site-specific conditions (e.g. volume of fluid, topography, and environmental setting). The most commonly utilized system for containment of surface releases of bentonite would involve a perimeter earthen berm, hay bales, or silt fence. Where this system of containment cannot be employed, containment procedures will be directed by the Company inspector(s) to minimize environmental impact. After containment, clean-up and restoration will generally be accomplished utilizing one of the following: hand labor, hand tools and buckets; portable pumps and hand tools; rubber-tired equipment and hand tools; and/or vacuum trucks and hand tools. In the unlikely event that a drilling fluid release occurs within an area that cannot be isolated or contained, such as along the bed of the waterbody or into the water, drilling operations will be stopped immediately. Upon evaluation by appropriate personnel, a decision will be made on how best to continue the crossing construction to minimize impacts. Project team will ensure that all reasonable measures within the limitations of the technology have been taken to re-establish drilling fluid circulation; continue drilling with the minimum amount of drilling fluid required to penetrate the formation and successfully install the pipeline. In the event of an inadvertent release of drilling fluid within a waterway, Applicant will immediately notify the appropriate agencies detailing the location and nature of the release, the corrective actions being taken, and whether the release poses a threat to public health and safety.

6.2.1.5 Cleanup & Restoration

Following the completion of the HDD, the temporary workspaces will be cleaned up and restored to original contours and vegetated conditions.

6.3 Harbor Island Booster Station Installation

Construction of the Harbor Island Booster Station would start with site preparation to establish the conditions necessary for the construction and installation of the proposed infrastructure. The construction and installation of the Harbor Island Booster Station will be completed using current industry standard practices. The Harbor Island Booster Station will be constructed within an approximate 19-acre site located on Harbor Island in Nueces County, Texas.

Refer to Attachment 1 for a depiction of the Booster Station location and associated construction workspace area.

6.3.1 Harbor Island Booster Station BMP

All applicable BMPs previously described in Section 6.1 will also be implemented for Harbor Island Booster Station construction including:

- Erosion Control;
- Pollution and Waste Controls;
- Wildlife Species Impact Management;
- WOUS Impact Management; and,

- Cultural Resources Impact Management.

6.3.1.1 Site Preparation

A pre-construction survey will be conducted to confirm the site location as shown on the construction drawings. All clearing, grading, and site elevation will be conducted according to construction permits and following Erosion Control BMPs. Following receipt of final survey results a comparison against the engineering design will be conducted and verified prior to starting Booster Station installation.

6.3.1.2 Construction Contractor Entrance/Exit

Construction materials will be delivered to the construction site via existing access roads to minimize disturbance to areas outside the designated ATWS and 19-acre site. All construction contractors and equipment, as well as transport vehicles delivering industrial components of the Booster Station, will enter and exit the site at a controlled entrance. The controlled entrance and exit location will include security for site as well as a stabilized construction entrance as described in 8.2.1. The construction entrances/exits and staging areas will be cleaned regularly to keep them clear of debris and materials. A stabilized construction entrance will be utilized to minimize off-site vehicle tracking. Dust suppression activities such as watering exposed soils and traffic management, will be employed to reduce nuisance conditions.

6.4 Offshore Pipeline Installation

The offshore pipeline will be installed with a jetting technique in a 75-ft wide construction workspace on the sea floor. To begin offshore pipeline installation, a pipelay barge will begin at the eastern end of HDD 10, in the Gulf of Mexico. The pipelay barge will then set four anchors along the pipeline ROW, two of which anchors will be from the stern (port stern and starboard stern) and two from the bow (port bow and starboard bow). The anchors set from the bow will be set and tensioned in front of the pipelay barge. When the anchors are set, a material transport barge loaded with line pipe will be towed from the nearby port and brought alongside the pipelay barge. The material transport barge will be secured with ropes to either the port or starboard side of the pipelay barge. Once positioning is confirmed, the pipelay barge will use the abandon and recovery (A&R) winch to retrieve the tail sections of HDD 10 from the sea floor and will then guide the pipeline through the pipe alley and onboard the vessel. The pipelay barge bow will be facing eastward. A stinger will not be required for this portion of pipelaying due to the shallow water and proximity to shore. The laydown head that was installed on the HDD 10 tail section will be removed, and the pipelay barge will commence to assemble the offshore pipeline.

During the assembly of each new joint of pipe, the pipelay barge will move forward by tightening the bow anchor cables and slacking the stern anchor cables. Given that the pipe is connected to the end of HDD 10, the pipeline will begin to leave the stern of the pipelay barge and settle on the ocean floor. This process will repeat until the total length of pipeline has been installed on the seafloor. When the last joint of pipe has been welded and inspected, it will be lowered to the seafloor using the A&R winch on the pipelay barge. This process will be performed once for each of the proposed offshore pipelines.

6.4.1 Offshore Pipeline BMPs

6.4.1.1 Survey

All necessary charts, nautical aids, navigational warnings, and signs required to properly conduct the installation of the pipelines will be identified and made available prior to the commencement of construction activities. There shall be onboard, the required survey personnel and remotely operated vehicle (ROV), for continuous 24-hour per day positioning of each installation vessel. The positioning system shall utilize a satellite-based system that maintains a plus-or-minus five (5) meter accuracy.

6.4.1.2 Water Quality

Water quality impacts should be minimized by using the best available technology while constructing and operating the DWP to the fullest intent possible. All Project-related activities during construction, operation and decommissioning would comply with federal regulations to control the discharge of operational wastes such as bilge and ballast waters, trash and debris, and sanitary and domestic waste that would be generated from vessels associated with the Project. Discharges associated with hydrostatic testing of pipelines during construction are to be in accordance with the issue NPDES hydrostatic test water discharge permit.

Construction and support vessels under the purview of the Applicant will be required to Notices to Lessees No. 2015-BSEE-G03, Marine Trash and Debris Awareness and Elimination, which will minimize the potential for lost debris to degrade in sensitive areas.

6.4.1.3 Navigation Safety

Risks due to other marine traffic in the area, considered low in likelihood, will be mitigated through establishing a safety zone around any vessel operating in the construction or installation of the offshore components.

During Project installation/commissioning, the applicant will communicate with the USCG and USACE Navigation Branch, and federal pilots regarding offshore Project installation activities. Prior to commencing installation, the applicant will communicate with the appropriate USCG personnel to ensure a Notice to Mariners is issued prior to any installation activity. The Notice to Mariners would alert vessel captains ahead of time about the location of the Project's temporary installation activities and the exact coordinates of restricted-access temporary safety zones around each installation site. Working vessels could also issue very high frequency (VHF) radio broadcasts, as needed, to alert passing vessels about the presence of temporary safety zones around each site of active installation. The temporary safety zones, themselves, would be mitigation measures to temporarily segregate marine uses in the area and prevent collisions, accidents, or other undesired interactions between Project installation activities and non-Project commercial or recreational vessel transits.

To mitigate potential impacts from temporary safety zone and Project-related vessels on all marine uses during installation/commissioning, the Applicant would:

- Issue Notice to Mariners;
- Communicate with the USCG, the USACE Navigation Branch, and state and federal pilots regarding offshore Project installation activities; and
- Ensure that working vessels would issue very high frequency (VHF) radio broadcasts, as needed.

To mitigate potential impacts from temporary safety zone and Project-related vessels on aesthetics and viewshed during installation/commissioning, the Applicant would:

- Select a site within an offshore location that are not visible to land-based viewers; and
- Utilize temporary safety zones of approximately 1,640 feet (500 meters) around sites would limit close views of installation vessels and activities.

To mitigate potential impacts from safety zone and Project related vessels on all marine uses except marine shipping and commercial ports during routine operations, the Applicant would:

- Select a site in a location with limited oil and gas activity;
- Selection a site in a location that does not have unique fishing or recreational properties compared with adjacent areas of the GOM; and
- Select a site in a location that does not have known significant sediment resources.

To mitigate potential impacts from safety zone and Project-related vessels on Marine Shipping and Commercial Ports during routine operations, the Applicant would:

- Work with USCG, widely distribute coordinates of each safety zone to marine communities prior to operation and add to nautical charts prior to its effective date;
- Position the DWP to permit transits between safety zones (approximately 1.0 nm minimum width between safety zones); and
- Avoid interference with traffic in safety fairways (at least 2.6 nm distance)

To mitigate potential impacts from temporary safety zone and Project-related vessels on aesthetics and viewshed during routine operations, the Applicant would:

- Select a site in offshore location that is not visible to land-based viewers;
- Ensure that equipment on board the DWP is painted a neutral color to blend with sky backdrop;
- Utilize safety zones of approximately 0.49 nm radii that would limit close views of the DWP.

6.5 SPM Buoy System Installation

The SPM buoys are a predesigned system that is fabricated entirely offsite within a controlled environment. It consists of the buoy hull, rotating table, swivels, hoses, chains, anchoring, navigation aids, solar panels and other ancillary equipment as required for the specific use and size of the vessels that will be utilizing the SPM buoy systems. The onsite SPM buoy installation process begins with the arrival of its associated components to the designated location.

6.5.1 SPM Buoy System Installation BMPs

For the construction of the SPM buoy system, the Applicant would utilize land-based fabrication to minimize the timing and disturbance associated with offshore installation.

6.5.1.1 Site Preparation

The location of the anchor piles and chains will be surveyed for any obstruction and to confirm seafloor bathymetry prior to commencement of the pile driving.

6.5.1.2 Navigation Safety

Navigation safety measures discussed in Section 6.4.1 are also applicable to the SPM buoy installation phase.

6.5.1.3 Marine Mammal Protection

To minimize the potential for vessel strikes of marine mammals, BOEM NTL No. 2016-G01, Vessel Strike Avoidance and Injured/Dead Protected Species Reporting, will be followed by all Project construction and support vessels.

A Project-specific spill response plan will be developed prior to construction, which will identify measures to prevent, contain, and clean up any inadvertent spills from construction and support vessels.

6.5.1.4 Pile Driving Mitigation

The installation vessel will begin by installing the CALM anchor pilings. The anchor piles will be prefabricated and have the connections preinstalled on the upper portion of the anchor piles. It is anticipated that twelve anchor piles will be required per SPM buoy CALM system. The piles will be pneumatically driven in the locations as specified in the final construction drawings. The pile driving and refusal limits (if achieved) will be based on industry accepted standards. Each pile shall be orientated so that the anchor chain connection point is facing the correct direction. The piles will all be driven, and the chains will be connected and placed in a “Lazy S” on the seafloor.

To minimize the sound level impacts associated with pile-driving, mitigation measures are under development. While identification of mitigation is not final, measures may include:

- Use of the lowest energy hammer feasible for installation of the piles;
- The use of "soft starts," using a lower hammer energy level to begin pile-driving, which allows sensitive species to avoid the vicinity prior to peak pile-driving noise;
- The use of a bubble curtain or other sound damping system to minimize propagation of pile-driving noise

Use of sound damping systems to reduce impact on wildlife can include, but are not limited to the following:

- Hydro Sound Damper (HSD) – The HSD system consists of a fisher net where HSD elements with different sizes and distances from each other are mounted. With ballast ring on the seabed and a floating system on the sea surface, the fisher net, including the HSD elements, can be located in a short distance (< 1 meter) around the pile. The HSD elements can consist of foam plastic or gas-filled balloons. The radiated noise from the pile must cross the HSD elements and will be reduced due to reflection and absorption. In principal, the HSD elements act like air bubbles in the water with the advantage that they cannot be drifted by current and their size and, therefore, the resonance frequency is adjustable.
- Noise Mitigation Screen (NMS) – an NMS system consists of a double-wall steel screen (tube). The pile will be inserted into this system. The space between the two screens is filled with air; additionally, air bubbles can be feed-in between pile and NMS system (water-air-composite). The radiated sound crosses the internal bubble curtain as well as the air-filled double-wall steel screen and will be reduced due to reflection (impedance gap).
- Cofferdam – The cofferdam system consists of a single-wall steel tube. The pile will be inserted into this system. Near the seabed, a gasket (seal ring) is installed so that the space between pile and cofferdam can be evacuated from water by pumps. In principal, the pile can be installed "in air" and not in water so the pile radiates the sound into air and will cross the steel tube thereafter. Due to the different impedances the pile-driving noise will be reduced by reflection.

If required, passive acoustic monitoring (PAM) could be implemented for marine mammal and turtle observing prior to the start of pile driving.

8 BMP Maintenance and Inspections

Once the controls are in place, qualified inspection personnel will inspect, monitor, and report on all control structures installed by the Applicant. Additionally, the Applicant or the designated Contractor will provide continued maintenance of all erosion and sediment controls and other storm water-related methods.

This effort will include the following:

1. Routine inspections will be conducted every seven days for the project control structures until the project site is stabilized.
2. After each inspection, prepare an inspection report documenting the current status of observed control measures, including deficiencies or required modifications. An inspection report for each evaluation will be given to the Applicant and its Contractors. Copies will be forwarded to the Applicant and recorded in the project files, which are available for agency review.
3. All measures will be maintained in good working order; if a repair is necessary, it will be initiated by the Applicant within 24 hours of the report.
4. Built-up sediment will be removed (by the Applicant or designated contractor) from silt fences when it has reached one-third the height of the fence.
5. Silt fences will be inspected for depth of sediment and tears to see if the fabric is securely attached to the stakes, and to see that the stakes are firmly in the ground.
6. Hay bale structures will be inspected for proper anchoring, decay, and missing sections, and will be replaced by the Applicant if not properly working.
7. Permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.
8. Perform follow-up inspections after required changes to the control structures have been implemented in the field by the applicant and document these changes as "installed" on the appropriate alignment sheet(s).
9. Document instances of non-compliance and recommend compliance measures.
10. Maintain a project file for all pertinent record information including, but not limited to, inspections and plan changes. Project files will be organized in an orderly fashion to facilitate agency review (e.g., TCEQ).
11. Serve as the Applicant’s agent and attend any project inspection visits performed by government agencies. Assist the Applicant in answering questions submitted by agency review personnel.

9 References

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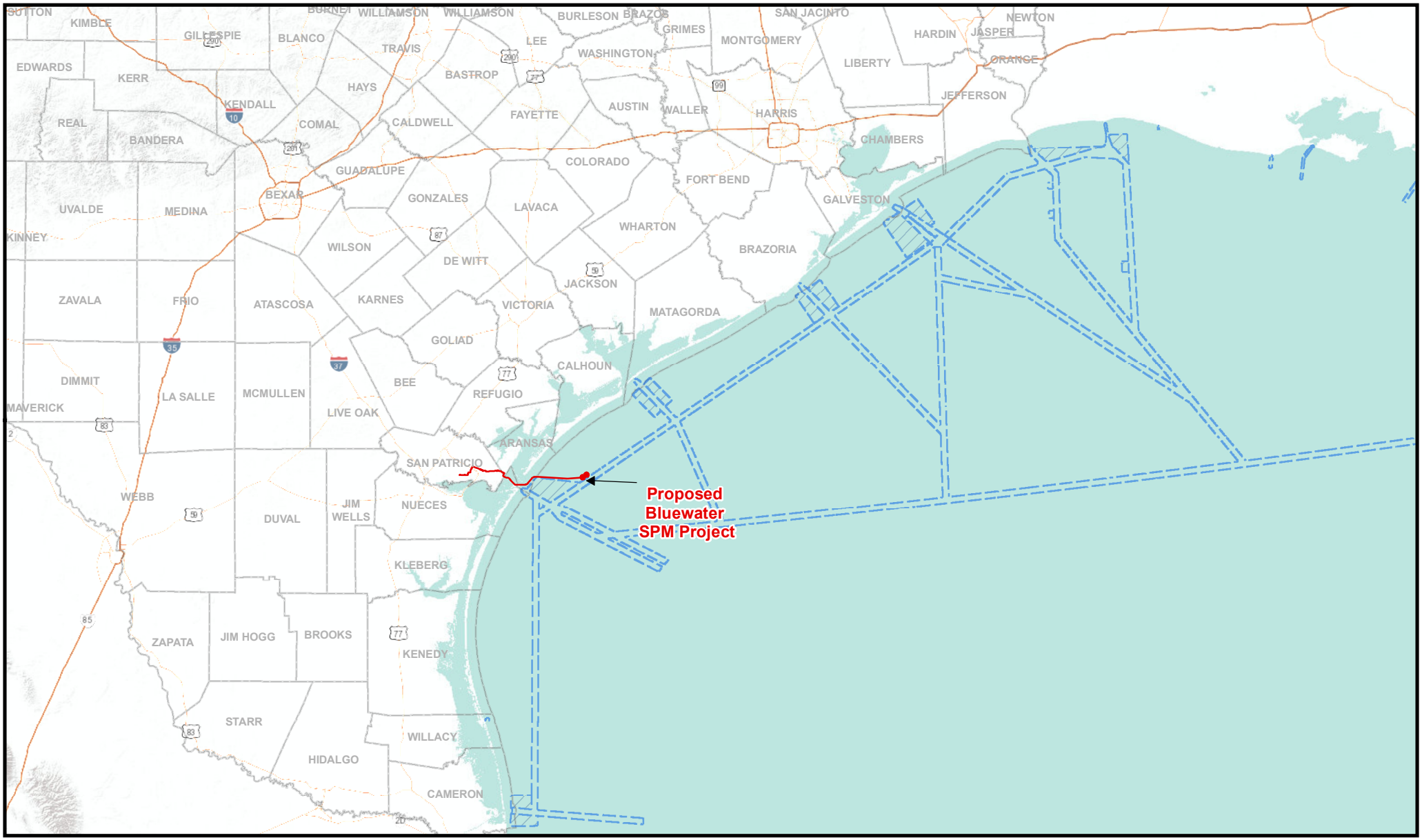
ATTACHMENT 1
PROJECT FIGURES AND CONSTRUCTION WORKSPACE MAPS



Map Details

- Proposed Project Components
- Navigational Fairways
- Anchorage Areas
- Counties

1 inch = 50 miles

0 25 50

Miles

N

W E

S

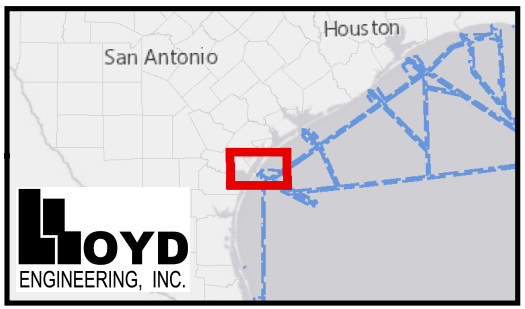
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 1
Proposed Project Vicinity Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019

LOYD ENGINEERING, INC.



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Map Details

- SPM Buoy
- Onhshore Pipelines
- Inshore Pipelines
- Offshore Pipelines
- Harbor Island Booster Station
- SPM Buoy ATBA and Safety Zones
- Navigational Fairways
- Navigation Channels
- Anchorage Areas

1 inch = 5 miles

0 2.5 5

Miles

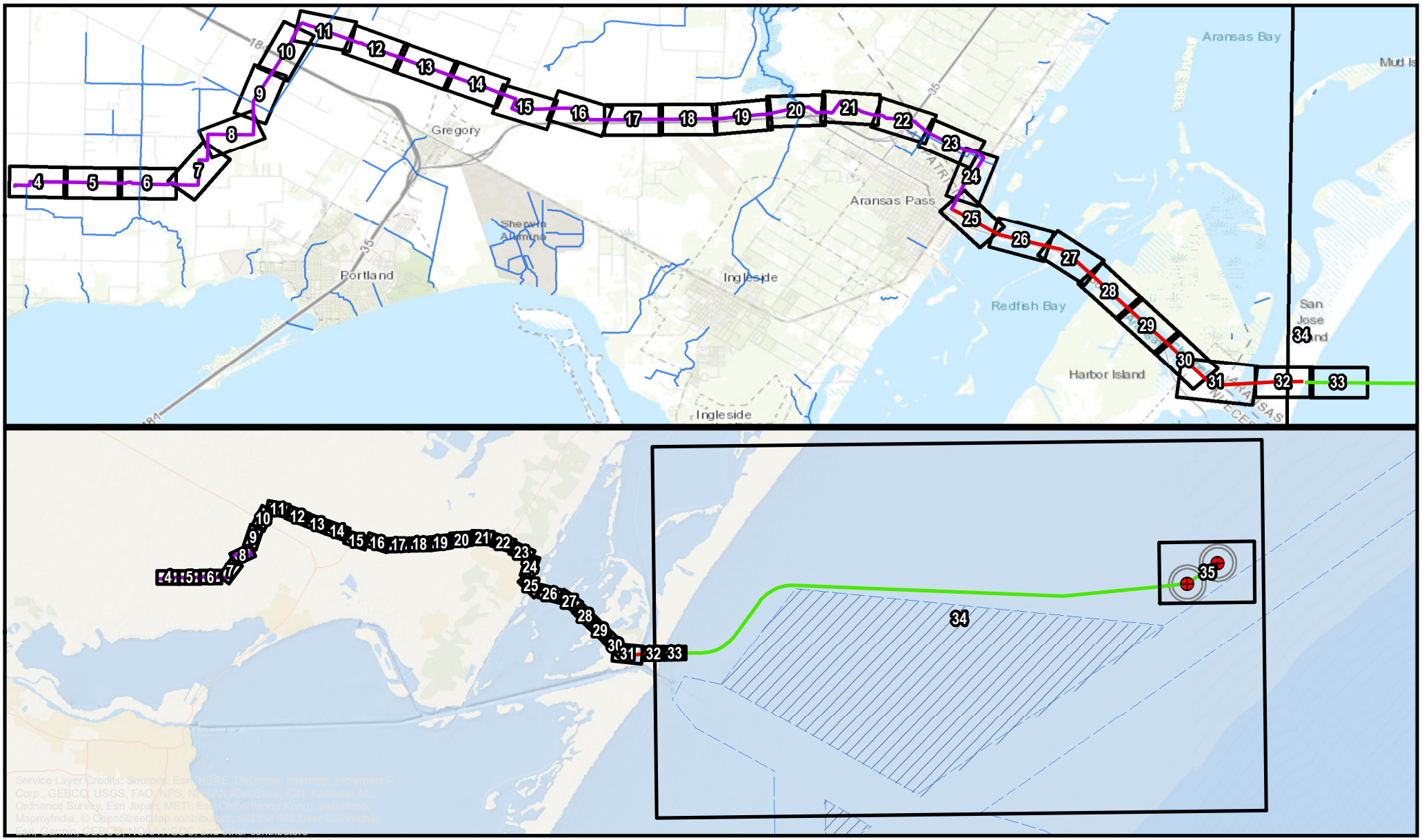
N W E S

Coordinate System: NAD 1983 201
StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 2
Proposed Project Component Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



LOYD ENGINEERING, INC.

Map Details

- Figure Index
- SPM Buoy System
- Onhshore Pipelines
- Inshore Pipelines
- Offshore Pipelines
- SPM Buoy ATBA and Safety Zones
- Navigational Fairways
- Anchorage Areas

1 inch = 6 miles

0 3 6

Miles

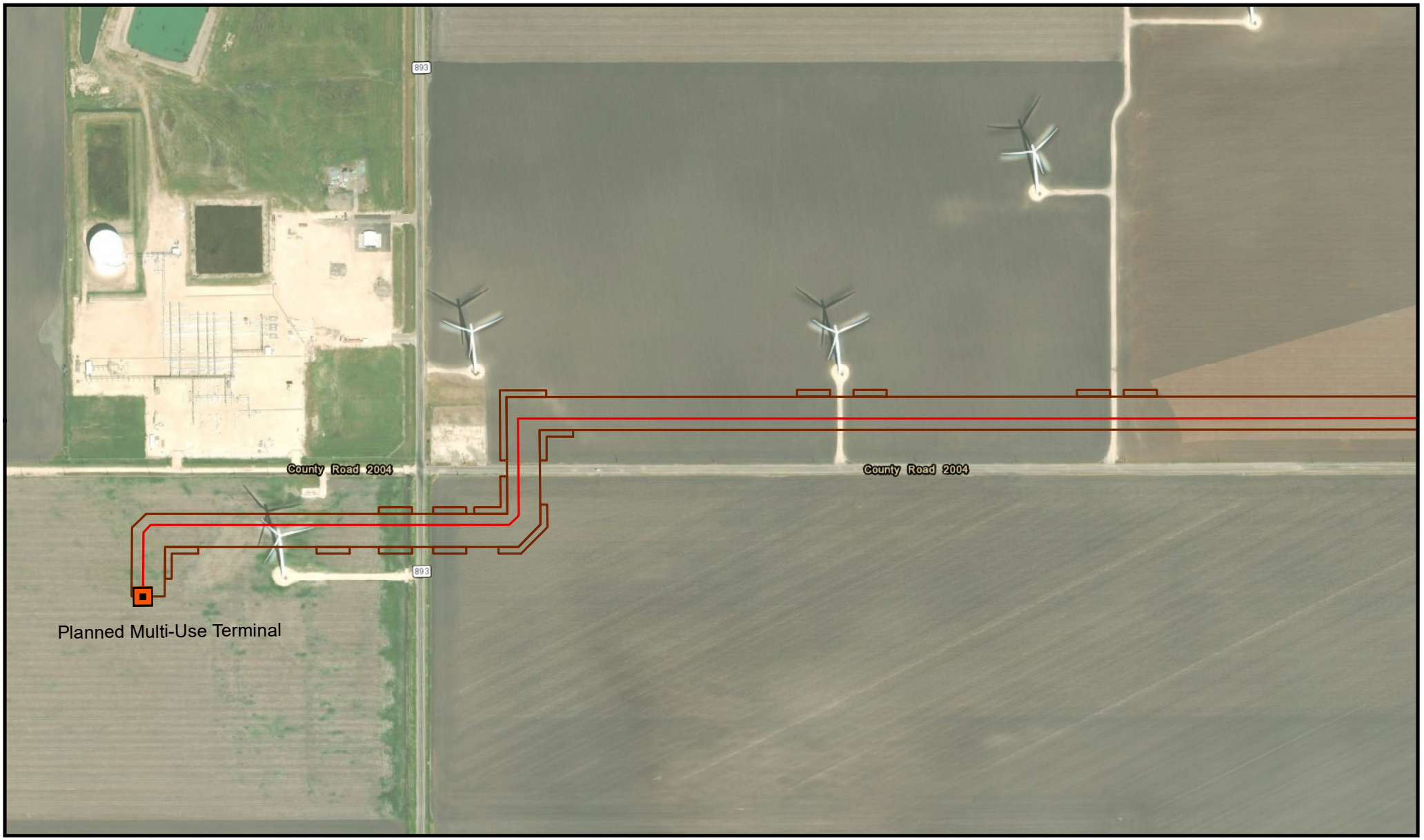
N W E S

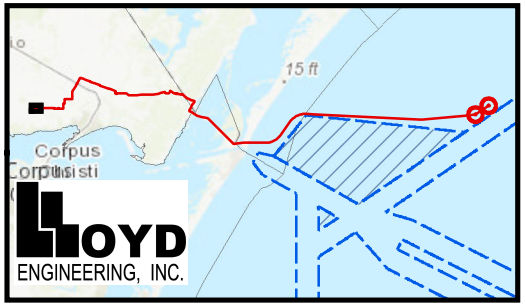
Coordinate System: NAD 1983 HARN StatePlane Texas South FIPS 4205 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983 HARN
Units: Foot US

Figure 3
Proposed Project Figure Index

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- Planned Multi-Use Terminal
- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

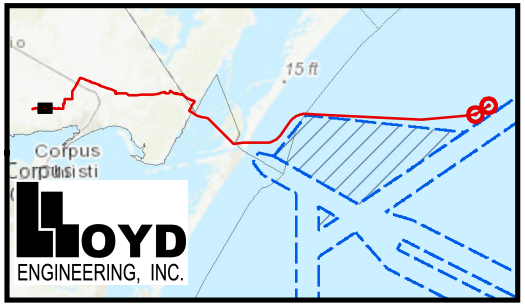
N W E S

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 4
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

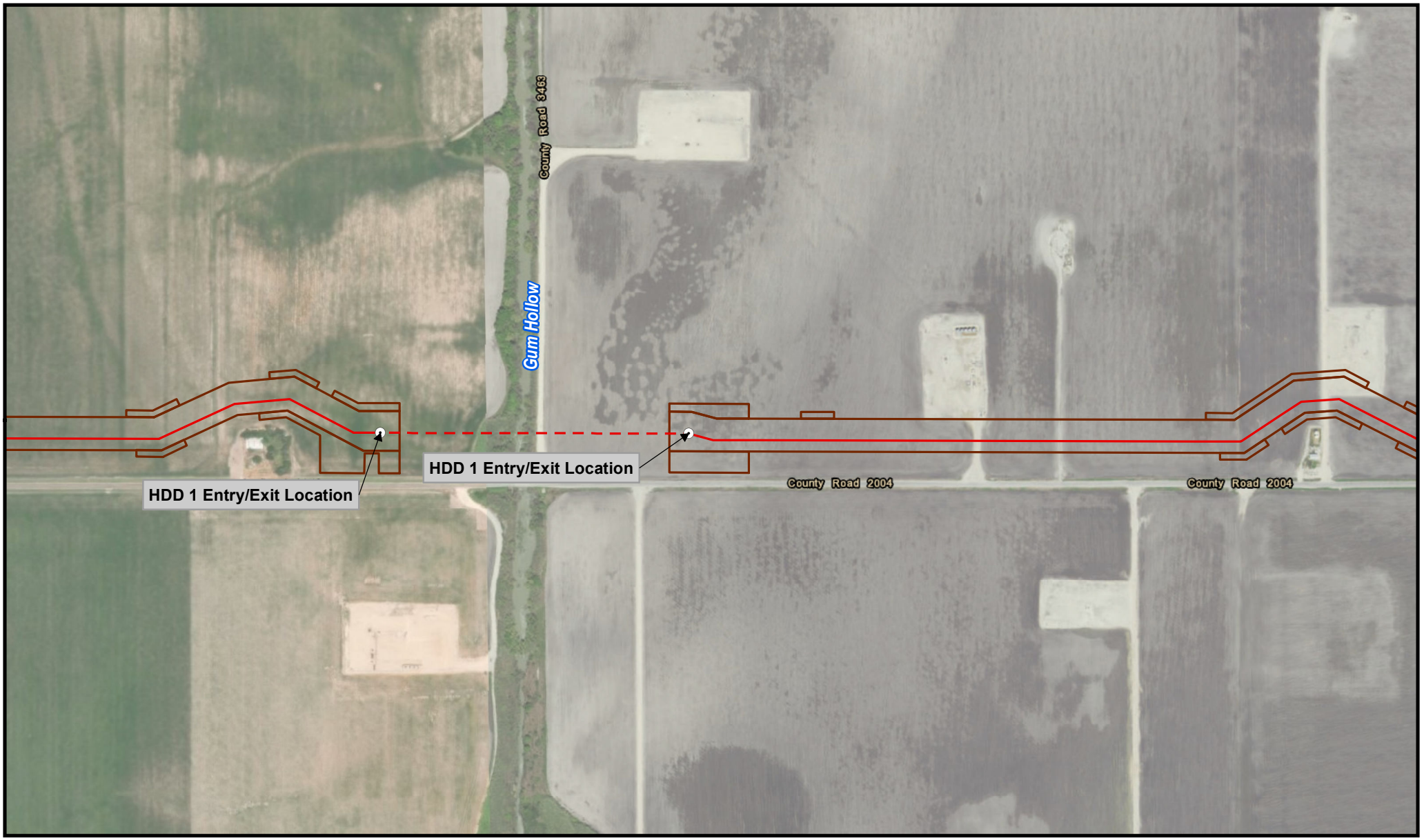
N
W E
S

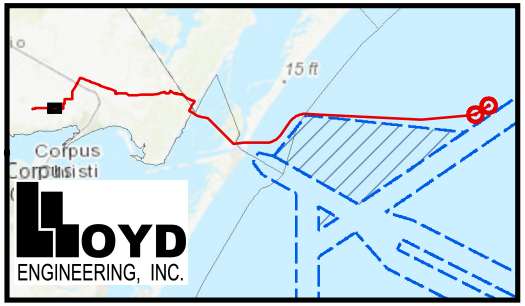
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 5
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

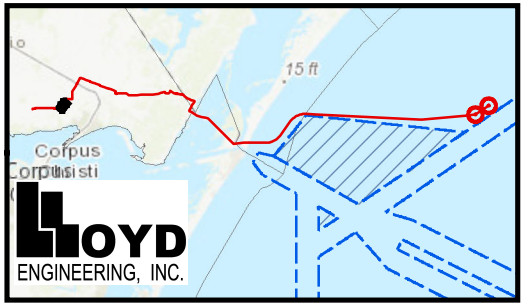
N W E S

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 6
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

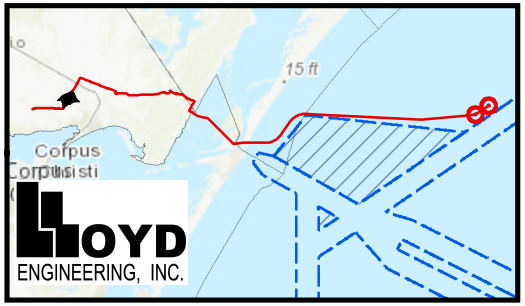
Feet

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 7
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

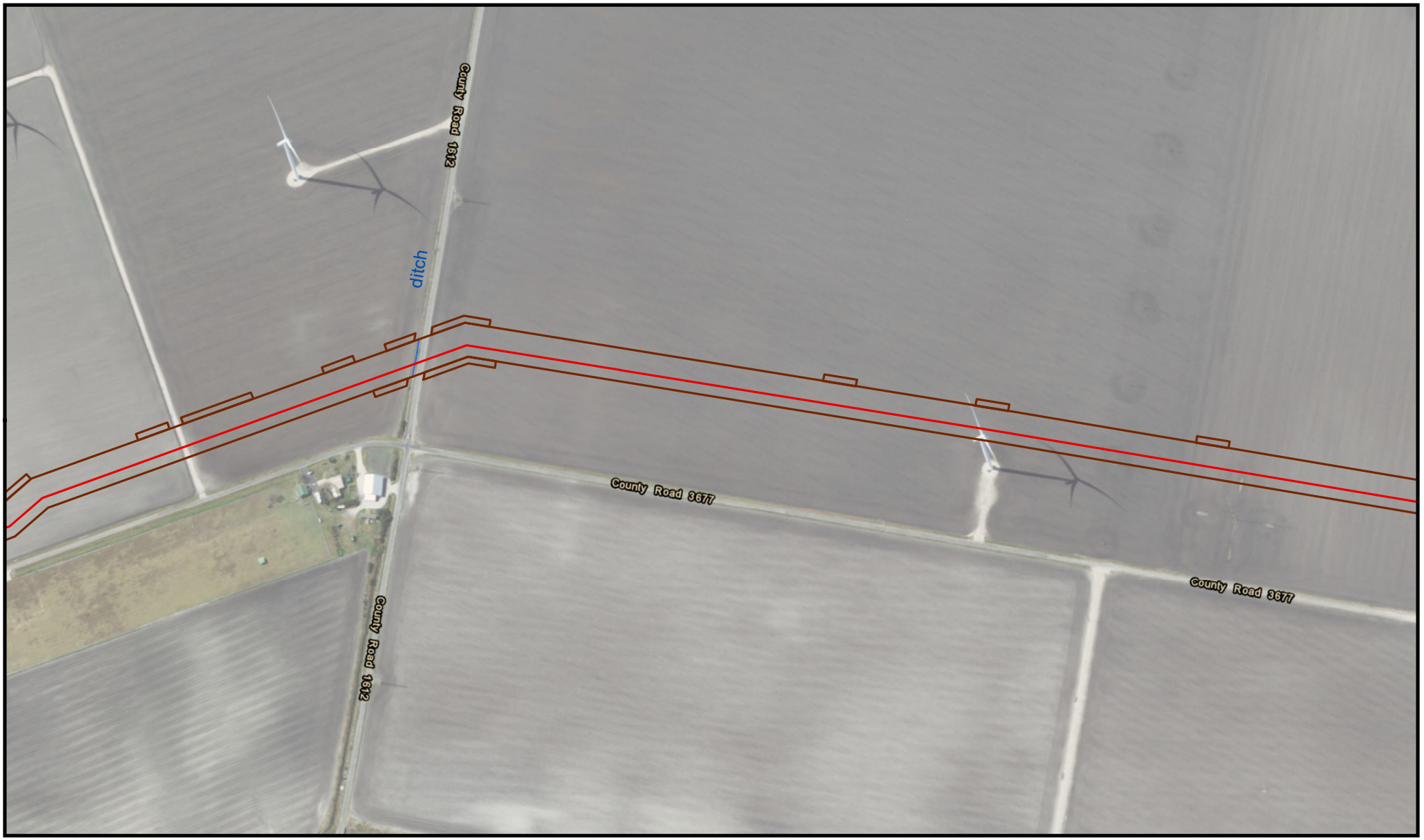
N W E S

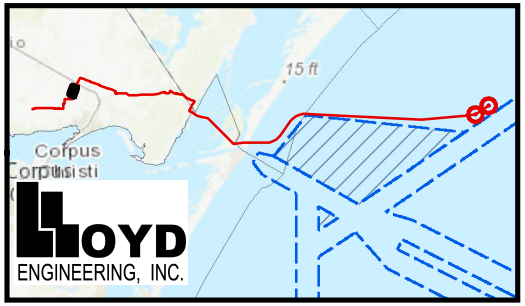
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 8
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

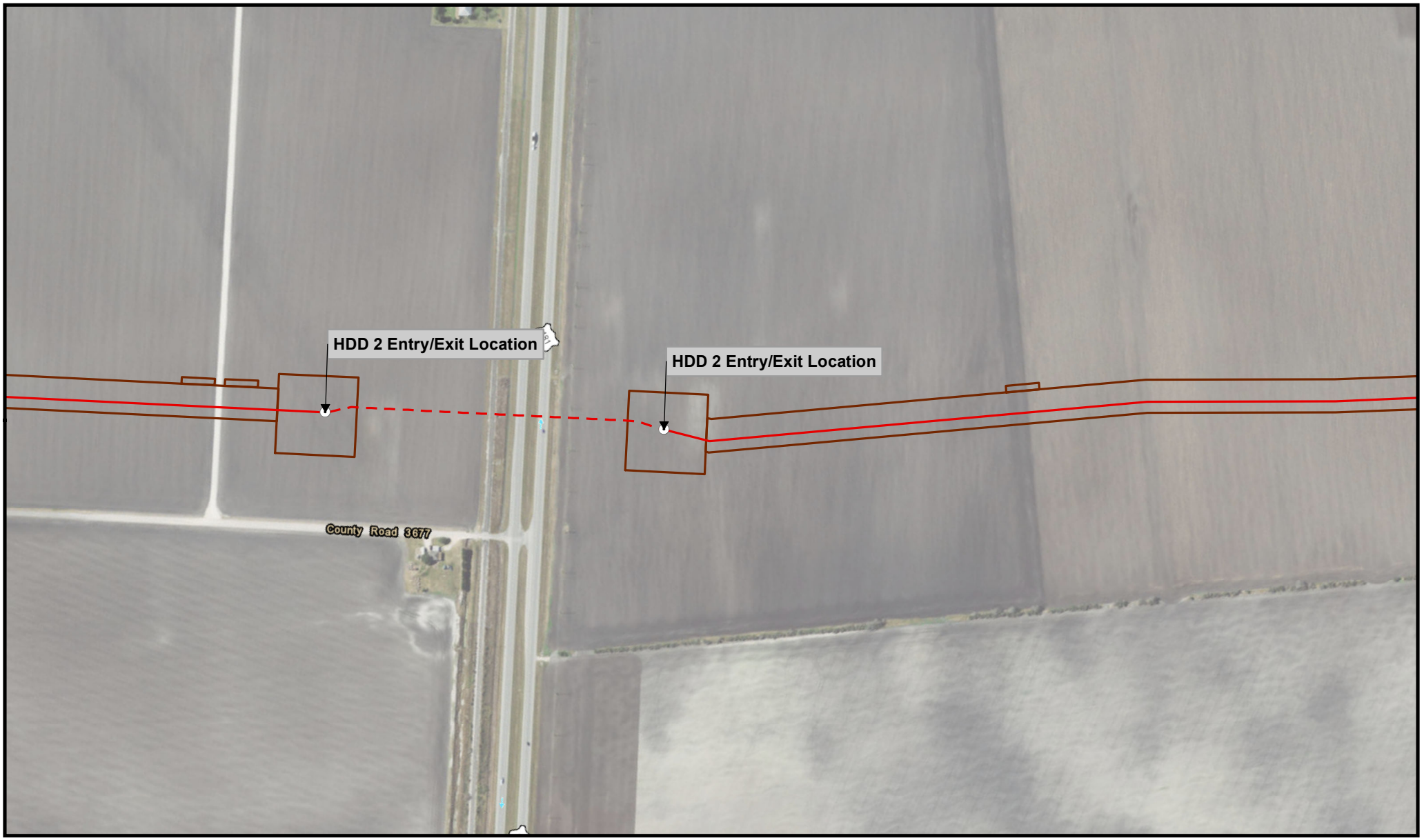
Feet

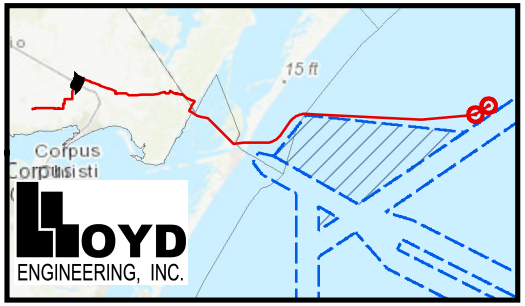
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 9
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

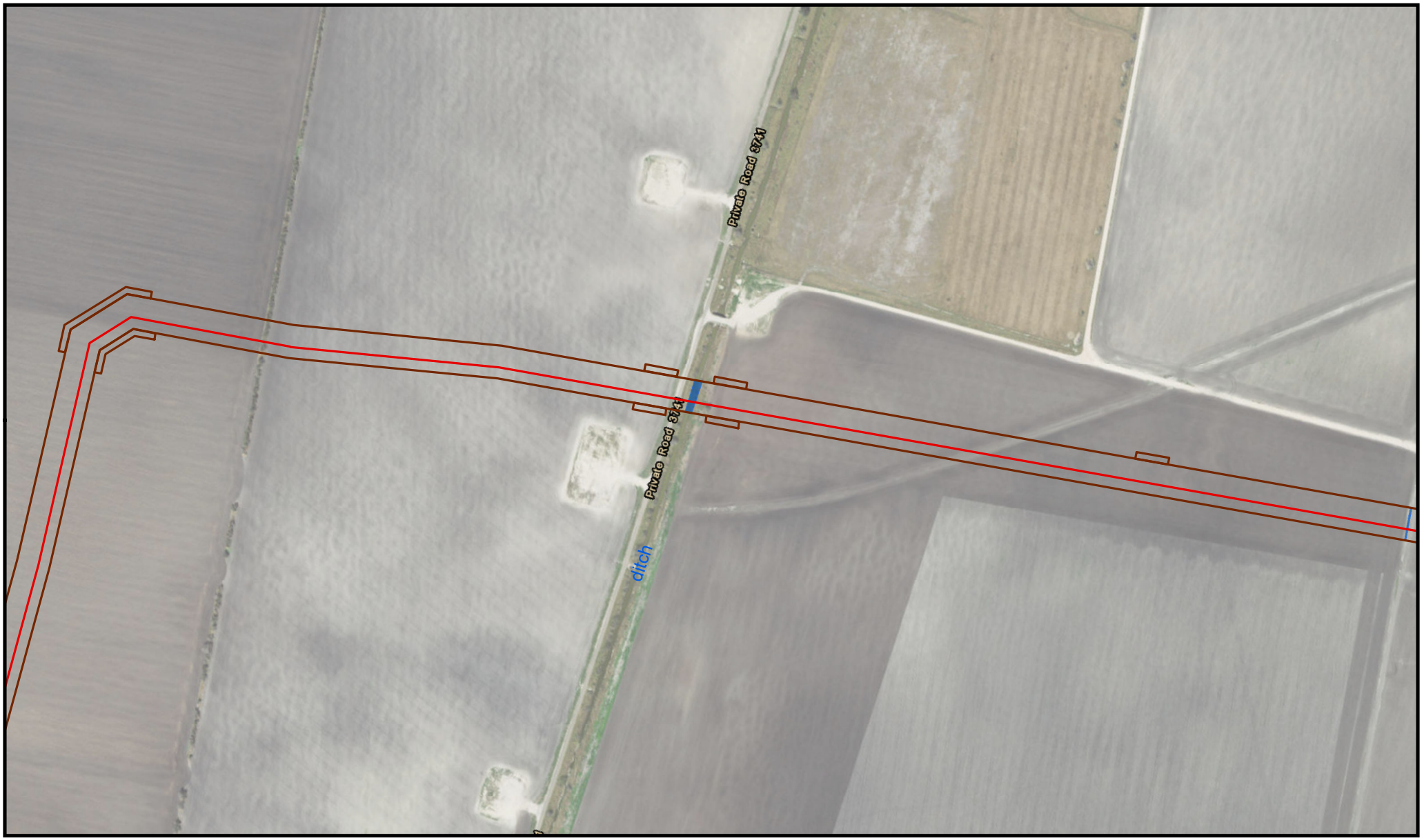
Feet

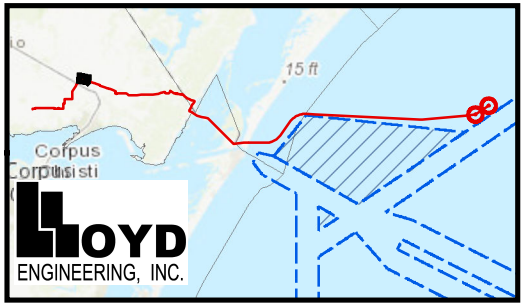
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 10
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

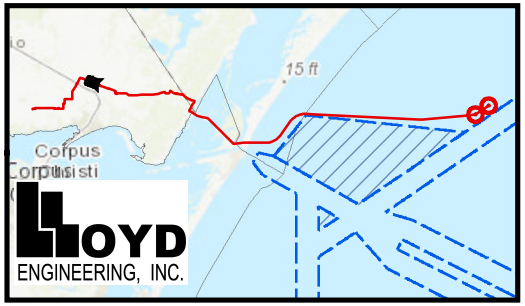
N E S W

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 11
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

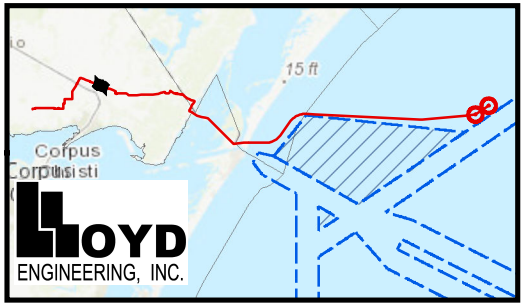
Feet

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 12
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

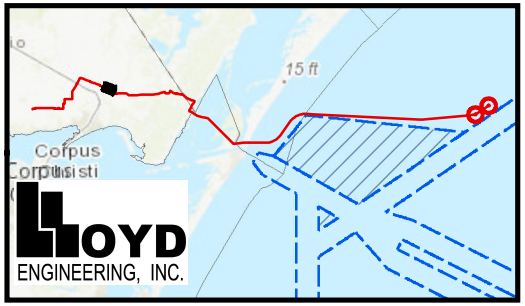
Feet

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 13
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

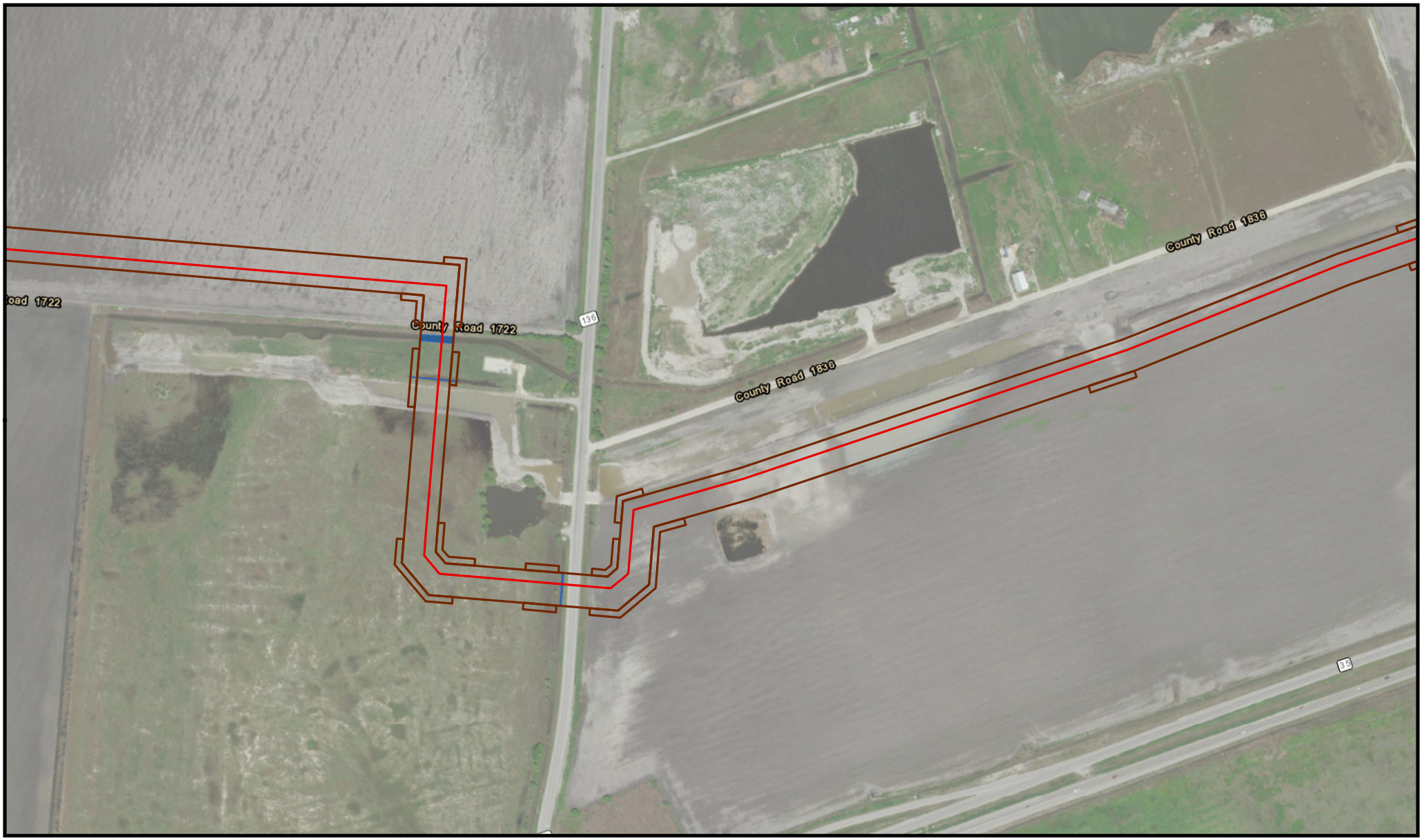
N E S W

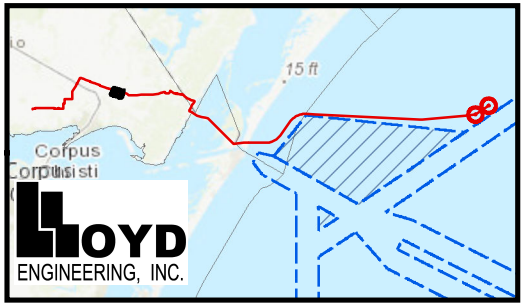
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 14
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

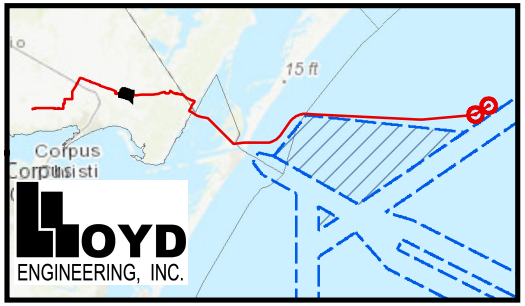
N E S W

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 15
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

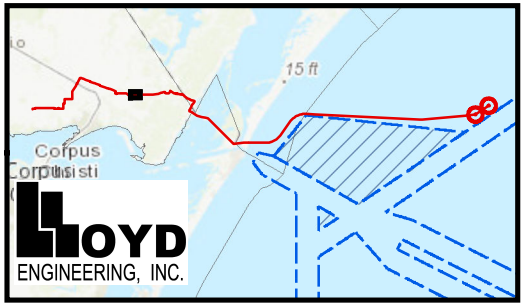
N E S W

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 16
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

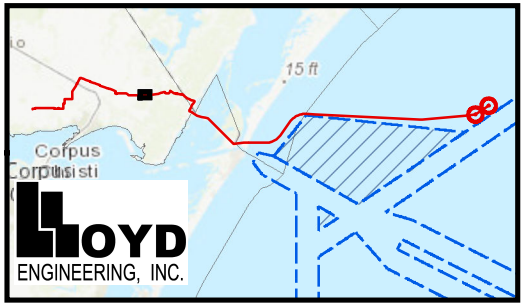
N
W E
S

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 17
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

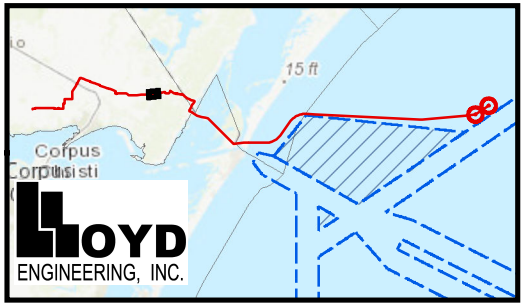
N W E S

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 18
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

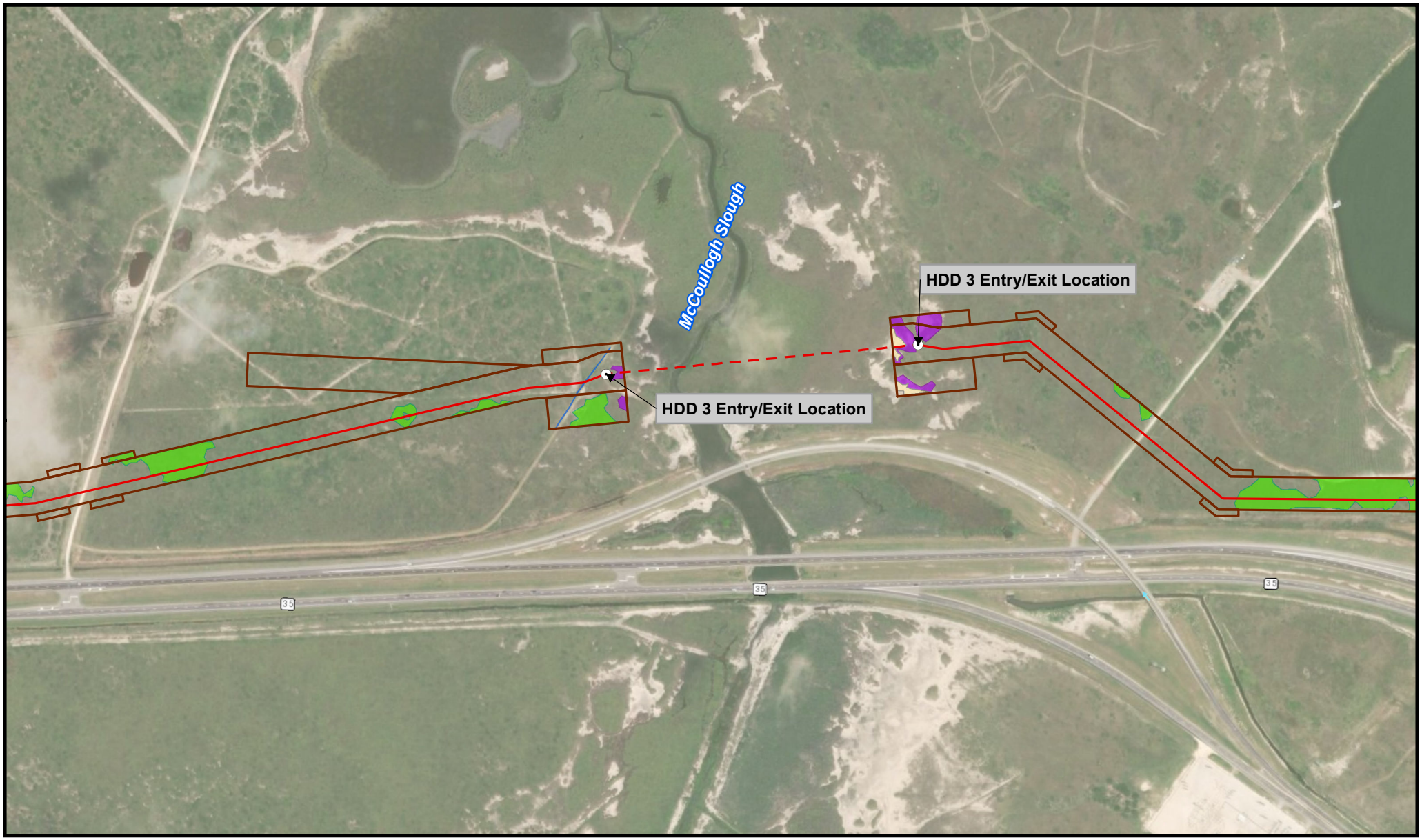
N
W E
S

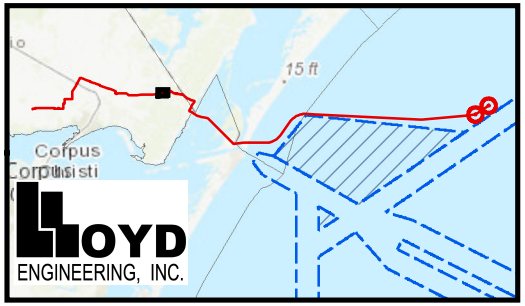
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 19
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

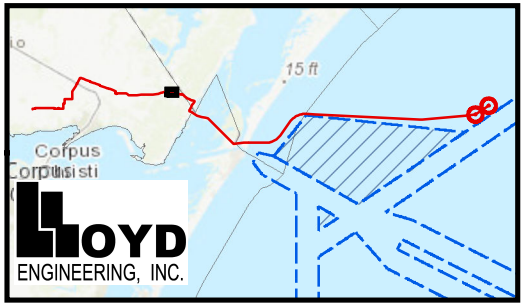
N W E S

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 20
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
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- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

Feet

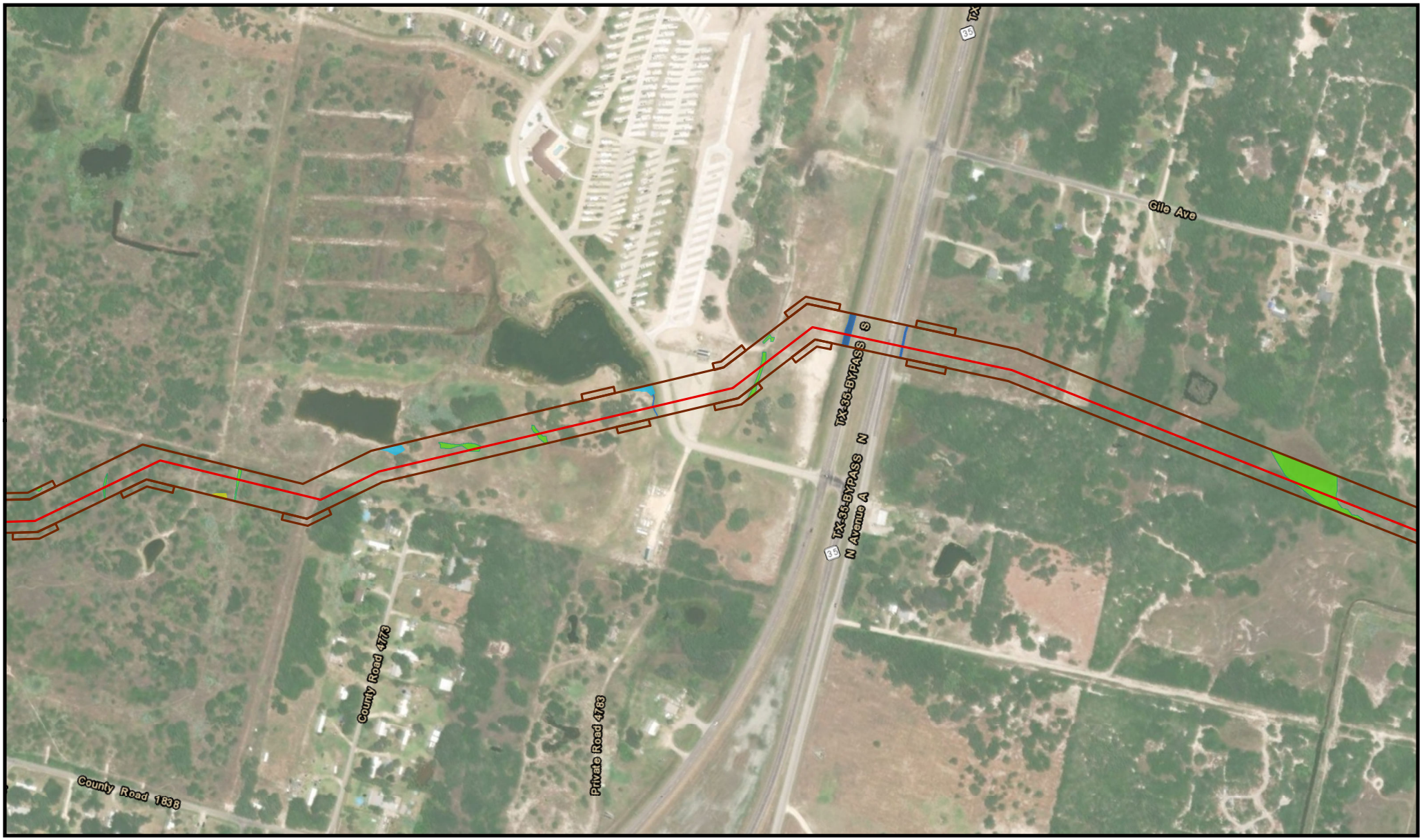
N W E S

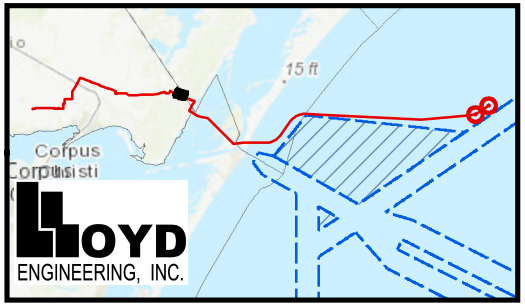
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 21
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
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- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

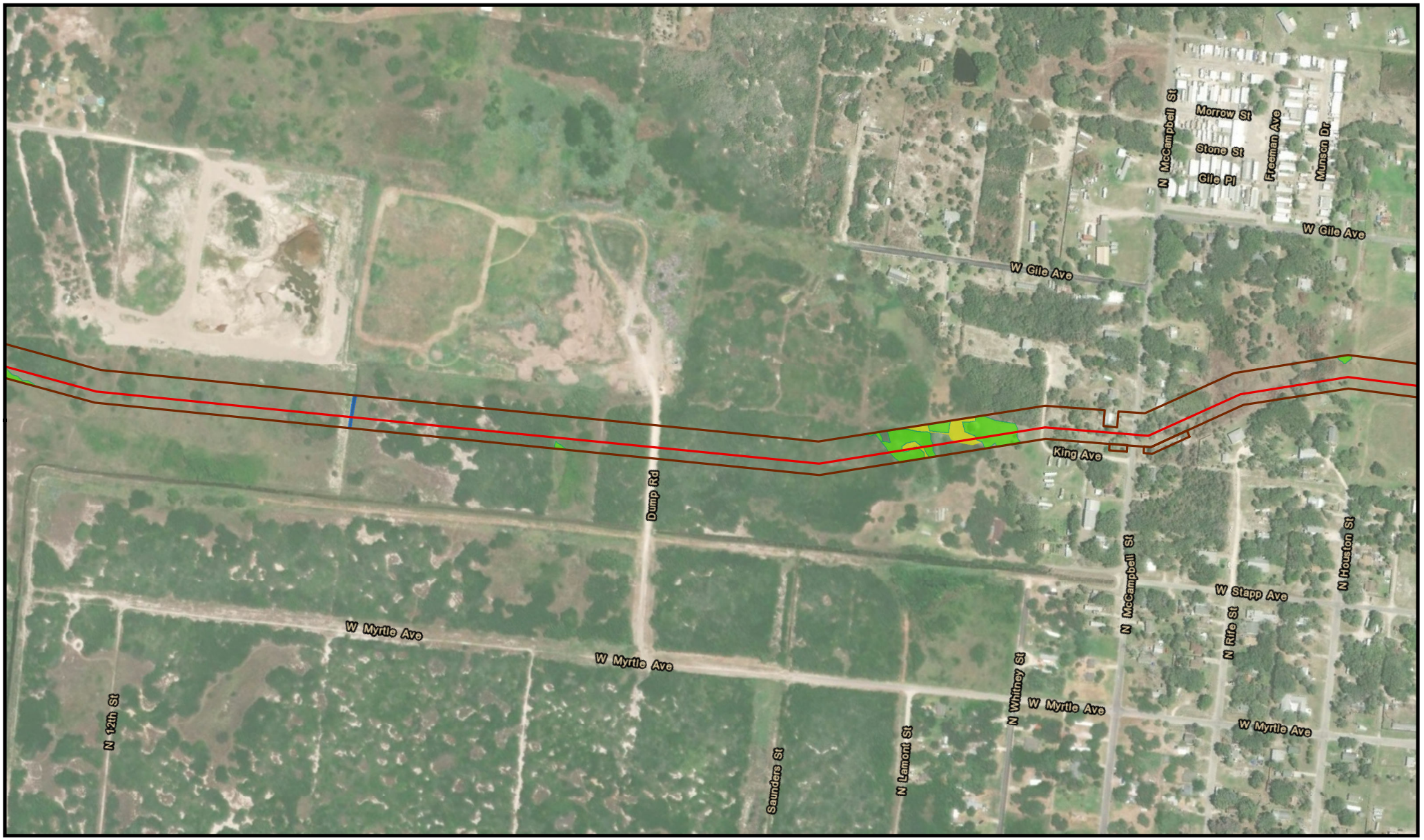
Feet

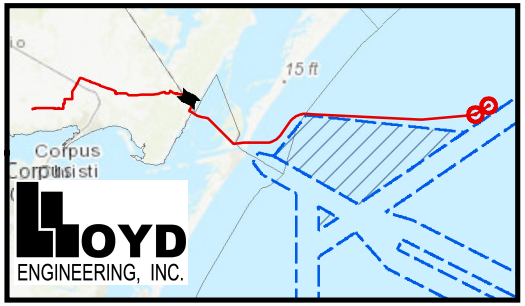
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 22
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
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1 inch = 500 feet

0 250 500

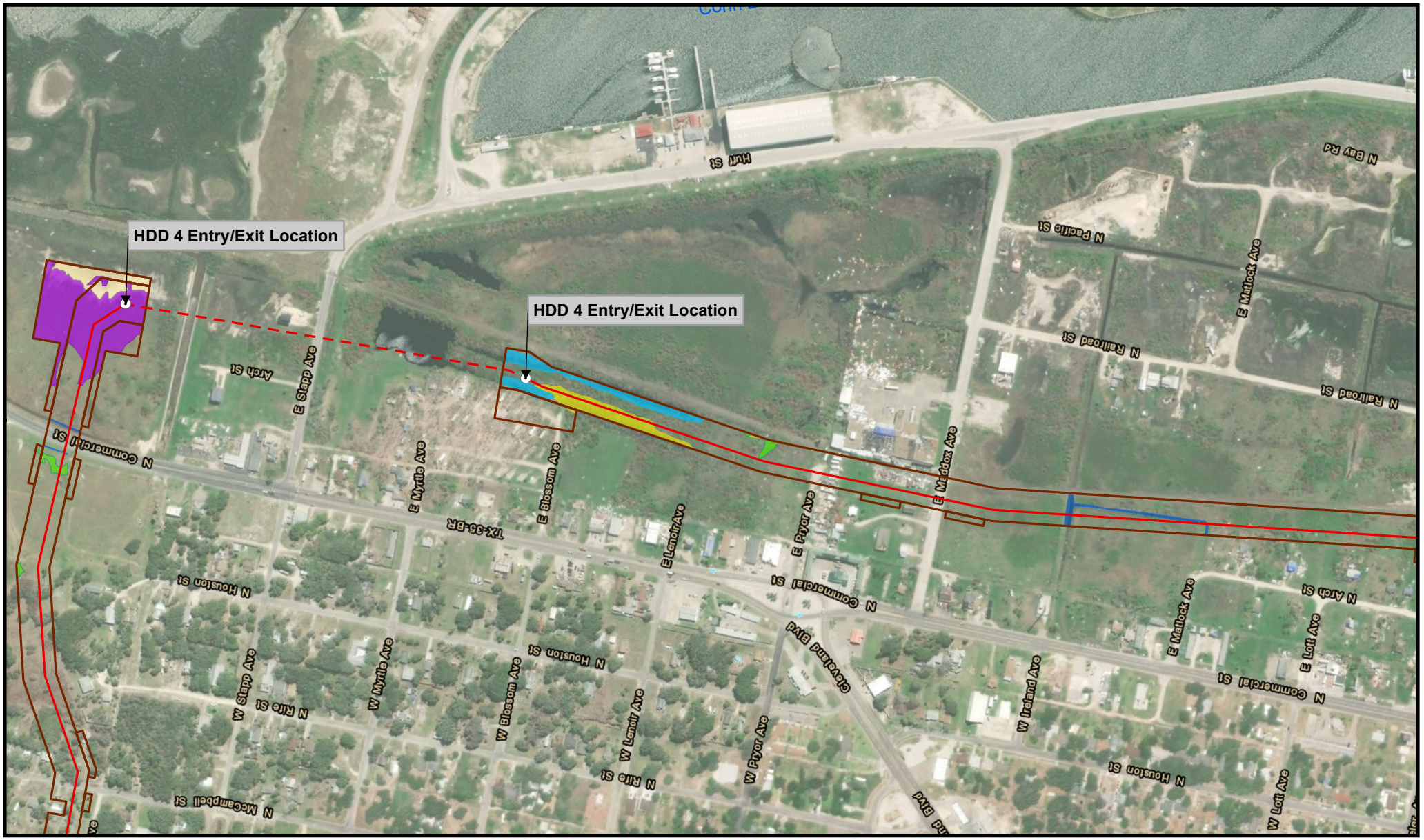
Feet

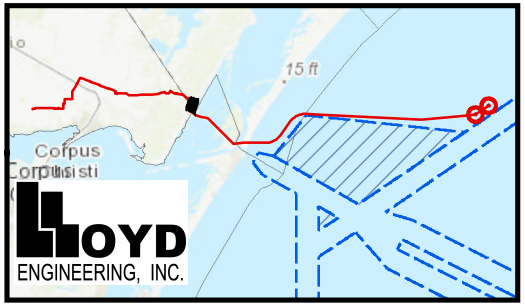
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 23
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

1 inch = 500 feet

0 250 500

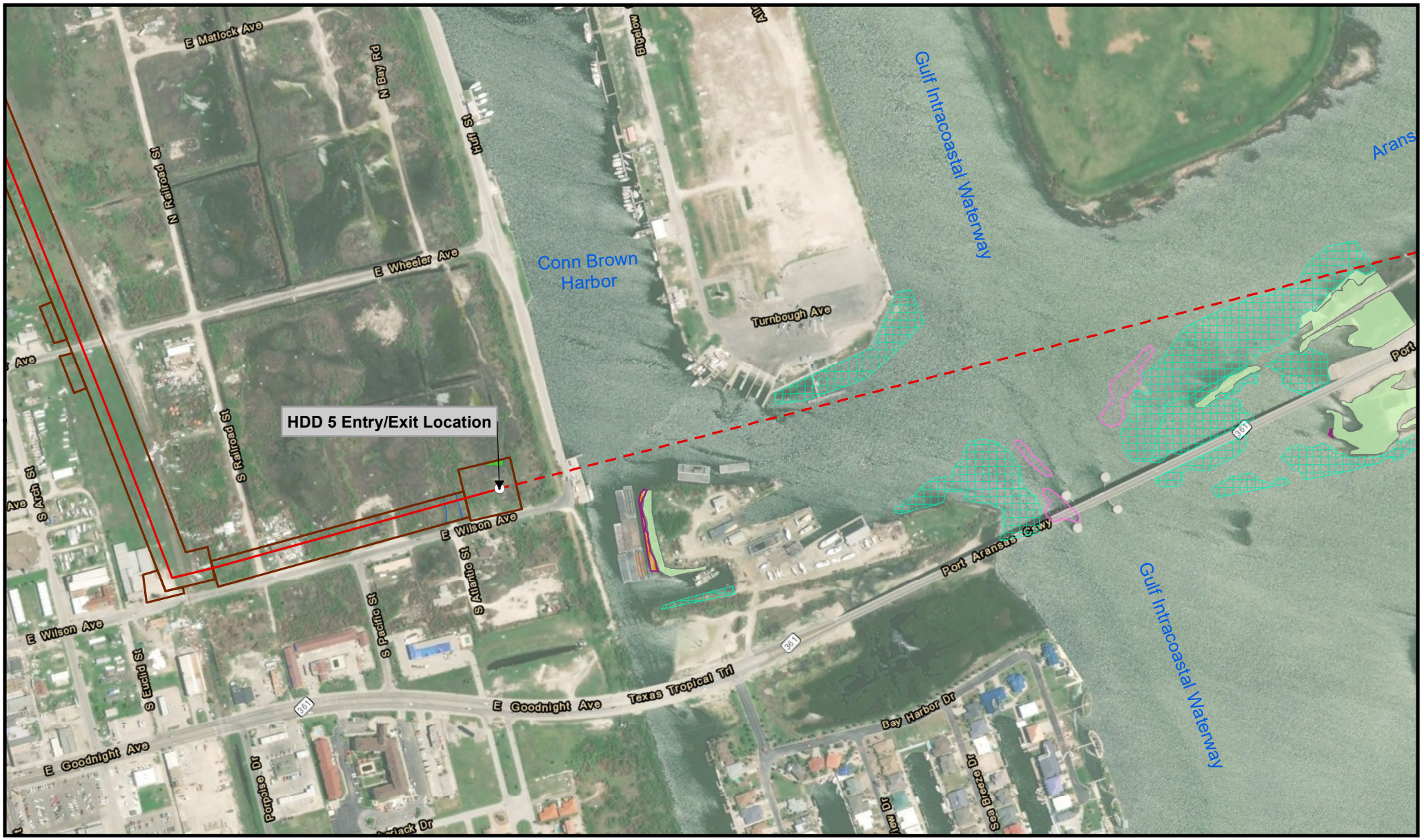
Feet

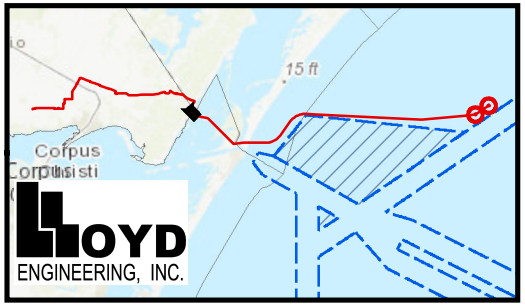
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 24
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

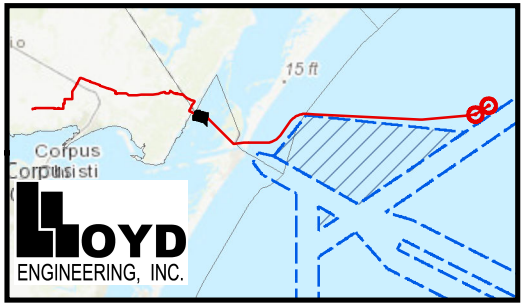
Feet

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 25
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

Feet

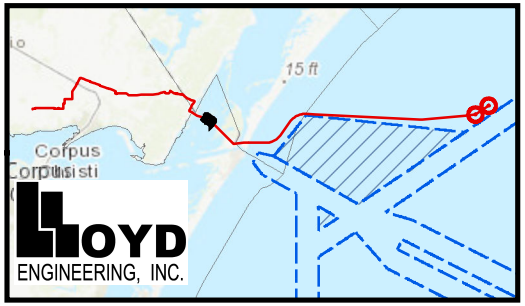
N E S W

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 26
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

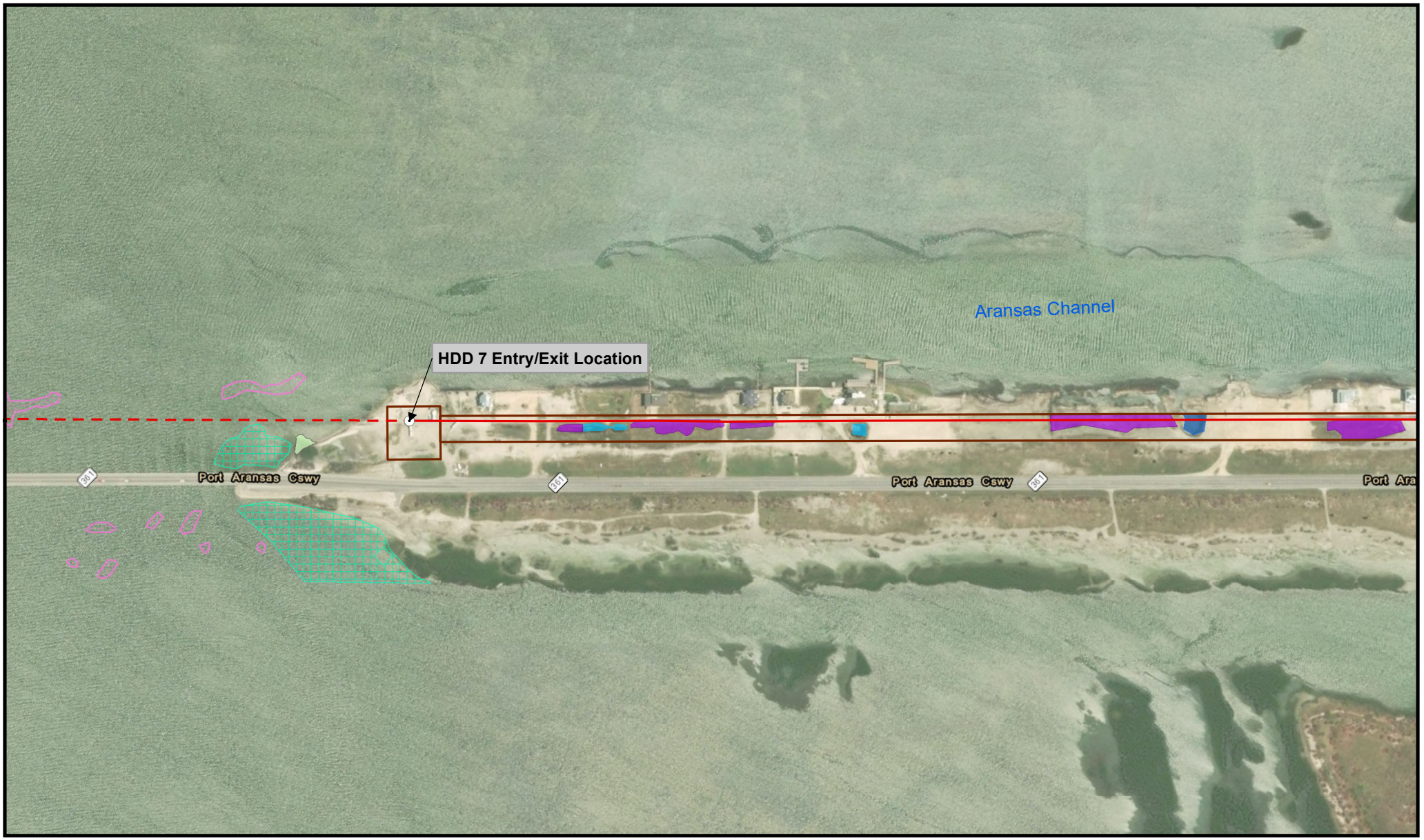
Feet

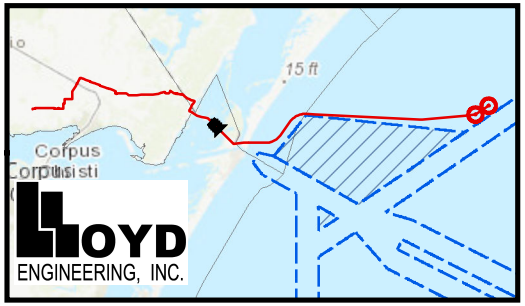
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 27
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

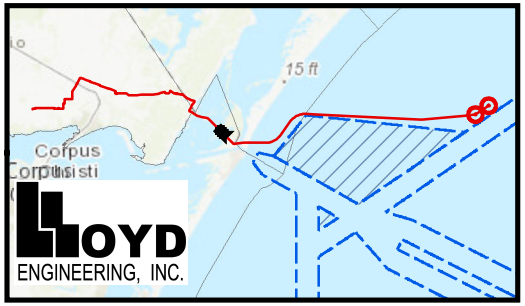
Feet

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 28
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

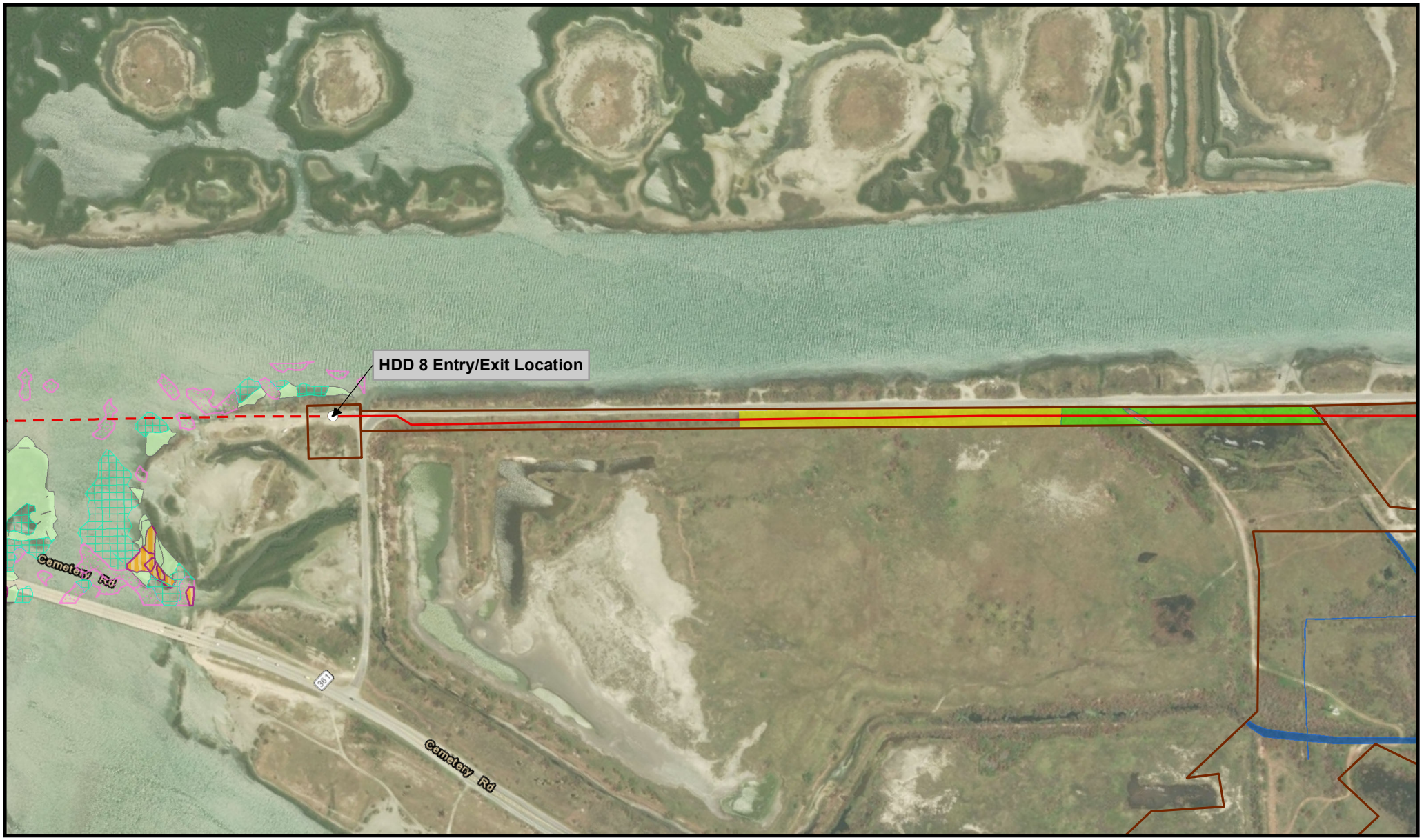
Feet

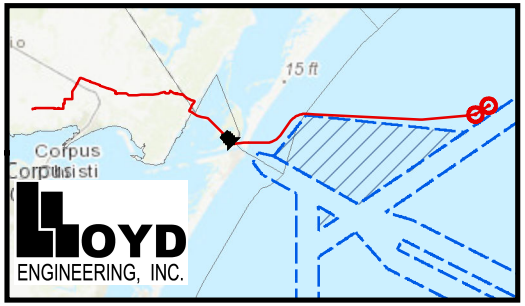
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 29
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

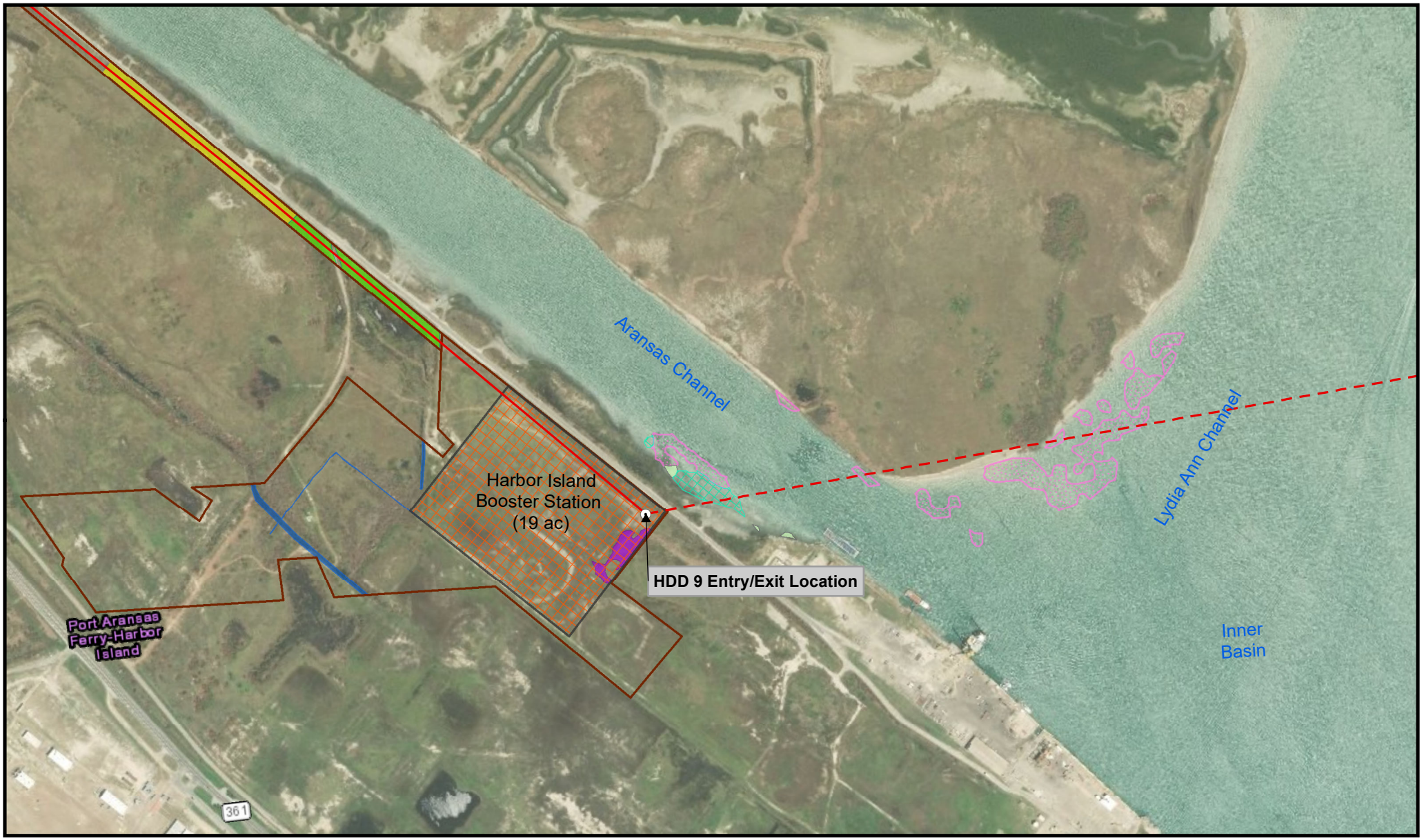
Feet

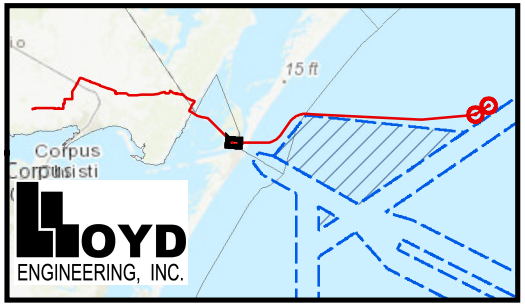
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 30
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Harbor Island Booster Station
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 670 feet

0 337.5 675

Feet

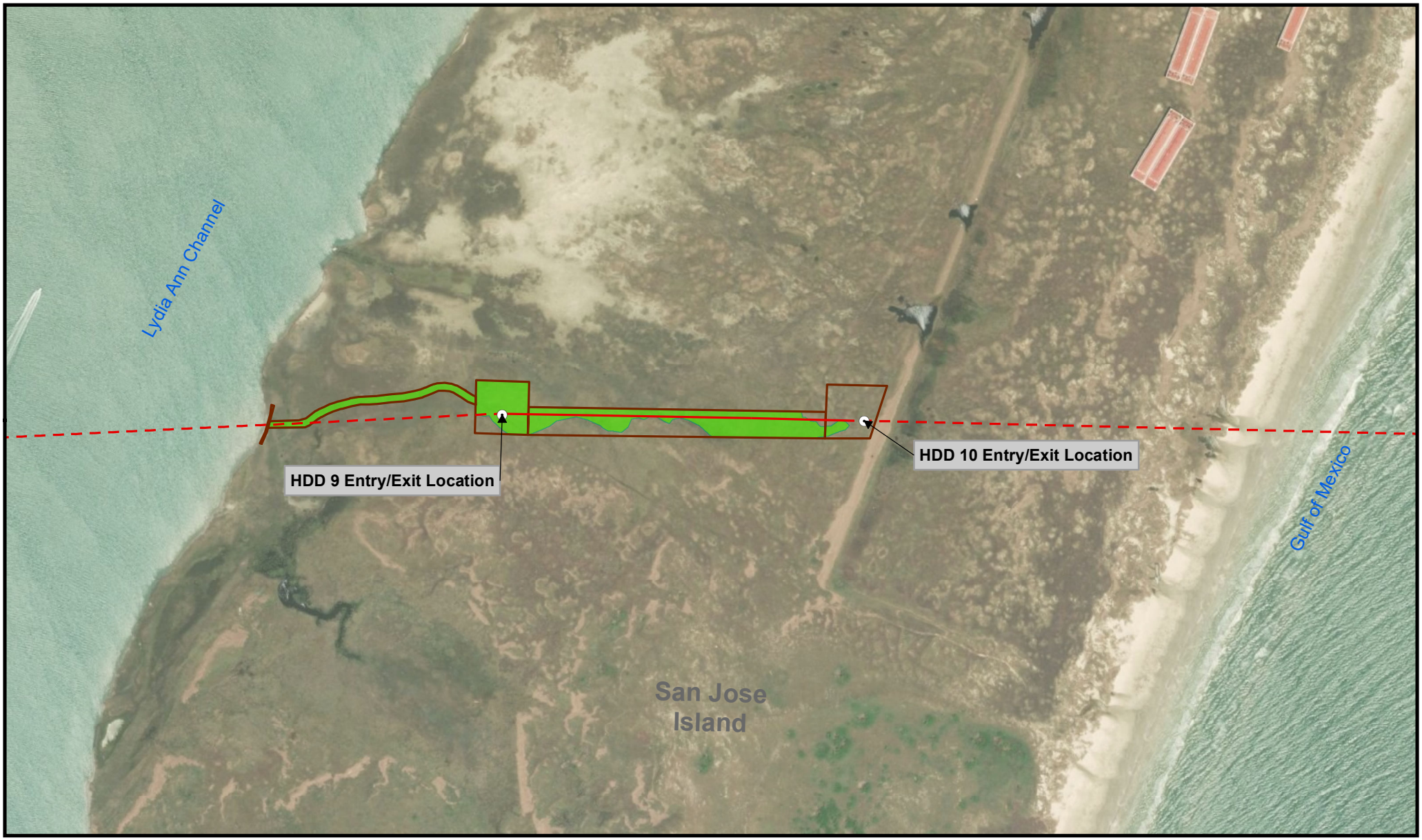
N W E S

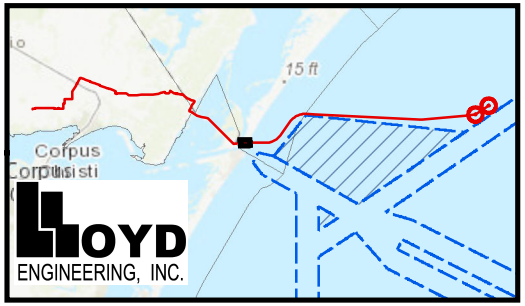
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 31
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

Feet

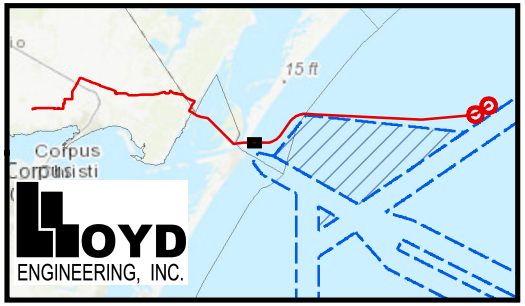
N W E S

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 32
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019



Map Details

- HDD Entry/Exit Points
- Pipeline Centerline
- HDD Pipeline Centerline
- Construction Workspace

Wetlands and Waterbodies

- PEM Wetland
- PSS Wetland
- PUB Pond
- Waterbody
- E2EM Wetland
- E2SS Wetland
- E2USP Area
- M1UB Area

Aquatic Resources

- Algae Bed
- Intertidal Wetland
- Scattered Oyster Shell
- Seagrass
- Shell Hash

1 inch = 500 feet

0 250 500

Feet

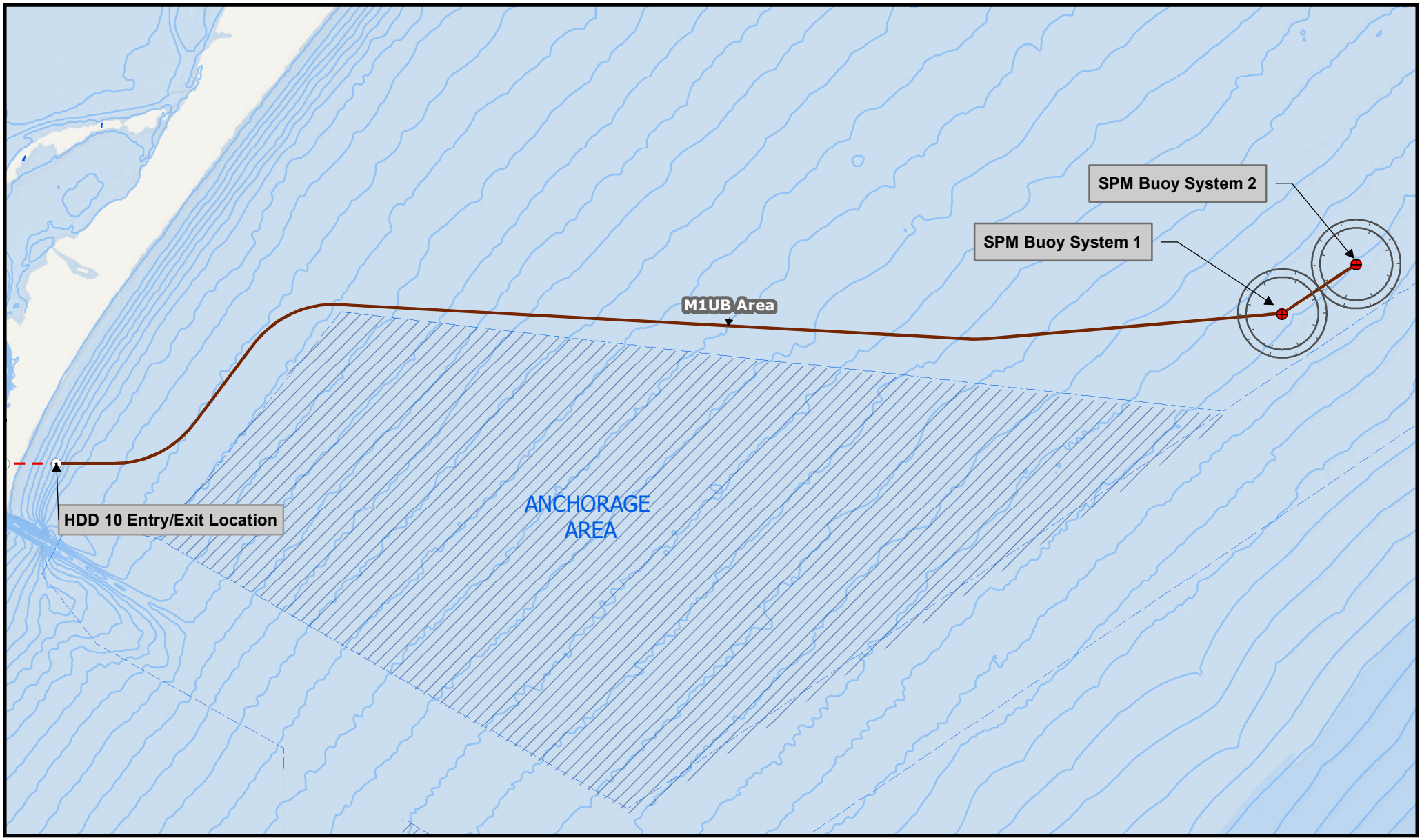
N
W E
S

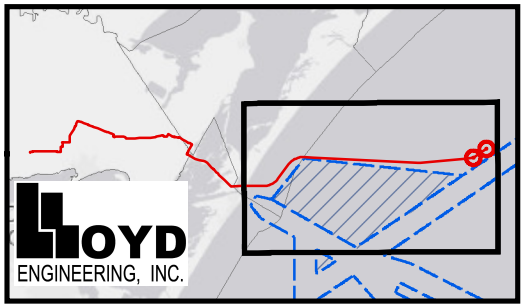
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 33
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





LLOYD ENGINEERING, INC.

Map Details

- SPM Buoy System
- SPM Buoy ATBA and Safety Zones
- HDD Entry/Exit Points
- Construction Workspace
- Pipeline Centerline
- HDD Pipeline Centerline
- Navigational Fairways
- Anchorage Areas
- Bathymetry Contours (m)

Impacted WOUS

- M1UB Area

1 inch = 2.5 miles

0 1.25 2.5

Miles

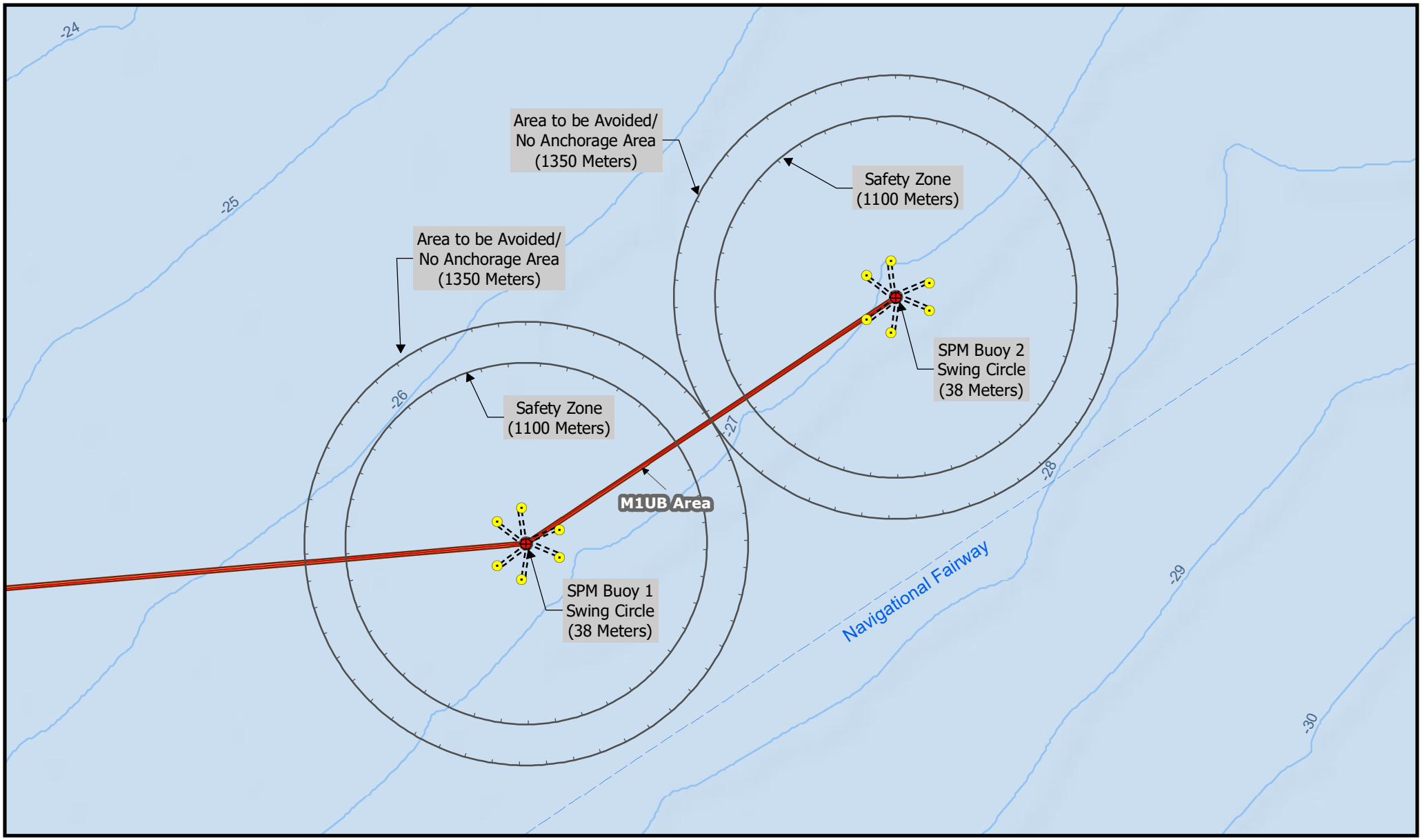
N W E S

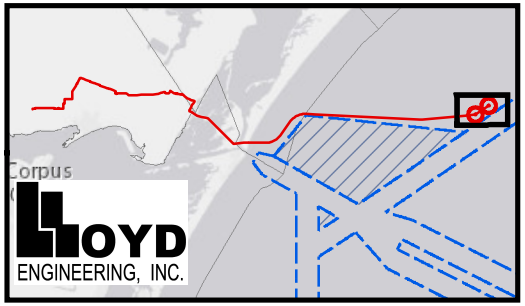
Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 34
Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019





Map Details

- SPM Buoy System
- CALM Anchor Pile Location
- CALM Anchor Chain
- SPM Buoy ATBA and Safety Zones
- Pipeline Centerline
- Construction Workspace
- Navigational Fairways
- Bathymetry Contours (m)

Impacted WOUS

- M1UB Area

1 inch = 0.5 miles

0 0.25 0.5

Miles

N W E S

Coordinate System: NAD 1983 2011 StatePlane Texas South FIPS 4205 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

Figure 35
Proposed Project Detail Map

Bluewater SPM Project
Bluewater Texas Terminal, LLC

Date: May 09, 2019