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Berthing Dock Facility and Beneficial Use Dredge Management Placement Area Project

Dredged Material Management Plan

Texas International Terminals

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Table of Contents

Acronyms and Abbreviations

BU	beneficial use
Channel	Houston Ship Channel
CWA	Clean Water Act
CY	cubic yard(s)
DMMP	Dredged Material Management Plan
DMPA	dredge material placement area
EPA	U.S. Environmental Protection Agency
GIWW	Gulf Intracoastal Waterway
MCY	million cubic yards
MLT	mean low tide
NEPA	National Environmental Policy Act
NWP	Nationwide Permit
SAP	Sampling and Analysis Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
TXGLO	Texas General Land Office
TXIT	Texas International Terminals
USACE	U.S. Army Corps of Engineers

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Executive Summary

Texas International Terminals (TXIT) is providing this Dredged Material Management Plan (DMMP) to the U.S. Army Corps of Engineers (USACE) Galveston District as part of a Section 10 and Section 404 permit application amendment to SWG-2012-00602. TXIT is requesting to amend the existing authorization from the USACE to dredge an approximately 33-acre (1,437,000-square foot) unvegetated open water area within an existing basin associated with TXIT waterfront facilities and place the dredged material within a proposed Beneficial Use Dredge Material (BUDM) placement area (PA) (the Project). The BUDM PA site design is illustrated in the associated USACE permit amendment application exhibits.

The proposed dredge activity will include the hydraulic and/or mechanical dredging of the 33-acre area within an existing basin associated with TXIT waterfront facilities located immediately south of the Galveston Ship Channel (the Channel) and immediately adjacent to the east of the Pelican Island Causeway bridge. The area will be dredged to a minimum depth of -45-feet mean lower low water (MLLW) with a -2-foot over-dredge for a period of 10 years. The proposed dredge area extends from the shoreline at TXIT to the property limits with a purpose of connecting the slips to channel depth.

Placement of approximately 1,504,212 cubic yards (CY) of dredged material from the initial dredge cycle is to be utilized to construct berms for Cell 1 within a proposed 125-acre BUDM PA to be constructed within a privately-owned unvegetated open water area located immediately west of Pelican Island Causeway and abutting a TXIT-owned and operated upland confined placement area (PA 5600) to the north. TXIT is also requesting retainment of placement of dredge material in to two previously-authorized upland confined placement areas and adding five Port of Galveston ship slips (#12, 14, 37, 39, 41) as well as the Port of Galveston PA.

Configuration of the proposed 125-acre BUDM PA site consists of 4 cells that will be constructed in phases. Construction of BUDM PA cell #1 containment dikes will utilize all or a part of the approximately 1.50 million cubic yards (mcy) of dredge material collected from the first dredge cycle. The BUDM PA will receive an additional approximately 4.0 mcy of dredge material over approximately 36 maintenance dredge cycles (112,000 cy per cycle) to construct cells 2, 3, and 4. Aside from dredge material, BUDM PA containment dike construction will be accomplished using in-situ material within the proposed BUDM PA site. The containment dikes will allow for the placement and consolidation of the maintenance material and protection of the site from wind generated waves and day-to-day tidal movement. Ultimately, completion of all four cells will result in the creation of approximately 78-acres of low/intertidal marsh and 32-acres of circulation channels.

Wetland delineations and oyster and seagrass aquatic resource surveys were conducted on July 11, 2018, by Atkins scientists. No wetlands, oyster reefs, or seagrass beds were observed within the area of proposed BU area. Neither scattered nor consolidated oyster communities were found within the proposed BU area. An associated bathymetric survey was also performed by Callan Marine, Ltd. The survey determined that depth of water on the BUDM PA site varies between 5 and 9 feet across the footprint and that the site generally has a sandy foundation of varying thickness over top of a soft to stiff clay layer.

1. Introduction

1.1. Background

TXIT is a multi-modal liquid and dry bulk facility for deep draft vessel, unit train, manifest rail, barge, and trucking along the Galveston Ship Channel (the Channel). It operates as a full-service terminal, stevedore, and material handler within a single facility on the United States Gulf Coast providing rail, marine, and highway connectivity. Currently, the facility has three barge berths and one deep-draft vessel berth.

1.2. Objective and Scope

The objective of this DMMP is to allow for dredging of an existing basin associated with TXIT waterfront facilities in an efficient, environmentally sound, and logistically feasible manner. The scope of this DMMP includes a regulatory overview, a review of previous materials testing, a review of available dredging and material transport technologies, and the identification and evaluation of potential placement within the BUDM PA and other placement options. Additionally, this DMMP notes the results of an oyster/seagrass survey and wetland delineation that was conducted prior to placement of material at the BUDM PA site.

2. Regulatory Overview

Regulatory responsibility for dredging and dredged material discharge is shared between federal, state, and local government entities. This section provides an overview of environmental administrative agency authority and the regulations required in the dredging of any real estate property managed, owned, and/or operated by a U.S. Federal Government agency or State of Texas agency. On the federal level, the USACE and U.S. Environmental Protection Agency (EPA) share the responsibility for regulating the dredging and discharge of dredged material. In Texas, regulations are carried out by the Texas Commission on Environmental Quality (TCEQ), Texas General Land Office (TXGLO), and the Texas Parks and Wildlife Department (TPWD).

2.1. U.S. Federal Regulations Overview

The primary federal environmental statute governing the discharge of dredged material into waters of the U.S. is the Federal Water Pollution Control Act Amendments of 1972, also known as the Clean Water Act (CWA). For dredged material placed within the territorial seas for other purposes, such as beach nourishment, island creation, and aquatic habitat enhancement, the activity is regulated under the CWA.

All proposed dredged material placement activities regulated by the CWA must also comply with applicable requirements and regulations of the National Environmental Policy Act (NEPA) and a number of other federal laws and executive orders involving the discharge of dredged material. NEPA serves as an umbrella authority that assures all applicable environmental requirements are complied with for federal dredging projects (USACE, 2003).

2.2. Texas State Regulations

The Texas Administrative Code (TAC), created in 1977 by the Texas Legislature under the Administrative Code Act, is a compilation of all state administrative agency regulations in Texas. The state agencies in Texas authorized to regulate dredging activities and dredged material or fill disposal in state waters are TXGLO, TCEQ, and TPWD.

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3. Project Description and Dredging Requirements

3.1. Description of the Project Area

TXIT proposes to perform dredging activities within their existing, privately owned basin immediately south of the Channel, a navigational channel which provides access south of Pelican Island from West Galveston Bay to the Gulf of Mexico. An overview of the entire project area, location, and design of the BUDM PA and location of additional PAs can be found in the associated USACE permit plan exhibits.

3.2. Material Characteristics

A recent bathymetric survey was also performed by Callan Marine, Ltd. The survey determined that depth of water on the BUDM PA site varies between 5 and 9 feet across the footprint and that the site generally has a sandy foundation of varying thickness over top of a soft to stiff clay layer.

Geotechnical borings in the Project area were performed in 2017. On average, more than 93 percent of the maintenance material is comprised of silt and clay, with a percentage consisting of varying sand based on the water depth in the surrounding bay. The borings typically showed sandy soils down to approximately -30 feet MLLW, underlain by lean clay and fat clay soils to depths beyond approximately -100 feet MLLW.

3.2.1. Soil Data Collected for the Project

Historically, the Project area and the proposed location of the BUDM PA has been tested concurrent with actual dredging and placement activities within the past three years. Testing results have shown material to not exceed *de minimus* criteria for contaminants.

3.3. Dredging Requirements

3.3.1. Dredge Areas and Quantities

TXIT will perform dredge activities within a 1,405,650-square foot (33-acre) unvegetated open water area to a minimum depth of -45-feet MLLW with a -2-foot over-dredge for a period of 10 years. As additional BU placement options, TXIT also proposes placement in two previously-authorized upland confined placement areas (PA) - PA 5600, PA 4800, and add five proposed additional PAs – the Port of Galveston ship slips (#12, #14, #37, #39, #41) and the Port of Galveston PA.

3.3.2. Dredging Method

TXIT plans to utilize hydraulic suction and mechanical dredging for the proposed new cut and maintenance dredge activities within the Project area. Studies have shown that this dredging method produces less turbidity at the construction site than other conventional dredges. The dredge contractor will use best management practices (BMPs), in addition to controlling depth of dredge and maintaining efficient dredging operations, to reduce on-site turbidity during construction.

A hydraulic suction and/or cutter dredge usually pumps the slurry for disposal directly to a placement area and, less often, pumps to scows for disposal. Dredged material can be pumped for a distance of 25,000 feet (approximately 4.7 miles) and that distance may be extended to 50,000 feet (approximately 9.5 miles) or greater with the addition of booster pumps.

Hydraulic suction and/or cutter dredges are the most economical form of dredging when they are operated continuously, can place the dredge material relatively close to the dredging site, and the material is not too compact to be excavated.

4. Description of Placement Options

Multiple dredge material placement area (DMPA) options are also being considered by TXIT for the placement of the Project area's dredge material. Due to a combination of factors (e.g., planning, longevity, environmental, and engineering concerns), TXIT has decided to utilize the proposed BUDM PA site for the placement of the bulk of the dredged material.

4.1. Summary of Placement Options

TXIT is proposing to place the dredge material into a proposed BUDM PA located within an unvegetated open water area located immediately west of the Pelican Island Causeway and immediately north of the a TXIT-owned and operated upland confined PA 5600. Along with BUDM PA placement, TXIT is also considering the use of the other aforementioned PAs and ship slips for material placement.

4.1.1. Confined Placement Areas (Upland and Ship Slips)

A confined placement area is an engineered structure for containment of dredged material. The facility is bounded by containment dikes or structures designed to isolate the dredged material from its surroundings. The disposal facility may be completely on land, surrounded by water, or a combination of both. Material is placed either mechanically or hydraulically. Dredged material placed in these facilities is either wet or a slurry, and the facility is designed to decant the water and allow the dredged material to settle and stabilize over time.

Although the confined disposal facility is isolated from the surrounding area, each facility has minimum requirements for levels of contamination, most facilities follow sediment requirements set forth by a local or regional authority. Two previously authorized upland confined PAs located on TXIT property within the immediate vicinity of the Project area were considered as additional placement options for dredged material: PA 5600 and PA 4800; along with five Port of Galveston ship slips (#12, #14, #37, #39, #41) and the Port of Galveston PA.

4.1.2. Beneficial Use Dredge Material Placement Area

BUDM PAs are associated with dredged material that is no longer being regarded as a "spoil" or "waste", but as a resource. Beneficial use of dredged material may be defined as the placement or use of dredged material for some productive purpose. Its mineralogy and geotechnical properties qualify it for use in the manufacture of high-value, beneficial use purposes such as marsh terraces, bird islands, or dune/beach nourishment.

Dredged material may be used for coastal beach nourishment, upland restoration, filling degraded basins and pits, creating and restoring wetlands for water quality treatment and habitat, and creation/restoration of other habitats, such as oyster reefs and bird habitat.

Beneficial use end products include topsoil, construction-grade cement, lightweight aggregate, bricks, and architectural tile. All dredged material proposed for beneficial use is evaluated in a framework that protects human health and the environment, and these beneficial uses can come at a cost savings to the public. Beneficial use placement for marsh restoration will be utilized for the placement of maintenance dredged material from the Project.

5. Evaluation of Placement Options

5.1. Evaluation Criteria

The criteria used in the selection of DMPAs for the placement of the proposed maintenance dredge material and fill are as follows (USACE, Galveston District, 2013).

- Dredge Method—Various dredge methods are required for each placement area type. Each dredge method will have different advantages and/or disadvantages.
- Proximity—Regarding pumping distance, the farther the site is from the channel, the greater the cost of pumping activities. Longer pipe requiring boosters is less efficient than shorter pumping distances.
- Cost—Measures that are expensive due to construction cost, environmental impacts, and resultant mitigation costs will be eliminated from further study.
- Environmental Concerns—A measure that increases (or causes) adverse impact on sensitive habitats or species that cannot be mitigated in a cost-effective way will be eliminated from further study.
- Engineering Concerns—Any site considered for a new placement area, upland confined or BU, must be large enough to provide the required capacity for the 10-year DMMP. The existing soils at any site considered for placement must be able to provide adequate foundation support and meet acceptable borrow quality for containment dike or levee construction as required to provide the required capacity. New placement-area sites must be accessible for entry of construction equipment and crews and for dredge pipe entry either by direct access from the federal channel or via pipeline easement(s). New placement area sites must be situated such that dredging effluent water can be drained from the site in a manner that minimizes impacts to the environment and that allows for proper management of water quality.

Additionally, the environmental benefit, various potential regulatory and ownership constraints, and the potential effects on the Channel were taken into consideration during the placement area evaluation phase. The primary and most favorable placement alternatives considered in this DMMP were beneficial use applications. However, USACE open-water placement areas within the Port of Galveston ship slips along the channel, as well as confined upland PAs are also considered viable options.

5.2. Confined Upland Placement Options

5.2.1. PA 5600, PA 4800

TXIT considered confined placement at two previously-authorized upland confined PAs: PA 5600, PA 4800. The benefit to placing material in PA 5600 and PA 4800 is that these areas are located within close proximity to the Project area, and it would be relatively low cost to transport the sediment. However, these sites do not have capacity to accept the entire volume of dredge material associated with a Project of this scale.

5.2.2. Port of Galveston Ship Slips & PA

TXIT, with the assistance of Atkins, also considered confined placement at five Port of Galveston Ship Slips #12, 14, 37, 39, and 41 as well as the Port of Galveston PA (illustrated in the associated USACE permit plan exhibits). The benefit of placing the material in these designated PAs is that it is located within proximity to the Project area, would be relatively low cost to transport the sediment, would be contained by existing concrete retaining structures associated with the ship slips, and would provide material the Port of Galveston requires for facility expansion.

5.3. Beneficial Use Dredge Material Placement Option

A potential beneficial use location was identified west of Pelican Bay Causeway, adjacent to the north of a TXIT-owned and operated confined upland PA (PA 5600). The depth of water within this location varies

between 5 and 9-feet across the proposed footprint. The site generally has a sandy foundation of varying thickness over top of a soft to stiff clay layer. The site is located adjacent to industrial and developed areas, the GIWW alternate channel and the Galveston Ship Channel. Although many options exist for the use maintenance dredged material, TXIT and Atkins opted for marsh creation within a proposed BUDM PA to be constructed in association with Project dredging activities.

Phased construction of a four-cell, 125-acre BUDM PA will begin with the initial construction of one cell utilizing the 1.50 mcy of dredge material from the first dredge cycle. The BUDM PA will receive an additional approximate 4.0 mcy of dredge material over approximately 36 maintenance dredge cycles (112,000 cy per cycle) to then construct cells 2, 3, and 4. The cells will be developed over time by constructing containment dikes (see permit plan exhibits). BUDM PA containment site construction will be accomplished using both dredge material and in situ material within the proposed BUDM PA site. The containment dikes will allow for the placement and consolidation of the maintenance material and protection of the site from wind generated waves and day-to-day tidal movement. Ultimately, the completion of all four cells will results in approximately 78 acres of low/intertidal marsh and 32 acres of circulation channels.

5.3.1. Marsh Creation in Open-Water Area

As previously mentioned, TXIT would use proposed maintenance dredge material to convert the unvegetated open-water area into approximately 78-acres of low/intertidal marsh and 32-acres of circulation channels. The basic mechanism envisioned with this approach is to place material into these substantially confined areas to a height that, after settling, will result in an elevation capable of supporting new and more extensive tidal-marsh planting.

Once the TXIT BU site has dewatered and the material is stabilized, planting will commence. The overall dimensions and depth of the planting area varies across the BUDM PA. Native plants will be utilized and natural colonization is encouraged. However, transplanting of smooth cordgrass (*Spartina alterniflora*) will be done to regulate vegetative community development. All plants will be live and healthy at the time of planting in planting plugs of 2-4 stems per plug. Planting rows will be staggered to discourage open pathways in the direction of water flow. The transplants (plugs) will be planted on staggered, 3 ft center intervals. All transplants subject to wave action will be protected with temporary reinforced, silt fencing until the plants are established. The newly established marsh cells will protect a unimproved shoreline.

5.4. No-Action

Dredging of the proposed project area is required to provide facilities and deepwater access to further support the improved serviceability, accommodation, and navigation of vessels used for import and export of bulk cargo, oil, and petrochemical products. The No-action alternative is defined as no maintenance dredging, thus no need for identifying a DMPA. Under the No-action alternative, the facility would not be able to safely accommodate ship and barge traffic, which could have adverse impacts on the economy and development of the region.

6. Wetland, Oyster, and Seagrass Resources in Galveston Bay

BUDM placement has been selected by TXIT as the preferred option (between BUDM, PAs, and ship slips) for placement of the entire approximate 4.0 mcy dredged material over the life of the project. BUDM placement is the most feasible option based on cost, land ownership, and environmental and engineering concerns. TXIT is aware that fringing wetlands, scattered and consolidated oyster communities, and small areas of seagrass beds are present in Galveston Bay. As such, the following survey protocol was used in confirming the presence or absence of all aquatic resources within the proposed BU placement area.

6.1. Wetland, Oyster, and Seagrass Survey

Construction of the BUDM placement area and subsequent placement of the dredged material is dependent on the results of a wetland, oyster and seagrass survey, as performed prior to initiation of construction activities. A wetland delineation (per Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA)) was conducted. A separate survey for the oyster and seagrass aquatic resources was conducted in two phases in accordance with protocols accepted by the U.S. Fish and Wildlife Service (USFWS), the Texas Parks and Wildlife Department (TPWD), and the National Marine Fisheries Service (NMFS). An initial desktop review was performed followed by subsequent field survey to evaluate site characteristics and determine the presence/absence of wetlands/waters of the United States and oysters and seagrasses, and/or their suitable habitat.

6.1.1. Section 404/10 Wetland Survey

As required by existing regulations or regional general permits, potential wetlands, as defined by the U.S. Army Corps of Engineers (USACE) 1987 Wetlands Delineation Manual (Environmental Laboratory, 1987), were evaluated based on the presence or absence of hydrophytic vegetation, wetland hydrology, and hydric soils, as amended by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0) (Regional Supplement) (USACE, 2010). Plant species were classified and indicators of wetland hydrology were identified and recorded. Additionally, associated soils were inspected for indicators of hydric conditions. The 2016 National Wetland Plant List (NWPL) website, Version 3.3 (Lichvar, et al., 2016) was reviewed to determine the indicator status of plant species. Taxonomy of plant species follows Lichvar, et al. (2016) and the NRCS Plant Database (USDA NRCS, 2014). At sample areas where hydrophytic vegetation, soil, and hydrology indicator criteria were met, the area was identified as a wetland and categorized following suggestions of Cowardin, et al. (1979).

Delineation of potential jurisdictional areas (WOUS, including wetlands), as defined by 33 CFR 328, was conducted within approximately 1-acre of land within the total 126-acre survey area encompassing the Project site. Delineations included assessments of ephemeral, intermittent, and perennial streams, navigable and non-navigable waterways, and wetlands. A Trimble GeoXH 7000 differentially corrected global positioning system (DGPS) unit (hereafter, "Trimble unit"), with sub-meter accuracy, was used to map each feature identified. No jurisdictional wetlands were identified within the Project site.

6.1.2. Special Aquatic Resource Survey

In accordance to Phase I, surveys for oyster and seagrass verification was conducted in two ways, depending on water depth. Within water that was less than three feet deep, surveys were conducted using a standard, weighted, 16-tine metal rake to serve as both a dredge and sounding pole. Rake sampling was conducted along existing riprap located primarily along the shoreline of the survey area's eastern and western boundaries. At depths greater than three feet, surveys were conducted from a boat, using an oyster dredge. The dredge was pulled behind the boat along the open-water transects, removed from the water, and checked for aquatic resources every 150 to 200 feet before being put back into the water to resume sampling.

Data regarding the presence or absence and delineated extent of oysters and seagrasses were recorded during each sampling event, and a Trimble unit was used to map each data point and feature identified. Collected data then were mapped in accordance with USACE Galveston District standards. No oysters or seagrasses were confirmed as present within the project boundary. As such, Phase II, or the characterization of oysters and seagrasses, was not necessary.

6.1.3. Reporting

A final report of the wetland delineation and oyster and seagrass survey has been submitted to the USACE with an associated permit amendment application. The report provides GIS map figures of all resources surveyed, location of transects, sampling data points, and/or other pertinent features. Photo documentation will also be provided to support the findings, if requested. Construction will not be initiated until the wetland delineation and special aquatic resources survey report has been reviewed and approved by USACE and other state and federal agencies including TPWD and/or the USFWS.

6.2. Aquatic Resources Mitigation Plan

Mitigation of aquatic resources is dependent upon the percentage of jurisdictional wetlands, live consolidated oyster populations and seagrass surveyed within the BUDM PA site. No wetlands, oyster populations, or seagrass beds were identified during the surveys, so mitigation actions are not required.

7. Marsh Creation Monitoring

In concurrence with BUDM PA phased cell construction, TXIT will initially monitor created marsh cells 6 months after subsequent planting to assess survival of planted vegetation, and then every year up until 5 years (years 1 through 5). TXIT will prepare and submit a marsh monitoring report, including site photographs and sampling methodology, to the USACE within 30 days of each monitoring event.

Monitoring reports will document the following:

- Estimated remaining constructed marsh planting area;
- Estimated vegetative cover within the marsh planting area;
- Qualitative assessment of the health and quality of the species planted;
- Recommendations and/or corrective actions, if needed, for the following monitoring period; and
- Additional reporting requirements, based on the relative success of the project.

At the 6-month monitoring event, should survival of planted vegetation be less than 30 percent of plantings, TXIT will replace/replant dead plants within 90 days. The same will be done should planted vegetation survival be less than 70 percent after year 3. Per USACE guidelines, at least 70 percent of the created marsh should remain 5 years post-construction and planting. In the event that this not be the case, corrective actions and additional monitoring will be proposed for the site. It is important to note that marsh creation will commence with the first maintenance cycle from the newly created ship berths. New work material will be utilized for berm creation.

8. Summary & Conclusion

TXIT is providing a permit amendment to the USACE Galveston District to improve dock facilities and place dredged material within Galveston Bay. TXIT is requesting authorization from the USACE in support of the proposed TXIT dredging project located within an existing basin immediately south of the Galveston Ship Channel in Galveston, Galveston County, Texas. The proposed BUDM PA is located within an unvegetated open water located immediately west of the Pelican Island Causeway and immediately north of the City of Galveston Waste Water Treatment Plant.

Based on cost, a favorable landowner environment, and environmental and engineering concerns, the BUDM PA located in Galveston Bay was chosen as the most feasible for the management of the excavated dredged material. This method of dredge placement would take approximately 10 years and would present a manageable cost and low engineering concern, while providing a valuable environmental and ecological benefit without adversely affecting known oyster communities. In concurrence with BUDM PA phased cell construction and marsh creation, TXIT will monitor created marsh cells for a period of 5 years post-construction.

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