Appendix A: Council Member Applicant and Proposal Information Summary Sheet

Council Member: Department of Army, Army Corps of Engineers	Point of Contact: Janelle Stokes Phone: 409/766-3039 Email: janelle.s.stokes@usace.army.mil

Project Identification

Project Title: Restoration of Whooping Crane Critical Habitat with Beneficial Use of Dredged Material | Project

State(s): Texas | County/City/Region: Aransas and Calhoun, Counties

General Location: *Projects must be located within the Gulf Coast Region as defined in RESTORE Act. (attach map or photos, if applicable)*
Within coastal zone boundaries for Texas Coastal Management Program

Project Description

RESTORE Goals: *Identify all RESTORE Act goals this project supports. Place a **P** for Primary Goal, and **S** for secondary goals.*

- P Restore and Conserve Habitat
- S Restore Water Quality
- S Restore and Revitalize the Gulf Economy
- S Replenish and Protect Living Coastal and Marine Resources
- S Enhance Community Resilience

RESTORE Objectives: *Identify all RESTORE Act objectives this project supports. Place a **P** for Primary Objective, and **S** for secondary objectives.*

- P Restore, Enhance, and Protect Habitats
- S Restore, Improve, and Protect Water Resources
- S Protect and Restore Living Coastal and Marine Resources
- S Restore and Enhance Natural Processes and Shorelines
- S Promote Community Resilience
- S Promote Natural Resource Stewardship and Environmental Education
- S Improve Science-Based Decision-Making Processes

RESTORE Priorities: *Identify all RESTORE Act priorities that this project supports.*

- X Priority 1: Projects that are projected to make the greatest contribution
- X Priority 2: Large-scale projects and programs that are projected to substantially contribute to restoring
- X Priority 3: Projects contained in existing Gulf Coast State comprehensive plans for the restoration ….
- X Priority 4: Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries …

RESTORE Commitments: *Identify all RESTORE Comprehensive Plan commitments that this project supports.*

- X Commitment to Science-based Decision Making
- X Commitment to Regional Ecosystem-based Approach to Restoration
- X Commitment to Engagement, Inclusion, and Transparency
- X Commitment to Leverage Resources and Partnerships
- X Commitment to Delivering Results and Measuring Impacts

RESTORE Proposal Type and Phases: *Please identify which type and phase best suits this proposal.*

___ Project ___ Planning ___ Technical Assistance X Implementation X Program

Project Cost and Duration

Project Cost Estimate:	**$**_____	**Project Timing Estimate**:
Total : Scale 1 $ 10,944,300 (52 acres; Scale 2 $ 15,567,800 (201 acres; Scale 3 $ 17,263,200 (318 acres;	completed by Yr 3) incrementally by Yr 13) incrementally by Yr 21)	Date Anticipated to Start: May 2015 Time to Completion: depends on scale months / years Anticipated Project Lifespan: 50 years

(2) Executive Summary

RESTORATION OF WHOOPING CRANE CRITICAL HABITAT IN TEXAS

The north coast of the Gulf of Mexico is an ideal location to capitalize on existing beneficial use efforts through developing programmatic use of this resource. The project described below, along with others submitted separately for inclusion in the RESTORE Funded Priority List, is intended as a first step and a foundational element toward restoring the value of the Gulf of Mexico to the Nation and the World through programmatic use of dredged material. The Gulfwide benefits of the beneficial use of dredged materials is presented in Section 9.

The proposed habitat restoration project on the central Texas coast would create/restore 318 acres of tidal emergent marsh habitat for the endangered whooping crane (*Grus americana*) by constructing protection and containment structures and creating marsh with maintenance material from the Gulf Intracoastal Waterway (GIWW) at total estimated cost of $17 million for an average cost per acre of $54,000.

Comprehensive Plan Goals: While the primary goal of the proposed project is to Restore Habitat, it would also support all of the other Plan goals. It would provide direct benefits to whooping cranes by enlarging their critical habitat and secondary benefits to other fish and wildlife through improved conditions for submerged aquatic vegetation and the addition of hard substrate for oyster reef. The creation of substantial marsh acreage would improve water quality and coastal zone resiliency in and near the Aransas National Wildlife Refuge (ANWR). The BU plan would benefit maritime commerce on the GIWW and recreation in the ANWR.

Comprehensive Plan Objectives: The primary Comprehensive Plan Objective supported by the proposal is to “Restore, Enhance, and Protect Habitats” by restoring 318 acres of coastal wetland habitat using dredged material. The proposal would restore water resources by increasing marsh filtering capacity and improving water quality. It would protect living coastal resources by enlarging territories for whooping cranes and providing new feeding grounds for this and other species of fish and wildlife. It would enhance natural processes by keeping sediments within the coastal zone, enhancing natural process and bay shorelines. It would promote community resilience by enhancing recreation in the ANWR and maintaining commercial navigation on the GIWW, as completion of the BU plan is necessary to keep the GIWW operating in its current location. Plans for community education and engagement would promote natural resource stewardship and environmental education. Construction of the BUS would also improve science-based decision-making processes by closely monitoring marsh construction and viability and providing resulting data to the scientific community.

Project Implementation: The proposed project would construct stone breakwaters and earthen containment dikes needed to fill and protect 318 acres of salt marsh at three Beneficial Use Sites (BUS A, D, and J), and provide for the filling of BUS D, as well as site contouring, seeding to complete the marsh, and post-construction monitoring at that

location. Filling and marsh creation at BUS A and J, as well as long-term monitoring of all three sites, would be completed incrementally in subsequent years under the USACE Operations and Maintenance (O&M) program.

The project could be implemented at any one of three scales. Scale 1 would provide for completion of protection and containment structures for all three BUS, and the completion of 52 acres of marsh at BUS D at a cost of $10,944,300. Scale 2 would include all Scale 1 activities plus the creation of marsh at BUS J, resulting in a total of 201 acres completed by Year 13 for a total of $15,567,800. Scale 3 would include all of Scale 2 plus the creation of marsh at BUS A, resulting in a total of 318 acres by Year 21 for a total of $17,263,20. Individual cells within each BUS would be completed incrementally. For Scale 3, 16 percent of the total marsh acreage would be complete and contributing to the estuarine system by Year 3, almost 50 percent complete by Year 7, 94 percent complete by Year 15, and 100 percent complete by Year 21. Restoration Council funding would be expended by Year 3 for each scale of construction, as USACE O&M funding (up to $32,471,200) would be leveraged to fund marsh filling in all years beyond the first year of construction.

The proposed project addresses issues identified in the Coastal Texas 2020 Plan (Texas General Land Office [GLO], 2005), contributes to the State's goal to restore coastal marshes presented in GLO's Agency Strategic Plan (GLO and Texas Veterans Land Board, 2012), and contributes to goals of the Coastal Bend and Bays Estuary Program (CBBEP) to maximize benefits of dredging and increase the quantity and quality of habitats and living resources (CBBEP, 1998).

Monitoring and Measures of Success: The BUS would be monitored to ensure the project meets the goal of creating 52 acres of new marsh for BUS D, 149 acres of marsh at BUS J and 117 acres of marsh at BUS A. Success of marsh creation in each BU cell would be measured against performance criteria established in consultation with US Fish and Wildlife Service.

Risk and Uncertainty: Overall project risk is low. Construction risks associated with the types of structures proposed is low and Galveston District has extensive experience with marsh creation using dredged material. The protective breakwaters have been designed to accommodate for the effect of relative sea level rise (RSLR) for over 50 years. Should RSLR be higher than expected, marsh elevation at the BUS could be increased by thin layer placement of dredged material from the GIWW using USACE O&M funds.

(3) PROPOSAL NARRATIVE

1. Proposal Introduction and Background

The proposed habitat restoration project would construct earthen material containment dikes and protective rock breakwaters that would be developed into marsh habitat for the endangered whooping crane *(Grus americana*) by beneficially using maintenance material from the Gulf Intracoastal Waterway (GIWW) on the central Texas coast. While the primary goal of the proposed project is habitat restoration, it would also provide direct benefits to whooping cranes and other living organisms, improve water quality and coastal zone resiliency in and near the Aransas National Wildlife Refuge (ANWR), and benefit maritime commerce and eco-tourism on the Texas Gulf coast.

This section of the GIWW passes through the ANWR and designated critical habitat for the whooping crane. The beneficial use sites (BUS) would replace designated critical habitat for the whooping crane that was lost in the past as a result of GIWW shoreline erosion (USACE 1995). Over 2,000 acres of designated critical habitat have been lost through the construction and operation of the GIWW, primarily from wind and wake erosion. This loss of habitat was addressed by a USACE project that was authorized in 1996 by Public Law 104-303, Section 101(29) and a Record of Decision for the associated Environmental Impact Statement was signed on 3 February 1998 (Section 9).

The USACE Gulf Intracoastal Waterway - Aransas National Wildlife Refuge, Texas project, provided erosion protection for the 12.2 miles of the GIWW through whooping crane critical habitat, spill containment features and equipment to protect the habitat from accidental hazardous spills, and a 50-year beneficial use of dredged material plan which included the creation of 1,614 acres of new marsh/whooping crane habitat over about 35 years. Authorization for the beneficial use plan is provided by the USACE Operations and Maintenance (O&M) program for the GIWW. The habitat restoration project proposed here would provide funding for a part of this marsh creation BU plan. Construction of the 1995 USACE project was begun in 1998 and the erosion control and spill containment features are complete. The marsh creation beneficial use program, however, has had implementation difficulties, and as of this date, construction of only four of nine proposed BUS has been initiated, and none has been completed.

Initial BUS construction included the use of geotextile tubes (geotubes) for protection of containment dikes and all of these have failed. Geotubes have, in fact, been unsuccessful in most applications on the Texas coast. This proposal would replace the tubes with structures known to be more resilient and sustainable in the Gulf coast environment, and build upon the progress made at three BUS (A, D and J). It would

reinvigorate the 50-year beneficial use plan that is essential to restoring lost whooping crane critical habitat in the ANWR by providing containment and erosion protection structures needed for the eventual establishment of 318 acres of new whooping crane habitat. The lessons learned from this project would be foundational in eventual BUS completion and the restoration of 1,614 acres of whooping crane habitat.

The ANWR was specifically established in 1937 to protect the whooping crane on its Texas wintering grounds. The whooping crane was one of the first endangered species designated under the Endangered Species Act (ESA). Due to overhunting, there was only an estimated 500-700 whooping cranes remaining in 1870. By 1937 there were 13 cranes at White Lake, Louisiana and 15 at Aransas, Texas. Recovery of the whooping crane has been difficult due to a low reproductive rate and large territory size needed for each mating pair (135-2,500 acres/pair). As more pairs have established territories on the mainland side of the ANWR, the average size of the territories has decreased, because the offspring upon pairing tend to establish territories adjacent to where they spent their first winter at the ANWR (Stehn and Johnson 1987).

U.S. Fish and Wildlife Service (USFWS) efforts to assist species recovery have been successful, with 304 whooping cranes overwintering in the refuge in 2014. Obtaining the funding to continue the creation of the BUS would increase whooping crane critical habitat and potentially allow for more mating pairs to establish territories. The BUS would also benefit many estuarine species that are dependent on the marsh, such as redfish, shrimp, trout, and blue crab as well as many wading and shore birds that use the marsh for feeding (USACE 1995).

Construction of these BUS would increase critical habitat for the endangered whooping crane. The BUS would become functioning marshes, providing new feeding grounds and territories for the expanding population of whooping cranes at ANWR. The BUS would replace lost critical habitat with new marsh, constructed to provide much needed marsh edge that is utilized by finfish and shellfish as nursery grounds. The BUS would improve water quality and marsh vegetation would filter sediment and increase dissolved oxygen levels.

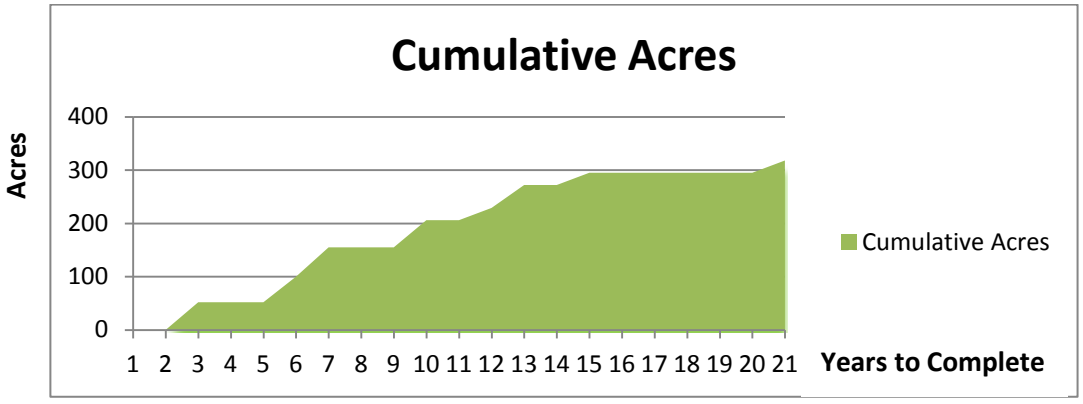
The propose project would enhance natural resource stewardship at ANWR and provide educational outreach. It would contribute to economic sustainability of the region and the GIWW. The BUS would provide locations to place dredged materials from the GIWW that would allow for commerce along the Texas coast to continue uninterrupted. Due to the development of the Eagle Ford Shale formation in South Texas, natural gas and other oil related exports have drastically increased along the ANWR portion of the GIWW, further increasing the GIWW's significance in the local and national economy.

2. Implementation Methodology

The proposed project would construct stone breakwaters and earthen containment dikes needed to fill and protect marsh at three BUS (A, D, and J), and it would provide for the filling of BUS D, as well as site contouring, seeding to complete the marsh, and post-construction monitoring at that location. Filling and marsh creation at BUS A and J would be completed incrementally in subsequent years under the USACE Operations and Maintenance program. The rate at which marsh will be created at BUS A and J is governed by the shoaling rate in this section of the GIWW. This rate is fairly low, resulting in dredging frequencies of approximately 3 years. Given this constraint, marsh will be created incrementally, with almost 50 percent completed and contributing to the overall marsh system by Year 7, 94 percent complete by Year 15, and 100 percent complete by Year 21 (Figure 3-1). Funds being requested from the Restoration Council would be expended by Year 3. A map of the project area is provided in Figure 3-2. The schedule for placement of dredged material at each of the BUS is provided in Table 3-1.

Geotechnical information and core borings , obtained for each BUS area in conjunction with the 1995 USACE study, would be utilized in final design. Erosion at the BUS in the past has been caused by predominately southeasterly winds over long fetches of water during the spring through fall seasons, and somewhat by northeasterly winds in the winter. Plans for the implementation of the erosion protection for the proposed BUS would include placement of articulated mats, containment dikes and stone breakwaters. Details of the BUS are shown on maps provided in Section 4, along with preliminary engineering drawings.

Figure 3-1: Cummulative Acres of Marsh Created Over Time



No real estate would need to be acquired for this project. All work would be conducted in waters of the United States. The maintenance dredging program for the GIWW reach

Figure 3-2: Project Area

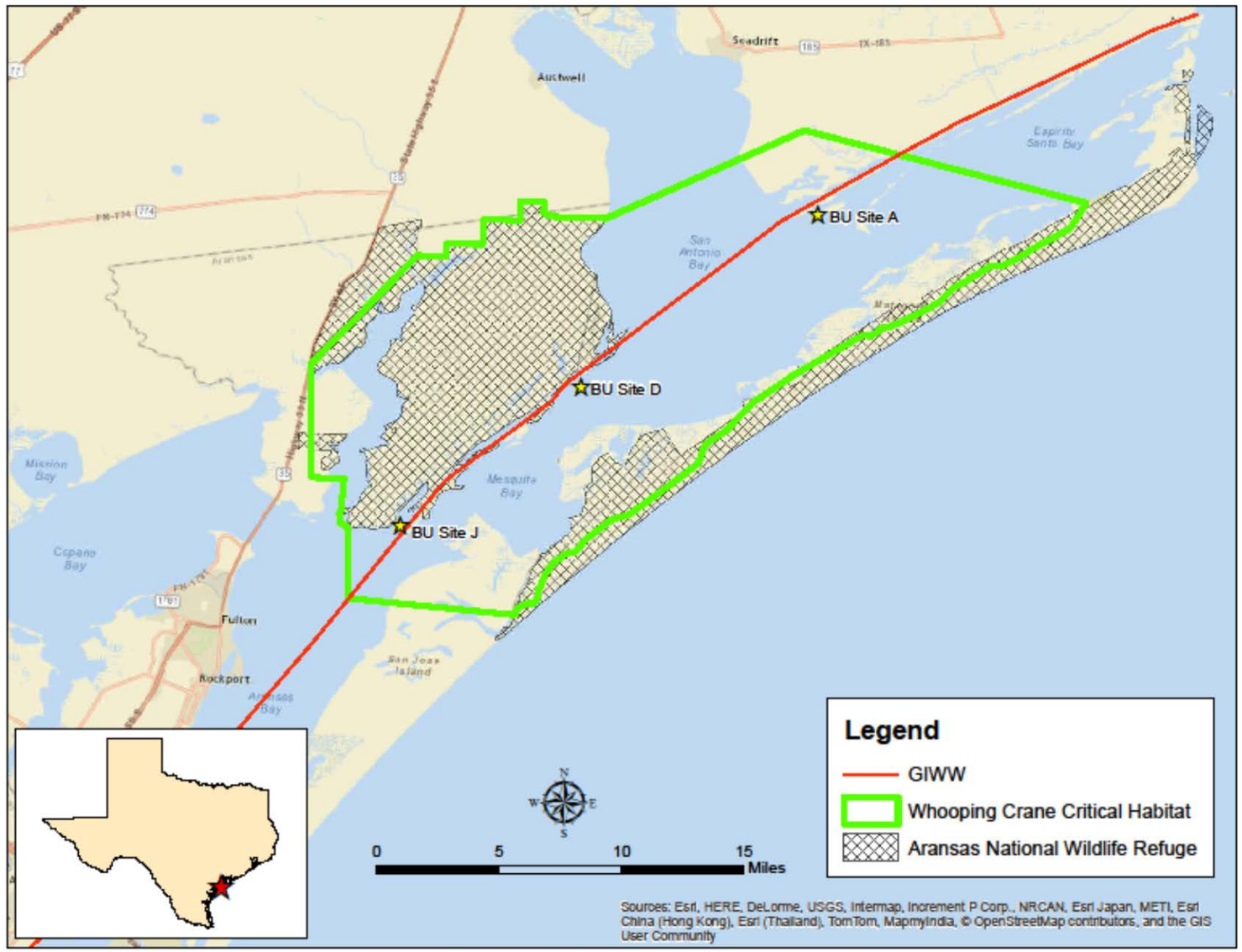


Table 3-1

Dredging Material Placement Schedule for ANWR Beneficial Use Sites A, D, and J

Estimated Maintenance Dredged Material Placement (cubic yards/year)*

GIWW Stationing	Yr1	Yr2	Yr3	Yr4	Yr5	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Total cy/ BUS
BUS A																					
724+000 to 730+000		126,000			126,000			126,000			126,000			126,000			126,000			90,000	1,560,000
730+000 to 735+000		119,000			119,000			119,000			119,000			119,000			119,000				
BUS D																					
765+000 to 785+000	200,000																				350,000
785+000 to 792+000	150,000																				
BUS J																					
825+000 to 832+100			80,000			80,000			10,000												1,070,000
832+100 to 835+000			74,000			74,000			74,000			74,000									
835+000 to 840+000			151,000			151,000			151,000			151,000									
Placement/yr (cy)	**350,000**	**245,000**	**305,000**	**0**	**245,000**	**305,000**	**0**	**245,000**	**235,000**	**0**	**245,000**	**225,000**	**0**	**245,000**	**0**	**0**	**245,000**	**0**	**0**	**90,000**	

*All dredging and placement assumed to begin 15 April and be completed by 01 October of the indicated year in accordance with whooping crane window.

within the ANWR has a navigational purpose and includes as a component this beneficial use of dredged material program. As such, the proposed BUS are associated with the navigation project and support assertion of the navigation servitude.

BUS A

BUS A is located south of the GIWW where it enters San Antonio Bay from the east at Station 728+000. The site is adjacent to Grass Island and the entrance to Shoalwater Bay. The site currently provides approximately 13 acres of marsh in Cell A-1. The average bed elevation in BUS A is - 5.4 feet MLLW and the average elevation of the marsh surface required would be + 0.4 feet MLLW. BUS A has been adequately protected from the southeasterly winds by a stone breakwater that extends from the southeast, however, there has been some damage to the northeast containment dike from northeasterly winds.

It is proposed to construct the containment dikes for three additional marsh Cells (A-3,4,5) east and adjacent to the existing Cell A-2, and enlarge existing Cell A-2 to approximately the same size of Cells A-3-5. The containment dike for the existing Cell A-2 would be repaired and extended. At completion, BUS A would provide a total of 117 acres of marsh. The outer containment dike of Cell A-5 would be armored with concrete cellular mats (CCM's) for protection from winds generated from the northeast. Without the erosion protection, the banks could possibly erode. The existing earthen dike on existing Cell A-2 would be repaired.

A new 100-foot wide access channel would be dredged around the perimeter of the BUS. Under the USACE O&M program, approximately 1,560,000 cubic yards of dredge material from Stations 724+000 to 735+000 would be used to fill the site and construct the marsh, assuming a consolidation rate of 50 percent. Based on expected dredging rates indicated in Table 3-1, filling of all the cells in BUS A would be take 19 years to complete. As cells are completed and after the material has consolidated (about 2 years), USACE O&M funding would be used to contour and create circulation channels within each cell. The cells would then be planted with spartina alterniflora to quickly establish marsh. When the marsh is well established, earthen dikes would be degraded to provide perimeter marine organism access to the new marsh. All work for the proposed action at BUS A is shown on Drawing C-1 in Section 4. Restoration Council funding would provide for construction of the containment dikes, access channel, and the placement of concrete cellular mattress. Dredging and filling of the BU site, circulation channel construction, seeding, monitoring and long-term maintenance would be the responsibility of the USACE O&M program.

BUS D

BUS D is located south of the GIWW and on the south side of upland Placement Area (PA) 128 near Station 788+000, near the center of the ANWR. Some filling has occurred in Cell D-2; however additional material is needed to attain the target marsh elevation. The average bed elevation for this site is - 4.4 feet MLLW and the average elevation of the marsh surface required would be + 0.4 feet MLLW.

The wave exposure of BUS D is similar to that for PA 128. The longest fetches (up to 14 miles) affecting this site are toward the southeast and northeast. The geotube structures protecting the BUS have failed and/or settled resulting in significant damage to the containment dikes along the south and eastern sides of cell D-1.

It is proposed to construct new containment dikes for Cell D-1, fill Cell D-1 and complete the filling of Cell D-2 with dredged material from the GIWW using Restoration Council funding. The site would be readied for BUS construction by removing 5,100 linear feet (LF) of existing damaged geotubes. Once completed, BUS D would provide a total of 52 acres of marsh. Dredge material from Stations 765+000 to 792+000 totaling approximately 350,000 cubic yards would be used to finish filling Cell D-2 and completely fill Cell D-1 in one construction contract. Filling of Cell D-2 would be completed with approximately 50,000 cubic yards of this dredge material. The remaining 300,000 cubic yards of dredge material would be placed in the new marsh Cell D-1 which would be planted, contoured and monitored after the material has consolidated. A 5,100 LF stone breakwater would be constructed on all sides of the BUS D with the exception of the side adjacent to PA 128. This structure would protect this BUS from the impact of wind generated waves from the northeast and southeast. A 3,046 LF existing earthen containment dike will be repaired on the east and south sides of Cell D-2. A new 100-foot wide access channel will be dredged around the perimeter of the BUS D. After the material has consolidated (in about 2 years), each cell would be contoured, planted, and monitored. When the marsh is well established, earthen dikes would be degraded to provide perimeter marine organism access to the new marsh. All work for the proposed action at BUS D is shown on Drawing C-2 in Section 4. Restoration Council funding would provide for all construction (i.e. containment dikes, stone breakwater, access channel, dredging and filling of the site, all post-filling site preparation, and monitoring).

BUS J

BUS J is located at the western end of the ANWR on the north side of the GIWW between stations 832+000 and 840+000. Some filling has occurred in Cell J-1; however additional material and site contouring is needed to attain the target marsh elevation. The average bed elevation in Site J is – 3.5 feet MLLW and the average elevation of the marsh surface required would be + 0.4 feet MLLW.

The site is exposed to long fetches ranging up to 16 miles from the southwest which allow significant wave growth, which has resulted in failure of the southern containment dike of the existing cell J-1. The southern end of the site adjacent to the GIWW needs to be protected from erosion to ensure long-term sustainability, and additional cells need to be constructed at this site for marsh creation.

It is proposed to construct the containment dikes for two additional marsh Cells (J-2 and J-3) northeast and adjacent to the existing Cell J-1. A 4,500 LF stone breakwater would be constructed to provide erosion protection for the southern end of the site adjacent to the GIWW. A new 7,500 LF earthen containment dike would be constructed for the perimeters of Cells J-2 and J-3. A 1,200 LF earthen containment dike on the east side of existing Cell J-1 would be repaired. A new 100-foot wide access channel would be dredged around the perimeter of the BUS. Under the GIWW O&M program, approximately 1,070,000 cubic yards of dredge material from Stations 825+000 to 840+000 would be used to fill the site and construct the marsh, assuming a consolidation rate of 50 percent. Based on expected dredging rates indicated in Figure 1, filling of all the cells in BUS J would take 11 years to complete. After the material has consolidated (in about 2 years), each cell would be contoured, planted, and monitored. When the marsh is well established, earthen dikes would be degraded to provide perimeter marine organism access to the new marsh. At completion, BUS J would provide a total of 149 acres of marsh. All work for the proposed action at BUS J is shown on Drawing C-3 in Section 4. Restoration Council funding would provide for construction and repair of the containment dikes, stone breakwater, and access channel. Dredging and filling of the BU site, circulation channel construction, seeding, monitoring and long-term maintenance would be the responsibility of the USACE O&M program.

Table 3-2: BUS Summary

BU Site	Acreage	Years to Complete
BU Site A	117	21
BU Site D	52	3
BU Site J	149	13

3. Monitoring and Adaptive Management of the Project or Program

The BUS would be monitored to ensure the project meets the goal of creating new marsh for whooping crane wintering habitat. Prior to construction, informal Section 7 consultation would be initiated with the US Fish and Wildlife Service and an interagency monitoring team would be established to develop a monitoring protocol for these BUS. The protocol would include project goals, objectives, performance criteria, monitoring methods and schedule, and potential adaptive management measures. Restoration Council funding would cover the cost of developing the BUS D monitoring program since this BUS marsh would be filled and planted under this project proposal. Post-construction monitoring of BUS A and J would be conducted as the cells in these sites are completed, and long-term monitoring would be conducted at all 3 BUS. Funding for the monitoring effort would be provided by the USACE O&M program. Costs have been estimated based on the assumptions that: 1) the primary monitoring data for evaluating achievement of the ecological success criteria would be aerial photography; and 2) regular site visits would also be conducted to detect the occurrence of undesirable plant species and monitor marsh elevation and circulation. Should seeding be unsuccessful at established the required marsh plant coverage, vegetation planting would be accomplished as an adaptive management measure. Should relative sea level rise (RSLR) be higher than described in Section 5, marsh elevation at the BUS could be increased by thin layer placement of dredged material from the GIWW. The cost of adding more material would likely be minimal because of the continuing need to maintain the GIWW, and the proximity of the GIWW to the BUS. Protective breakwaters, which are the most expensive features to construct, would already be in place. These features are expected to need no maintenance for the first 50 years. Funding for this long-term adaptive management would be provided by the O&M program.

4. Measures of Success for the Proposed Project or Program

- All breakwaters and dikes constructed at the BUS A, D and J would be inspected by USACE during and after construction to ensure they are completed in accordance with plans and specifications.
- Earthen containment dikes constructed for BUS A and J would be rehabilitated prior to use as needed under the O&M dredging and filling contracts.
- Success of marsh creation in each BU cell would be measured against performance criteria established for the monitoring program described in Section 3.

5. Risks and Uncertainties of the Proposed Activities

Relative Sea Level Rise

Current USACE guidance on assessing the impacts of sea level rise on project construction and operation has been utilized in the preparation of this proposal (USACE EC 1100-2-8162, 31 December 2013). The USACE guidance specifies the use of “low”, “intermediate”, and “high” rates of future sea-level change based upon the local historic rate of mean sea level (low) and curves established by the National Research Council (1987) for the intermediate and high rates. RSLR values for the project area were determined to range from a “low” value of 0.87 feet to a “high” rate of 2.65 feet, with an “intermediate” value of 1.3 feet over the next 50 years. Project design will not utilize the low rate because future rates of RSLR are likely to be greater than historic rates. The design will utilize the intermediate and high values based on the considerations discussed below. The potential impacts to marsh elevation of rates closer to the high value will be addressed through adaptive management as described in Section 3.

The existing breakwater at BUS A has been effective at protecting the southeastern and southwestern container dikes in BUS A, but there is some concern on how effective the breakwater would be over the next 50 years. The current height of 1.42 feet MLLW would still effectively reduce wave energies with an intermediate RSLR, but might not adequately dissipate energies if a high RSLR occurred. At the high RSLR, with a maximum tidal range of 0.37 feet above MLLW, the breakwater could be submerged as much as 1.6 feet at maximum high tide. New breakwaters constructed as part of this proposal would have elevations increased at the intermediate 50-year value of 1.3 feet, resulting in a breakwater elevation of 2.75 feet MLLW. This would ensure effective dissipation of wave energies if the high RSLR occurs over fifty years, even at maximum high tide where the structure would only be submerged 0.27 feet.

The containment dikes for the BU marsh sites would not be elevated above the currently proposed + 1.5 feet MLLW. There is not enough construction material available to be mined in these areas to raise the dikes any higher. The dikes are sacrificial and are only needed to establish marshes. Strategically placed breakwaters with the new design elevation should prevent wave energies from eroding established marshes for a 50-year period.

Construction

Construction risks associated with the types of structures proposed is low. Engineering and practice for rock breakwaters, earthen containment dikes and erosion-control matting is well-established, and success proven. However, there remains some uncertainty regarding site conditions.

Soft sediments in some areas may create foundation concerns for containment dikes and rock breakwaters. If not designed properly for these areas, dikes could fail. This risk is mitigated by availability and use of extensive geo-technical boring data in designing these structures, as well as extensive Galveston District experience with these types of structures. There are areas of very soft bay bottom foundation conditions at all three sites, especially BUS D that could result in the weight of stone riprap displacement in to the bay bottom foundation with as much as 30 to 40 percent over runs in rock quantity. The cost estimate includes a standard contingency that would cover overruns in rock quanity.

Storm surge associated with hurricanes and tropical storms poses a threat to breakwaters, dikes and marsh during and after project construction.

Estimates of the quantity of dredged material available for marsh fill have been based on recent observed shoaling rates. Since BUS A and J will take many years to compete, there is a risk that future shoaling rates may differ from the estimates used to predict the marsh completion schedule. Due to this uncertainty, marsh creation may occur faster or slower than predicted.

Environmental

The project is in compliance with the National Environmental Policy Act (NEPA). The Final Environmental Impact Statement (EIS) for the GIWW-Aransas National Wildlife Refuge Project, completed in November 1995, covers the BUS contained in this proposal. This document is too lengthy to attach; an electronic copy is available upon request. The ROD was issued in February 1998 (see Section 9). The BiOp and USFWS Coordination Act Report were finalized in 1995. Compliance with the Clean Water Act, Migratory Bird Treaty Act, National Historic Preservation Act, and others is demonstrated in the EIS. No historic properties will be affected by BUS construction. Compliance updates will be needed in some areas, especially informal consultation with USFWS (as described in Section 6), Coastal Zone Consistency and Essential Fish Habitat consultation. The Texas General Land Office (GLO) manages the Consistency Determination process and they have expressed support for the project. The project will comply with goals of the Texas Coastal Zone Management Plan (Title 31, Part 16, Chapter 501). Completion of this coordination can be accomplished during the final design phase after the project is initiated.

All construction and marsh filling activities must be completed when whooping cranes are in their northern breeding grounds. The window for construction is between 15 April and 1 October of each year. Contracts must be awarded early so that activities can utilize the full window each year.

There are numerous oyster reefs and sea grass beds in the vicinity of proposed BUS. Pre-construction surveys need to be conducted to ensure that significant impacts to these resources are avoided with construction activities. Costs for these surveys and updating of some environmental compliance requirements (specifically Coastal Zone Consistency and Essential Fish Habitat consultation) are included in the Engineering and Design line items.

Tribal

The proposed project would not affect any tribal lands. Nation to Nation consultation will be conducted to determine if there are any tribal concerns resulting from prior Native American use of the area or the presence of nearby archeological sites.

6. Outreach and Education Opportunities

USACE Galveston District Public Affairs Office would announce the start and completion of construction with News Releases.

The BUS are located within the ANWR which is visited annually by tens of thousands of visitors from the U.S. and foreign countries. Pamphlets and posters would be provided to the ANWR Visitor Center that describes the overall project and its funding through the Restoration Council.

USACE would create a Galveston District webpage showcasing the project, its funding from the Restoration Council, and partnerships with USFWS and TXDOT.

Galveston District would provide personnel to assist with field trips for high school and college students interested in Engineering and Sciences to learn about project construction and observe the functionality of the completed BUS cells.

7. Leveraging of Resources and Partnerships

Completion of BUS A and J would leverage Restoration Council funding with USACE O&M program funding to complete filling, site contouring and seeding of the marsh cells. If BUS D and BUS J are constructed (Scale 2 – see Budget Narrative (5)), the USACE O&M contribution is equivalent to approximately 78 percent of Restoration Council funding. If all three BUS are constructed, the USACE O&M contribution is nearly double the requested Restoration Council funding.

Two of the BUS (D and J) are located within the boundaries of the USFWS ANWR and all three are located within whooping crane critical habitat. Therefore, project construction will need to be accomplished in partnership with USFWS. Plans for the

ANWR beneficial use plan were coordinated with USFWS in the 1990's, and the refuge has issued a Compatibility Determination establishing that the BUS are compatible with the purposes for which the refuge was established. USFWS has also issued a Biological Opinion (BiOp) for the project in which the beneficial use areas are identified as conservation recommendations (BiOp available upon request). The BiOp did not identify the BUS as Reasonable and Prudent Measures, and thus their construction is not considered mitigation for erosion impacts associated with the GIWW.

The Texas Department of Transportation (TXDOT) is the non-Federal sponsor for the GIWW in Texas. TXDOT is in full support of and is willing to partner with USACE in establishing a Beneficial Uses Program for Gulf Region as a whole, and with this project proposal for the ANWR. Their letter of support is provided in Section 9.

The Texas GLO has also expressed their support of Gulf Region Beneficial Uses Program. They note that such a program would help to realize effective regional sediment management and directly address the Restoration Council's August 2013 Initial Comprehensive Plan Objective #4 – "to restore and enhance natural process and shorelines." More specifically, they are supportive of the proposed ANWR BUS project. They believe it will provide valuable habitat for the endangered whooping crane and other species that were adversely affected by the Deepwater Horizon Oil Spill. The GLO letter of support is provided in Section 9.

An interagency team will be established to develop a monitoring protocol for these BUS. The protocol would include project goals, objectives, performance criteria, monitoring methods and schedule, and potential adaptive management measures. At a minimum, the following agencies will be invited to participate -USFWS, National Marine Fisheries Service, Natural Resources Conservation Service, Texas Parks and Wildlife, and Texas GLO.

8. Proposal Project/Program Benefits

Construction of these BUS would restore, improve, and protect intertidal marsh and aquatic habitat in and near the ANWR and within the designated critical habitat of the whooping crane. The created marsh would replace lost whooping crane habitat. BUS D and J are located within the Aransas NWR immediately adjacent to existing whooping crane territories. BUS A is located adjacent to Welder Flats on the east side of San Antonio Bay. Enlargement of this habitat would encourage the expansion of established territories for breeding pairs, and improve their foraging range and health. Winter whooping crane surveys have shown that breeding pairs have expanded their geographic extent for their colonies into this area (NRCS 2014).

The additional marsh would filter sediment and increase dissolved oxygen levels, improving water quality. The creation of protective breakwaters for the BUS would also

improve water quality by reducing erosion, while also providing a hard substrate for oyster colonization. The placement of the new marsh islands would create protected shallow areas ideal for the establishment of submerged aquatic vegetation. These created marshes would also provide nursery grounds for coastal resources including finfish, shellfish and other waterfowl. Many fishery species prefer marsh edge, so creation of these free-standing *Spartina alterniflora* marshes with interior circulation should enhance its habitat value and cause a substantial increase in its use by these species (Rozas et al. 1994).

The whooping cranes feed on vegetation such as plant tubers, insects, amphibians, reptiles, small mammals, fish, marine worms, crustaceans, and mollusks, but their primary diet while overwintering in Texas consists of blue crabs (C*allinectes sapidus*) and clams (USFWS 1986). Primary foraging areas for the cranes are in the brackish bays, marshes, and salt flats between the mainland and barrier islands in and around the Aransas NWR (Hunt and Slack, 1989; USFWS 1993). While the creation of these marsh islands would result in an overall loss of shallow, unvegetated subtidal habitat, the area replaced by marsh would be very small compared to the total area of open bay habitat in the vicinity, and salt marsh and seagrass habitats are known to support significantly greater densities of most nekton species than does the subtidal habitat (Rozas, et al. 1994). Furthermore, in a 1997 study by NMFS that compared natural and created wetlands, it was found that natural and created marshes did not differ in species richness of nekton (Minello and Webb 1997).

The construction of the BUS would also improve science-based decision-making processes important to the long term recovery of the Gulf region as a whole. The BUS would be closely monitored to track the development of the marshes and make recommendations for modifying the sites, if needed, to increase viability and to ensure functional equivalency to surrounding marsh (USACE 1995).

Construction of the BUS would also serve to restore and support the economic vitality and enhance the resilience of the Texas Gulf coast region. Restoration of the critical habitat is necessary to adopt the Conservation Recommendations of the USFWS BiOp (USFWS 1993), and thus is necessary to keep the GIWW operating in its current location. Issued for the GIWW-ANWR project, this BiOp permits continued operation of the GIWW through the ANWR if the conditions of the BiOp are met. Closure of the GIWW would have significant economic impacts to the economy of south Texas because the GIWW is essential to local economies. In 1992, 14.4 million tons of commerce was transported on this segment of the GIWW. Due to the development of the Eagle Ford Shale formation in South Texas, natural gas and other oil related exports have drastically increased. In 2008, the formation was producing 2 million cubic feet of natural gas and 352 barrels of oil per day. By early 2013, the formation was producing

1.8 billion cubic feet of natural gas and 468,000 barrels of oil per day. The GIWW in and around the project area is vital to moving oil, natural gas, and petroleum from the production areas in South Texas to refineries and shipping facilities along the Texas Gulf Coast.

The BUS would augment capacity of the existing upland confined placement areas along the GIWW. This would reduce the operating costs of the GIWW as it would delay expenditures necessary to raise containment dikes of existing upland placement areas.

ANWR is a focal point of ecotourism on the Texas coast, with approximately 80,000 visitors per year. Most come for the rich diversity of birds, which includes the endangered whooping crane as well as 392 other bird species, Bird viewing, kayaking, and boat tours are important to the local economy. Replacing lost critical habitat would provide additional areas into which the increasingly crowded crane population can expand, and provide even greater opportunities for ecotourism.

(4) Location Information

Texas Coastal Zone Boundary Map with Project Location

Maps of BUS A, D and J, respectively (Note: latitude/longitude of central points is provided on these figures).

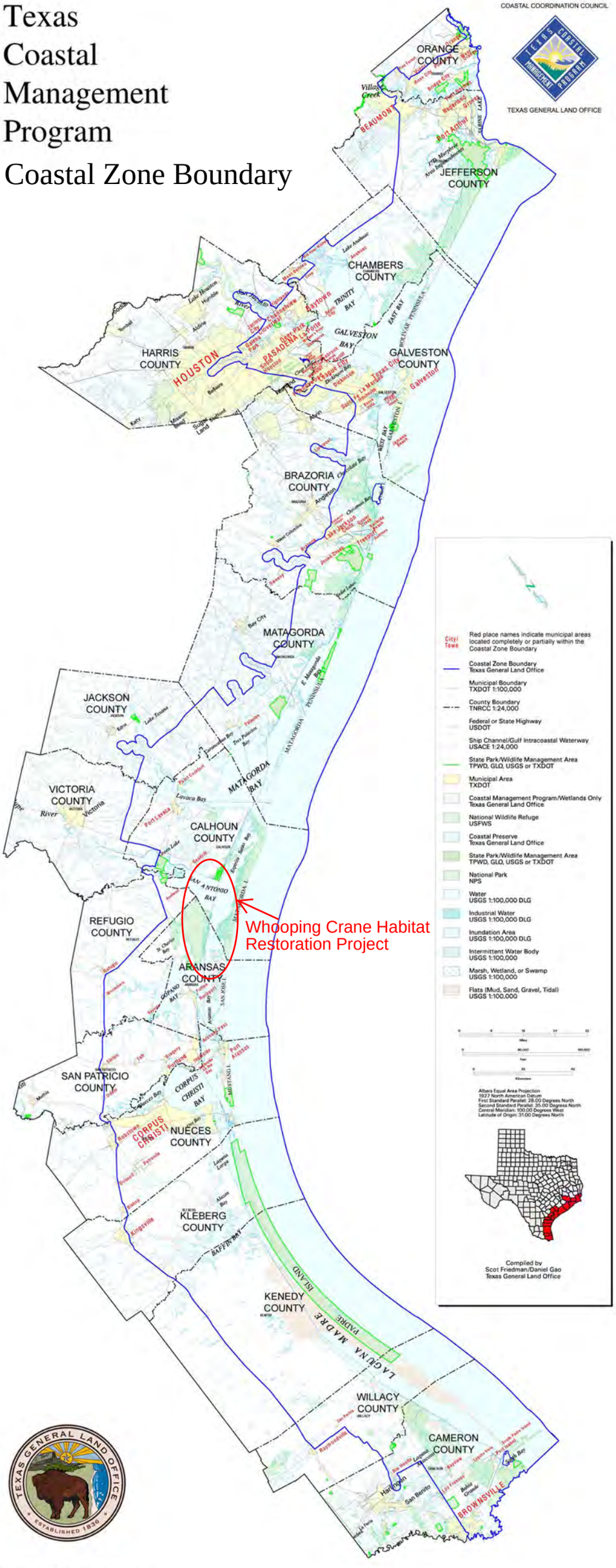
Preliminary Engineering Plans

Texas Coastal Management Program

Coastal Zone Boundary

COASTAL COORDINATION COUNCIL

TEXAS GENERAL LAND OFFICE



TEXAS GENERAL LAND OFFICE ESTABLISHED 1836


PLACEMENT AREA
NO. 121A
726+000
727+000
N
W
E
S
CONCRETE
CELLULAR MATS
CELL 2
CELL 3
CELL 4
CELL 5
BUS "A" (CELL 1)
18.84 ac.
BREAKWATER
BREAKWATER
EXISTING ROCK WEIR TO BE
COVERED OR REMOVED
BENEFICIAL USE SITE A
Latitude 28.317
Longitude -96.652
0
500
1,000
1,500
Feet
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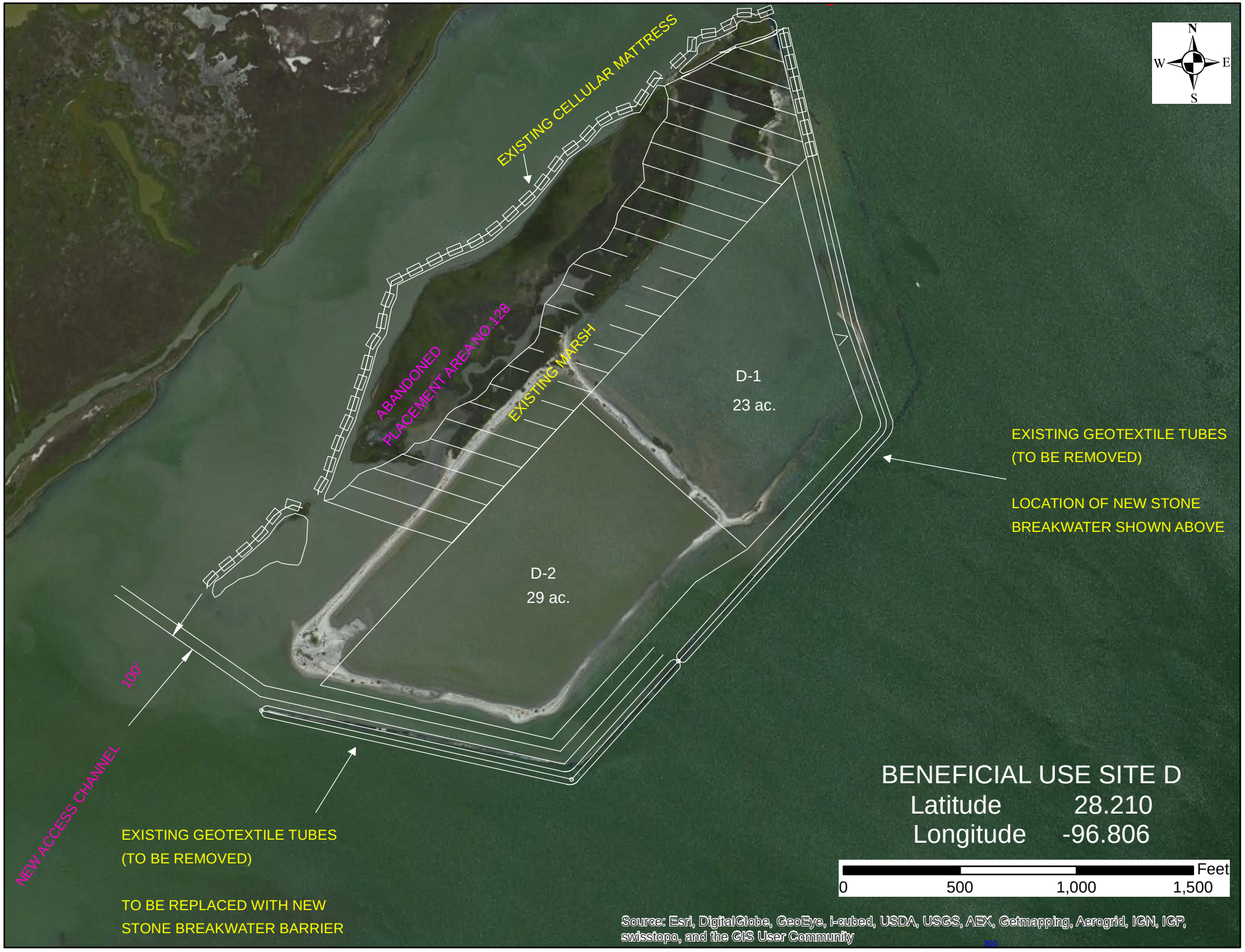
N
W
E
S
EXISTING CELLULAR MATTRESS
ABANDONED PLACEMENT AREA NO.128
EXISTING MARSH
D-1
23 ac.
D-2
29 ac.
EXISTING GEOTEXTILE TUBES
(TO BE REMOVED)
LOCATION OF NEW STONE
BREAKWATER SHOWN ABOVE
100'
NEW ACCESS CHANNEL
EXISTING GEOTEXTILE TUBES
(TO BE REMOVED)
TO BE REPLACED WITH NEW
STONE BREAKWATER BARRIER
BENEFICIAL USE SITE D
Latitude 28.210
Longitude -96.806
Feet
0
500
1,000
1,500
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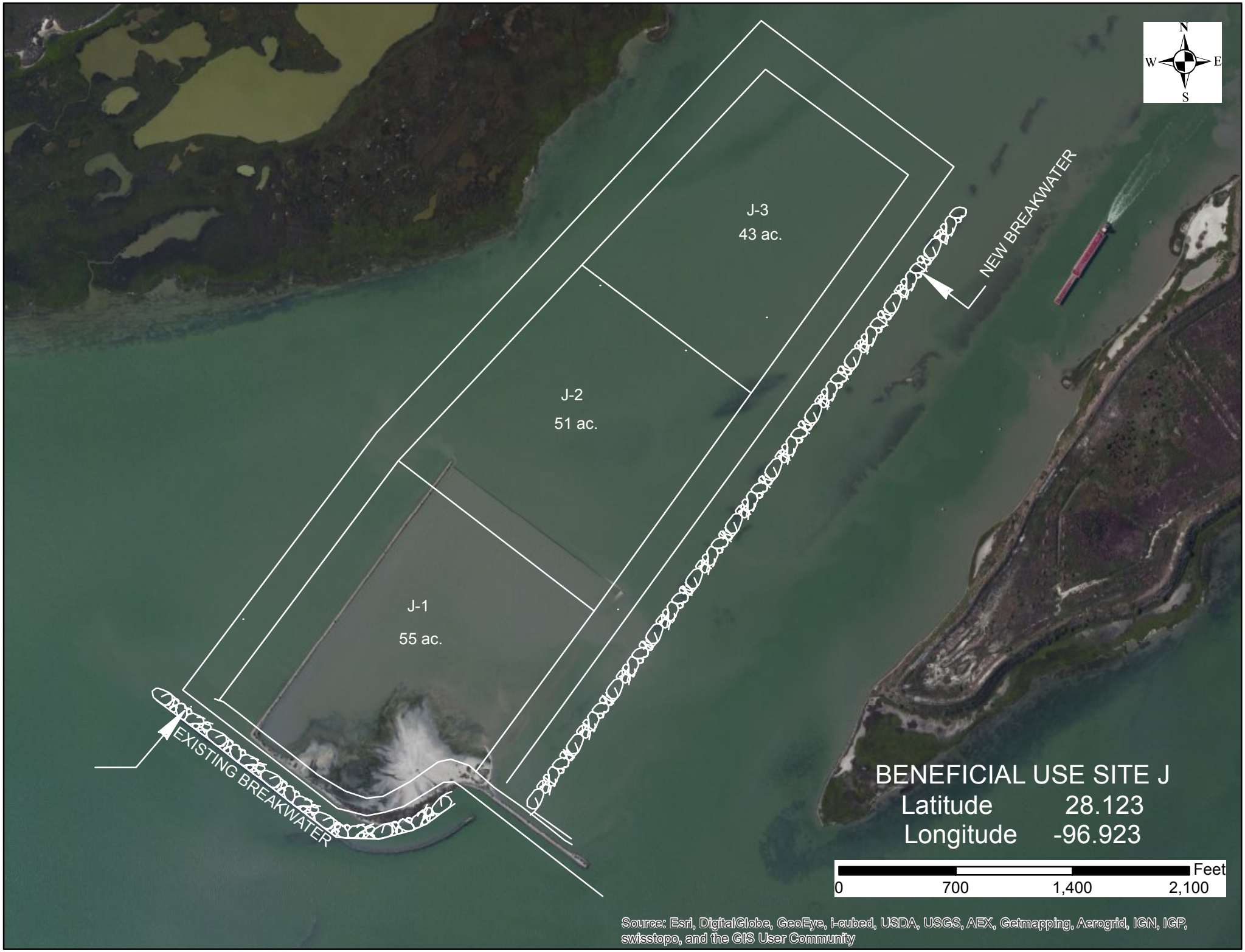
N
W
E
S
J-3
43 ac.
J-2
51 ac.
J-1
55 ac.
NEW BREAKWATER
EXISTING BREAKWATER
BENEFICIAL USE SITE J
Latitude 28.123
Longitude -96.923
Feet
0
700
1,400
2,100
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

GULF INTRACOASTAL WATERWAY, TEXAS

ANWR BUS A, D AND J
MARSH CREATIONS

CONSTRUCTION

Coastal Navigation and Environmental Restoration

Office of the District Engineer
U. S. Army Engineer District, Galveston
Corps of Engineers
Galveston, Texas
October 2014

GALVESTON DISTRICT

TOTAL
ARMY
QUALITY

This project was designed by the Galveston District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

SOLICITATION NO.
FILE NO. IWW

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BY:M3ECXBRH DATE:10/8/2014 TIME:2:17:42 PM

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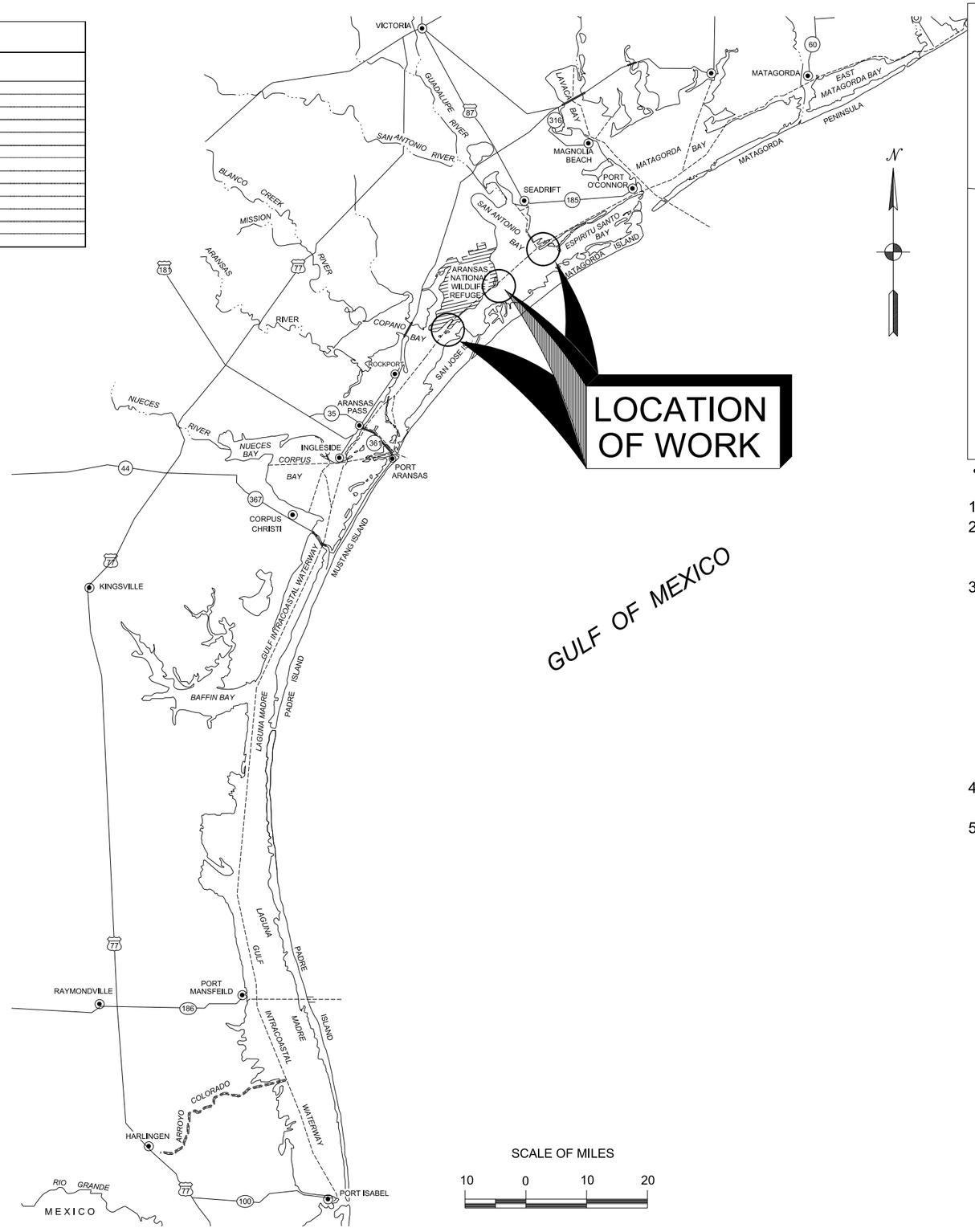
INDEX OF DRAWINGS

SHEET # of 4	DWG. NO.	TITLE
		GENERAL
		COVER SHEET
1	G-1	LOCATION PLAN AND INDEX OF DRAWINGS
		CIVIL-SITE
		BUS "A"
2	C-1	PLAN AND TYPICAL SECTION - BUS "A"
		BUS "D"
3	C-2	PLAN AND TYPICAL SECTION - BUS "D"
		BUS "J"
4	C-3	PLAN AND TYPICAL SECTION - BUS "J"
4	*4*	*-- Total Number of Drawings*



GENERAL NOTES

1. ELEVATIONS ARE REFERENCED TO NAVD 88, IN FEET.
2. HORIZONTAL CONTROL IS REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, NAD 83, TEXAS SOUTH-CENTRAL ZONE, U.S. SURVEY FEET.
3. THE CONTRACTOR SHALL BE ALLOWED TO MECHANICALLY EXCAVATE WITHIN SITE ACCESS ROUTE SHOWN ON SHEET C-01 AND ADJACENT TO THE BREAKWATER WITHIN THE SITE TO ALLOW MOVEMENT OF EQUIPMENT AND PERFORM CONSTRUCTION OPERATIONS FOR WORK UNDER THIS CONTRACT, HOWEVER, ACCESS CHANNELS SHALL NOT BE CLOSER THAN 30 FEET FROM THE TOE OF THE NEW STONE BREAKWATER. SEE SPECIFICATIONS FOR ADDITIONAL RESTRICTIONS AND DETAILS.
4. NO LAND ACCESS TO THE SITE IS AVAILABLE, ACCESS SHALL BE VIA THE GULF INTRACOASTAL WATERWAY.
5. THE WORK SITES ARE WITHIN THE BOUNDARIES OF THE WHOOPING CRANE CRITICAL HABITAT. ALL WORK IS TO BE PERFORMED SUBJECT TO THE RESTRICTIONS LISTED IN THE SPECIFICATIONS.

This project was designed by the Galveston District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

SOLICITATION NO. W9126G-00-X-0000

U.S. Army Corps of Engineers
Galveston District

No.	Description	Date	By

Drawn by:	D.C.	Date: SEPT. 2014
Designed by:	C.C.	Scale: AS SHOWN
Checked by:		
Submitted by:		Approval Recommended:
LORI K. THOMAS, P.E. Chief, Geotech/Structure Section		JOSEPH L. KING, P.A. Chief, Engineering Branch
Approved by:		TERRY F. BAUTISTA, P.E. Chief, Engineering and Construction Division

U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF
RICHARD P. PANNELL, COL, C.E.,
DISTRICT COMMANDER

GULF INTRACOASTAL WATERWAY, TEXAS
ANWR BUS A, D AND J
MARSH CREATION
CONSTRUCTION

LOCATION PLAN
AND
INDEX OF DRAWINGS

Drawing No.:
G-1
Sheet 1 of 1
File No. xxx XXX-XXX

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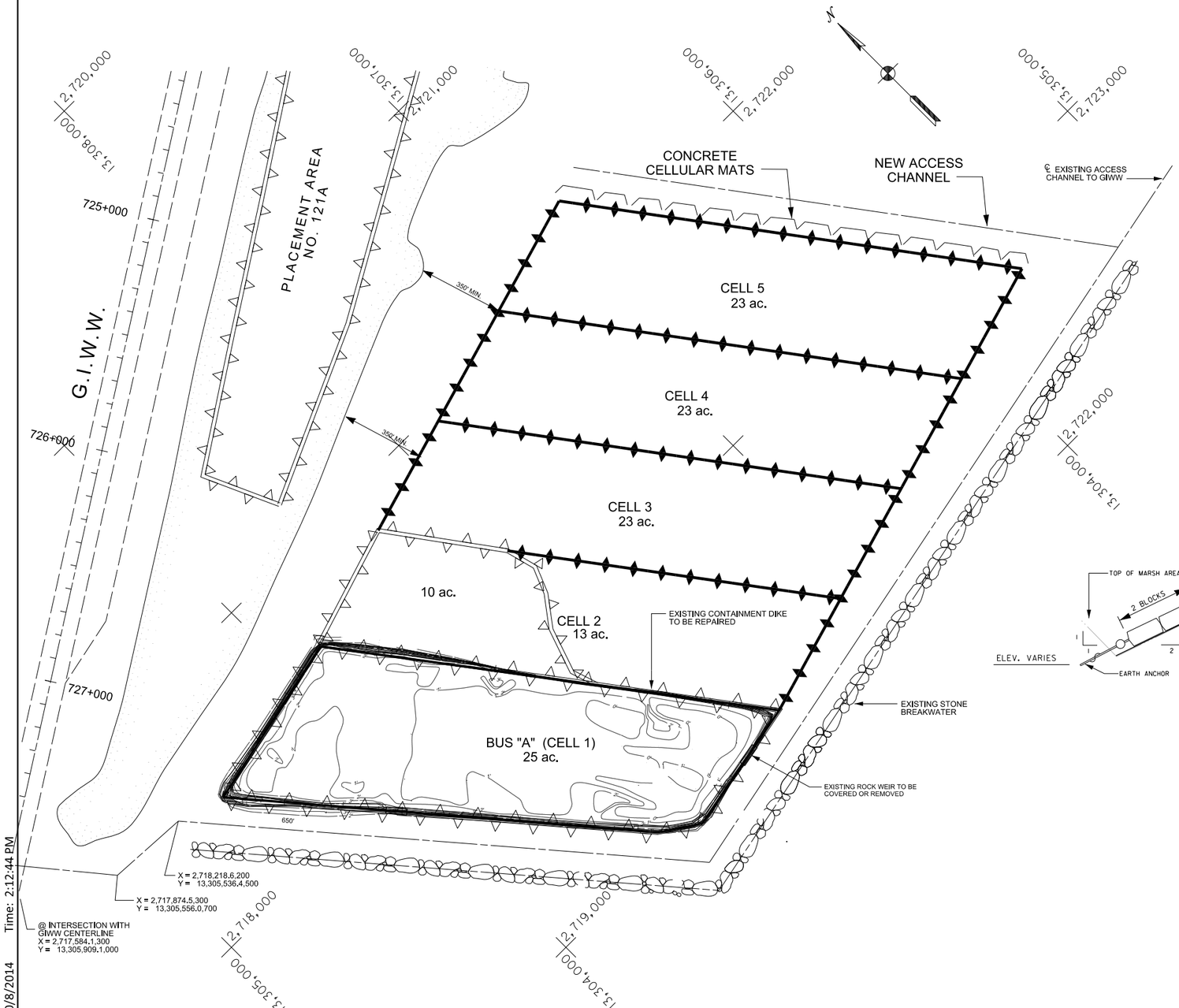

PLAN

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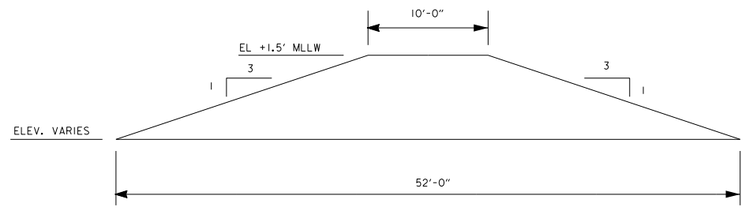
SCALE IN FEET



TYPICAL CONTAINMENT DIKE SECTION

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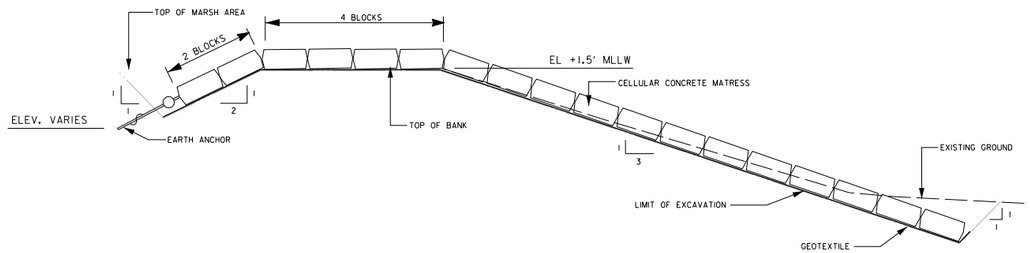

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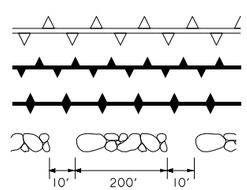

EXISTING CONTAINMENT DIKE

EXISTING CONTAINMENT DIKE TO BE REPAIRED

NEW CONTAINMENT DIKE TO BE CONSTRUCTED

NEW STONE BREAKWATER TO BE PLACED

U.S. Army Corps of Engineers
Galveston District

	By	Date	Description	Rev.

Drawn by: D.C.
Designed by: C.C.
Checked by:
Submitted by: LORI K. THOMAS, P.E. Chief, Navigation Structure Section
Approved by: TERRY F. BAUTISTA, P.E. Chief, Engineering and Construction Division
Date: SEPT. 2014
Scale: AS SHOWN
Approval Recommended: JOSEPH L. KING, R.A. Chief, Engineering Branch

U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF
RICHARD P. PANNELL, COL., C.E.,
DISTRICT COMMANDER

GULF INTRACOASTAL WATERWAY, TEXAS
ANWR BUS A, D AND J
MARSH CREATION
CONSTRUCTION

PLAN AND TYPICAL SECTION
BUS "A"

Drawing No.:
C-1
Sheet 2 of 4
File No. xxx XXX-XXX

SOLICITATION NO.
W9126G-00-X-0000

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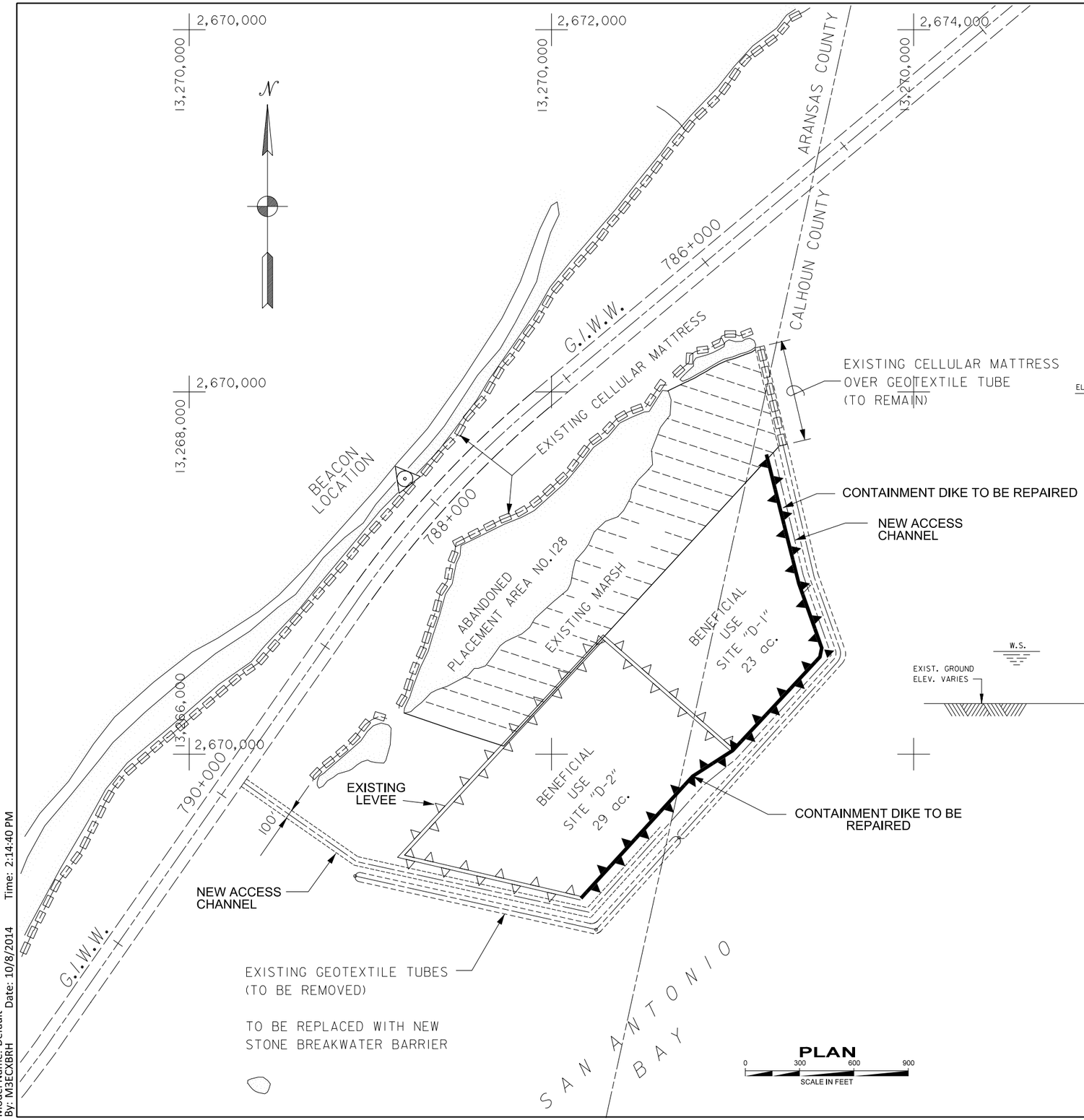

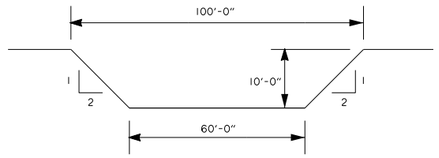

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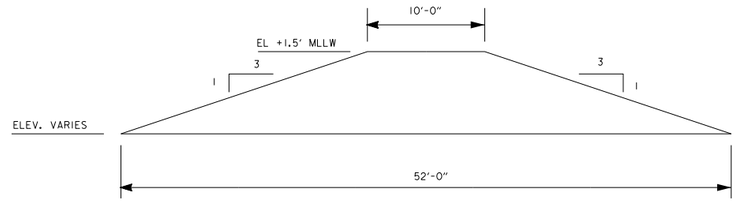

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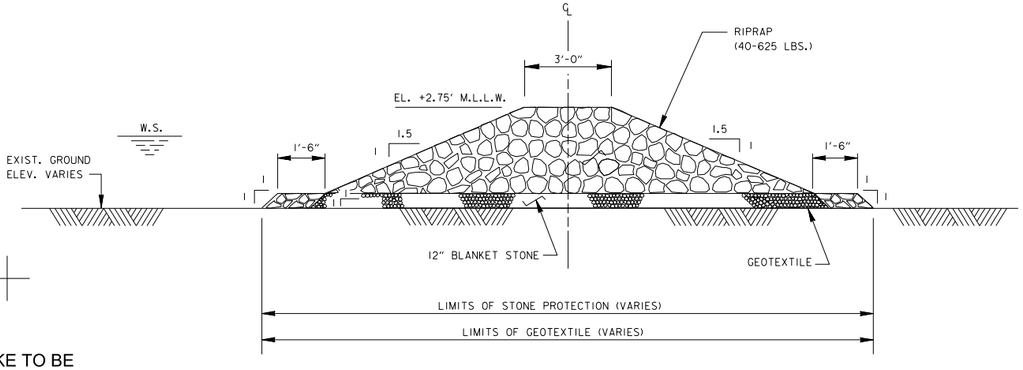

TYPICAL SECTION
STONE BREAKWATER AT BUS "D"

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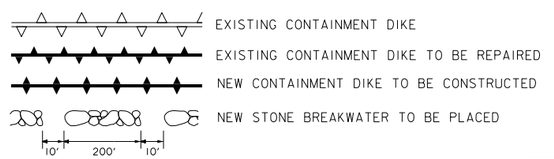

U.S. Army Corps of Engineers
Galveston Distrfct

Rev.	Description	Date	By

Drawn by: D.C.
Designed by: C.C.
Submitted by: LORI K. THOMAS, P.E.
Chief, Coastal Structure Section
Approved by: TERRY F. BAUTISTA, P.E.
Chief, Engineering and Construction Division
Date: SEPT. 2014
Scale: AS SHOWN
Approval Recommended: JOSEPH L. KING, R.A.
Chief, Engineering Branch

U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF
RICHARD P. PANNELL, COL., C.E.
DISTRICT COMMANDER

GULF INTRACOASTAL WATERWAY, TEXAS
ANWR BUS A, D AND J
MARSH CREATION
CONSTRUCTION

PLAN AND TYPICAL SECTION
BUS "D"

Drawing No.:
C-2
Sheet 3 of 4
File No. xxx XXX-XXX

SOLICITATION NO.
W9126G-00-X-0000

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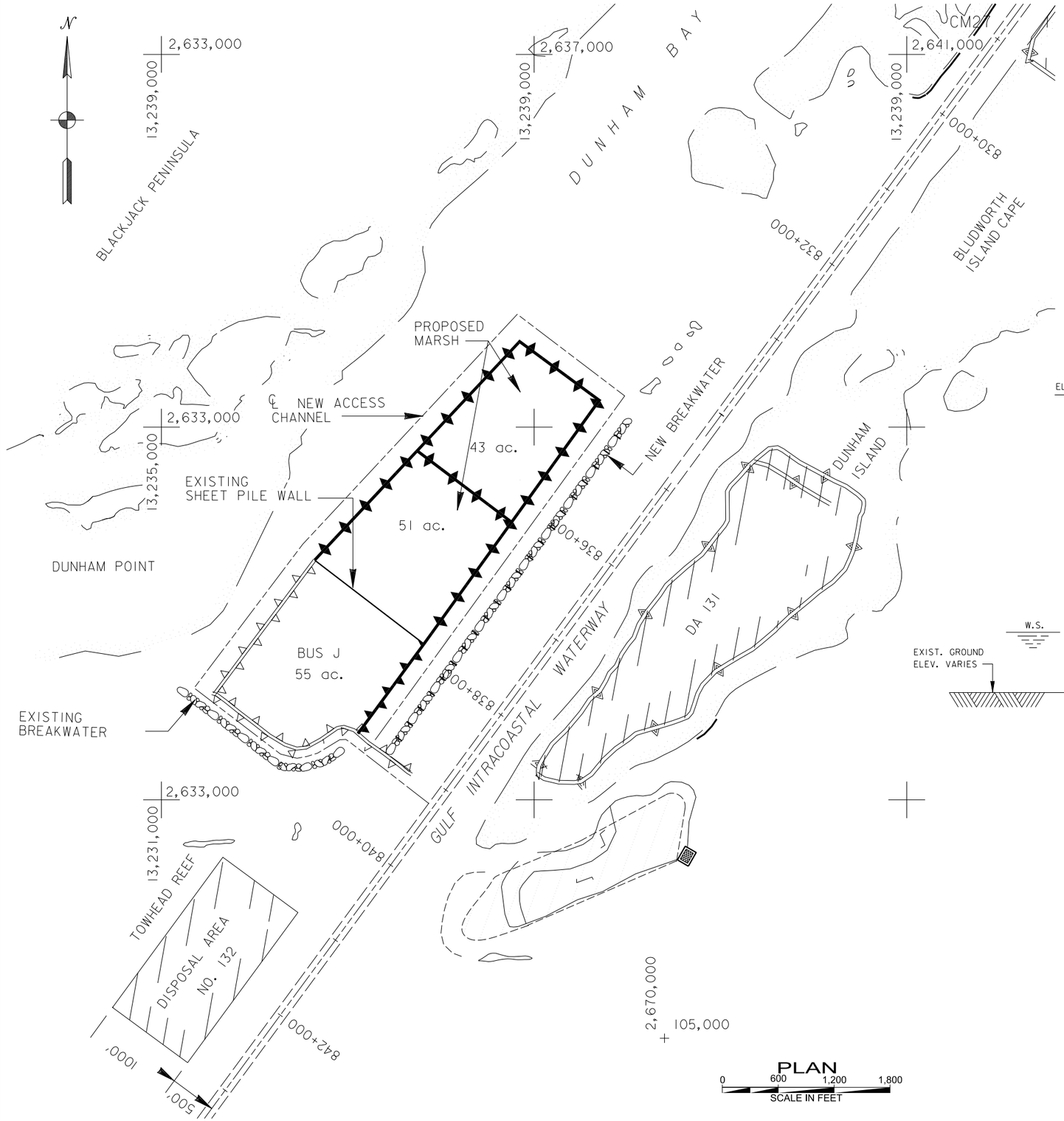

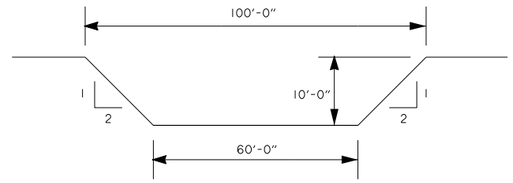

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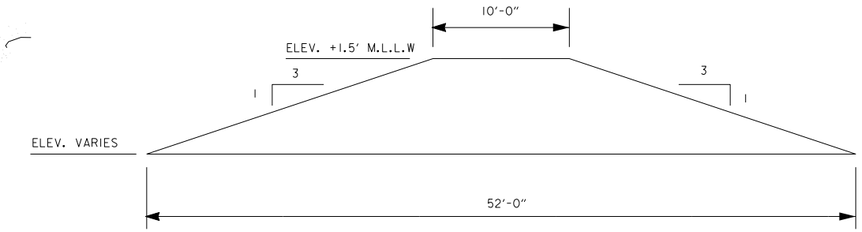

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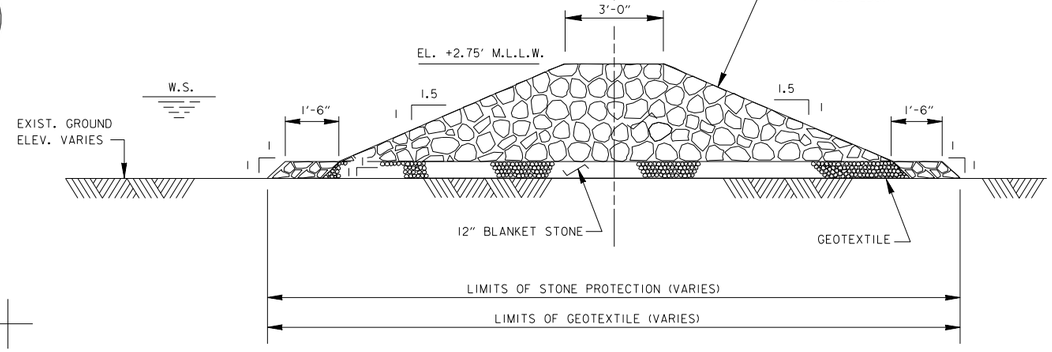

TYPICAL SECTION STONE BREAKWATER AT BUS "J"

N.T.S.

LEGEND:

- EXISTING CONTAINMENT DIKE
- EXISTING CONTAINMENT DIKE TO BE REPAIRED
- NEW CONTAINMENT DIKE TO BE CONSTRUCTED
- NEW STONE BREAKWATER TO BE PLACED

10' 200' 10'

SOLICITATION NO. W9126G-00-X-0000

U.S. Army Corps of Engineers
Galveston District

	Rev.	Date	By	Description

Date: SEPT. 2014
Scale: AS SHOWN
Approval Recommended:
JOSEPH L. KING, R.A.
Chief, Engineering Branch

Drawn by: D.C.
Designed by: C.C.
Checked by:
Submitted by: LORI K. THOMAS, P.E.
Chief, Geotech/Structure Section
Approved by: TERRY F. BAUTISTA, P.E.
Chief, Engineering and Construction Division

U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF
RICHARD P. PANNELL, LCDR, C.E.,
DISTRICT COMMANDER

GULF INTRACOASTAL WATERWAY, TEXAS
ANWR BUS A, D AND J
MARSH CREATION
CONSTRUCTION

PLAN AND TYPICAL SECTIONS
BUS "J"

Drawing No.:
C-3
Sheet 4 of 4
File No. xxx XXX-XXX

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(5) High-Level Budget Narrative

The cost estimate presented in Table 5-1 is divided into two cost streams. Restoration Council Project Costs include construction costs for breakwaters, containment dikes, cellular concrete matting, dredging of construction access channels BUS A, D and J. Restoration Council funding would be expended by the end of Year 3, covering the construction of all containment and erosion protection structures at all 3 BUS, and for BUS D, also included are all costs to create marsh at this site (GIWW dredging, laying and movement of hydraulic pipelines as needed, site contouring to create circulation channels, spartina seeding, and post-construction monitoring). USACE O&M program costs for BUS A and J include GIWW dredging, laying and movement of hydraulic pipelines as needed, site contouring to create circulation channels, spartina seeding, and post-construction and long-term monitoring to ensure ecological success of all 3 BUS. No O&M costs are anticipated for BUS D because the marsh would be filled, completed and monitored with Restoration Council funding, and no significant O&M costs are anticipated to maintain the breakwater or marsh.

The project could be funded by the Restoration Council at any one of three different scales as shown in Table 5-2. The Council could choose to fund Scale 1 (completion of BUS D through establishment of 52 acres of marsh and post-construction monitoring) at a cost of $10,944,300. Scale 1 could be completed within three years of funding. Or, the Council could choose to fund Scale 2 (BUS D and J) for $15,567,800. Scale 2 would construct 201 acres of marsh to be completed within 13 years of funding. This scale would leverage Restoration Council funds with $12,234,100 of USACE O&M funding. Or the Council could choose to fund Scale 3 (BUS D, J and A) at a total cost of $17,263,200. Scale 3 would construct 318 acres of marsh within 21 years of funding, and leverage $32,471,200 of USACE O&M funding.

Table 5-1
Aransas National Wildlife Refuge Beneficial Use Sites A, D and J
High-Level Cost Estimate
(October 2014 Price Level)

	Restoration Council Project Cost		USACE O&M Cost
BU Site A	Construction Cost	$ 1,412,700	
	Eng & Design	$ 169,600	
	Const Mngt	$ 113,100	
	Total:	$ 1,695,400	$ 20,237,100
BU Site D	Construction Cost	$ 9,120,300	
	Eng & Design	$ 1,094,400	
	Const Mngt	$ 729,600	
	Total:	$ 10,944,300	0
BU Site J	Construction Cost	$ 3,852,800	
	Eng & Design	$ 462,400	
	Const Mngt	$ 308,300	
	Total:	$ 4,623,500	$ 12,234,100

Table 5-2 Potential Scales of Construction

	Activity	Total Acres	Years to Complete	Restore Act Funds	USACE O&M Funds
Scale 1	Complete breakwaters and earthen containment dikes at BUS A, D and J; dredging, filling and contouring marsh at BUS D	52	3	$10,944,300	0
Scale 2	Scale 1 plus dredging, filling, and contouring of BUS J	201	13	$15,567,800	$12,234,100
Scale 3	Scale 2 plus dredging, filling, and contouring of BUS A	318	21	$17,263,200	$32,471,200

Appendix B

Gulf Coast Ecosystem Restoration Council
Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

Environmental Compliance Type	**Yes**	**No**	**Applied For**	**N/A**
Federal				
National Marine Sanctuaries Act (NMSA)				X
Coastal Zone Management Act (CZMA) [Project predates TX CZMP - will complete]		X		
Fish and Wildlife Coordination Act [Final CAR 13 Oct 1995]	X			
Farmland Protection Policy Act (FPPA)				X
NEPA – Categorical Exclusion				X
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement [Final EIS Nov 1995; ROD 1998]	X			
Clean Water Act – 404 – Individual Permit (USACOE)				X
Clean Water Act – 404 – General Permit(USACOE)				X
Clean Water Act – 404 – Letters of Permission(USACOE)				X
Clean Water Act – 401 – WQ certification	X			
Clean Water Act – 402 – NPDES				X
Rivers and Harbors Act – Section 10 (USACOE)	X			
Endangered Species Act – Section 7 – Informal and Formal Consultation (NMFS, USFWS)	X			
Endangered Species Act – Section 7 - Biological Assessment (BOEM,USACOE)	X			
Endangered Species Act – Section 7 – Biological Opinion (NMFS, USFWS)	X			
Endangered Species Act – Section 7 – Permit for Take (NMFS, USFWS)				X
Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) – Consultation (NMFS) [Project predates EFH reqmt - will complete]		X		
Marine Mammal Protection Act – Incidental Take Permit (106) (NMFS, USFWS)				X
Migratory Bird Treaty Act (USFWS)	X			
Bald and Golden Eagle Protection Act – Consultation and Planning (USFWS)				X
Marine Protection, Research and Sanctuaries Act – Section 103 permit (NMFS)				X
BOEM Outer Continental Shelf Lands Act – Section 8 OCS Lands Sand permit				X
NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s)	X			
NHPA Section 106 – Memorandum of Agreement/Programmatic Agreement				X
Tribal Consultation (Government to Government) [will complete]		X		
Coastal Barriers Resource Act – CBRS (Consultation)	X			
State				
As Applicable per State				X

(7) Data/Information Sharing Plan

Data to be collected by USACE during this project would include:

- Construction monitoring data (shoaling rates, quantities pumped, material type, consolidation rate, resulting marsh elevation)
- Post-construction monitoring data (marsh elevation, percent cover)
- Long-term monitoring (marsh elevation, percent cover, types of vegetation present)

USFWS could provide observational data on use by whooping cranes and other bird species

Data would be shared by posting to USACE and potentially ANWR websites.

(8) References

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(9) **Other**

Gulfwide Beneficial Use of Dredged Material

Powerpoint presentation – Whooping Crane Habitat Restoration in Texas

ROD (February 3,1998)

TxDOT Letter of Support (October 6, 2014)

Tx GLO Letter of Support (October 6, 2014)

GULFWIDE BENEFICIAL USE OF DREDGED MATERIAL

During the last three decades of the 20th century, the standard perception was that dredged material was "spoil" or waste material that had no value or needed to be handled as a pollutant. However, as we move into the beginning of the 21st century, issues such as sea level rise, subsidence, loss of habitat, development, and pervasive storm damage in coastal areas has changed that perception. Most coastal managers now recognize that dredged material is frequently uncontaminated, and should be used as a resource to compensate for coastal erosion, to nourish beaches, to build habitat, and to return areas that have subsided below sea level back to an elevation within the tidal range.

While the function or value of individual beneficial use projects may be only local in scope, for instance, a new wetland area may help protect a particular stretch of levee around a small community, restore a section of critically eroded beach, or provide habitat for a specific population of estuarine organisms, cumulatively, multiple beneficial use projects across a wide geographic area could significantly offset coastal wetland loss, provide nursery areas or other habitats for important commercial species or species of concern such as sea turtles and neotropical migrants and minimize salt water intrusion by reestablishing estuarine boundaries through construction of spits and barrier islands.

The northern coast of the Gulf of Mexico is an ideal location to augment existing beneficial use efforts that are based only on individual projects and elevate them to a programmatic effort. The need and feasibility of a programmatic beneficial use program in the northern Gulf is due to the natural and man-made stresses on the coastal environment experienced in the recent decade, resulting in considerable habitat and wetland loss with subsequent impact on marine and coastal resources, and increase in water quality issues, which may be offset by the proximity of many authorized Federal navigation channels that are dredged on a regular basis as well as local or privately maintained channels, thus providing substantial quantities of materials for use.

The coastal region of the northern Gulf of Mexico owes its current landscape structure to an array of tectonic, erosional and depositional, climatic, geochemical, hydrological, ecological, and human processes that have resulted in some of the world's most complex, dynamic, productive, and threatened ecosystems (Brock et al. 2013). These ecosystems and the resources they support are vulnerable to man-made and natural events. Improving the resiliency of these ecosystems is a critical component of restoring the Gulf of Mexico as a whole.

Following the Deepwater Horizon oil spill, an assessment of the most pressing challenges facing the Gulf of Mexico ecosystem described the following (Mabus 2010):

- *Loss of wetland habitats, including coastal marshes, forested wetlands, barrier islands, and coastal shorelines that form the Mississippi River Delta and Chenier Plains*.

- *Erosion of barrier islands and shorelines throughout the Gulf Coast.*
- *Loss and degradation of coastal estuarine habitat.*
- *Imperiled fisheries.*
- *Hypoxia (low oxygen) in the Gulf of Mexico.*
- *Climate change.*

Sediment, delivered by the Gulf river systems, built much of the Gulf Coast and continues to be essential to the health of the Gulf ecosystem. Accordingly, the Gulf Coast Ecosystem Restoration Task Force proposed a sediment management approach to address land loss through sustainable resource management and land building and restoration. The 2011 Gulf of Mexico Regional Ecosystem Restoration Strategy (GCERTF 2011) recommended 3 actions, two of which are related to dredged material:

- Maximize beneficial use of navigational dredged material, where practicable and ecologically acceptable, for effective and sustainable habitat restoration.
- Increase dedicated dredging of river and other sediment sources, such as permitted offshore sediment shoals, for use in habitat restoration projects.

Beneficial use is defined as the productive use of material produced during the authorized maintenance dredging of navigation channels. Dedicated dredging on the other hand, while having the same purpose, does not have the same required link with authorized navigation dredging.

Combined, the four Gulf Coast Corps Districts (Galveston, New Orleans, Mobile, and Jacksonville) dredge approximately 123 million cubic yards from coastal Federal navigation projects on an annual basis[1]. Approximately 22 million cubic yards of this material is used beneficially as the least cost placement option or when a local sponsor is able to contribute funds to cover the incremental of the more costly beneficial use option. In addition, suitable sediments are found in upland disposal areas along several Federal inland river systems.

Navigation in the Gulf Coast region will continue to require dredging, and the implementation of projects that use dredge material to restore coastal habitats will provide a cornerstone for coastal ecosystem restoration in the Gulf region. Sediment delivered by the many rivers draining into the Gulf is essential to the health of the Gulf Coast ecosystem. One component of a strategic approach to sediment management is maximizing the beneficial use of dredge material, where ecologically acceptable, for effective and sustainable habitat restoration. By beneficially utilizing dredge material to create coastal wetlands, the project will restore habitat.

The northern coast of the Gulf of Mexico is an ideal location to augment existing beneficial use efforts that are based only on individual projects and elevate them to a programmatic effort. The project described below, along with others submitted separately for inclusion in the RESTORE Funded Priority List is intended as a first step and a foundational element toward restoring the value of the Gulf of Mexico to the Nation and the World.

USACE – Galveston District:
"Texas Coastal Custodians"

Whooping Crane Habitat Restoration in Texas

FPL Proposal Prepared October 2014

U.S.ARMY

US Army Corps of Engineers

BUILDING STRONG®

Project Proposal

Project Proposal:

Restoration of whooping crane critical habitat on central Texas coast with the beneficial use of dredged material from the GIWW

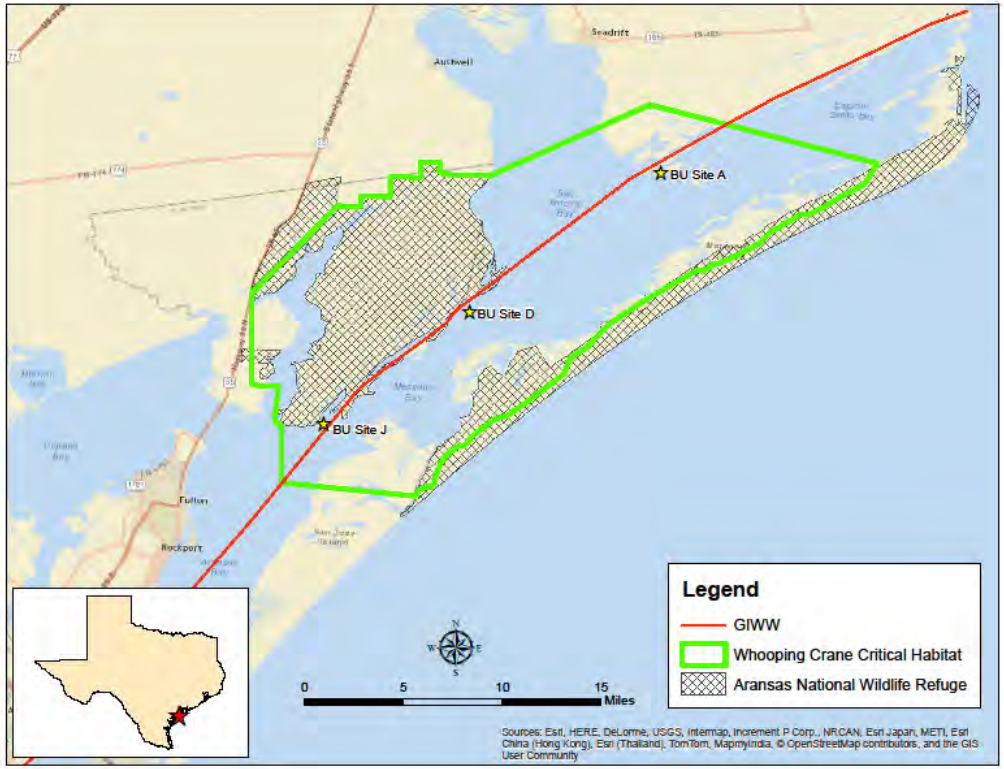
GIWW-Aransas NWR Project (1996)

GIWW passes through ANWR and designated wintering whooping crane critical habitat

Wind and wake erosion have resulted In loss of over 2,000 acres of habitat since GIWW was constructed

This loss was addressed by USACE project authorized in 1996 by P.L. 104-303, Section 101(29) with ROD dated 3 Feb 1998

USACE project provided erosion protection for 12.2 mi of GIWW, spill containment features, and a 50-yr BUDM plan for creation of 1,614 acres of new marsh



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Relationship of New Proposal to 1996 BUDM Plan

Authorization for the ANWR BUDM plan provided by USACE O&M authority for GIWW

Construction has begun on only 4 of 9 proposed beneficial use sites (BUS) and none have been completed.

Initial construction utilized geotubes which have failed in nearly every application

Proposal would replace geotubes with rock breakwaters and restore/enlarge 3 BUS sites (A, D and J) resulting in creation of 318 acres of new marsh

BUS A

Restoration Council funds:

Construction of new and repair of existing earthen containment dikes for 5 cells

Installation of concrete cellular mats on exposed eastern side of Cell 5

USACE O&M Program funds:

Filling with GIWW dredged material to create total of 117 acres of marsh

Site contouring/circulation channel construction/planting

Monitoring plan

Completed within 22 yrs of initiation

BUS D

Restoration Council funds:

Removal of existing degraded geotubes

New stone breakwater for erosion protection

Construction of new and repair of existing earthen containment dikes for 2 cells

Filling with GIWW dredged material to create total of 52 acres of marsh

Site contouring/circulation channel construction/planting

Monitoring plan

Completed within 3 yrs of initiation

BUS J

Restoration Council funds:

New stone breakwater for erosion protection

Construction of new and repair of existing earthen containment dikes for 3 cells

USACE O&M Program funds:

Filling with GIWW dredged material to create total of 149 acres of marsh

Site contouring/circulation channel construction/planting

Monitoring plan

Completed within 13 yrs of initiation

BUILDING STRONG®

Dredged Material Placement Schedule

Dredging Material Placement Schedule for ANWR Beneficial Use Sites A, D, and J
Estimated Maintenance Dredged Material Placement (cubic yards/year)*

GIWW Stationing	Yr1	Yr2	Yr3	Yr4	Yr5	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Total cy/ BUS
BUS A																					
724+000 to 730+000		126,000			126,000			126,000			126,000			126,000			126,000			90,000	
730+000 to 735+000		119,000			119,000			119,000			119,000			119,000			119,000				
Subtotal																					**1,560,000**
BUS D																					
765+000 to 785+000	200,000																				
785+000 to 792+000	150,000																				
Subtotal																					**350,000**
BUS J																					
825+000 to 832+100			80,000			80,000			10,000												
832+100 to 835+000			74,000			74,000			74,000			74,000									
835+000 to 840+000			151,000			151,000			151,000			151,000									
Subtotal																					**1,070,000**
Placement/yr (cy)	**350,000**	**245,000**	**305,000**	**0**	**245,000**	**305,000**	**0**	**245,000**	**235,000**	**0**	**245,000**	**225,000**	**0**	**245,000**	**0**	**0**	**245,000**	**0**	**0**	**90,000**	**2,980,000**

*All dredging and placement assumed to begin 15 April and be completed by 01 October of the indicated year in accordance with whooping crane window.

Project Cost Estimate
(October 2014 Price Level)

	Restoration Council Project Cost			USACE O&M Cost
BU Site A	Construction Cost	$	1,412,700	
	Eng & Design	$	169,600	
	Const Mngt	$	113,100	
	Total:	$	1,695,400	$ 20,237,100
BU Site D	Construction Cost	$	9,120,300	
	Eng & Design	$	1,094,400	
	Const Mngt	$	729,600	
	Total:	$	10,944,300	0
BU Site J	Construction Cost	$	3,852,800	
	Eng & Design	$	462,400	
	Const Mngt	$	308,300	
	Total:	$	4,623,500	$ 12,234,100

Scales of Construction				
Scale 1 (BUS D only)	Total	$	10,944,300	0
Scale 2 (BUS D and J)	Total	$	15,567,800	$ 12,234,100
Scale 3 (BUS D, J and A)	Total	$	17,263,200	$ 32,471,200

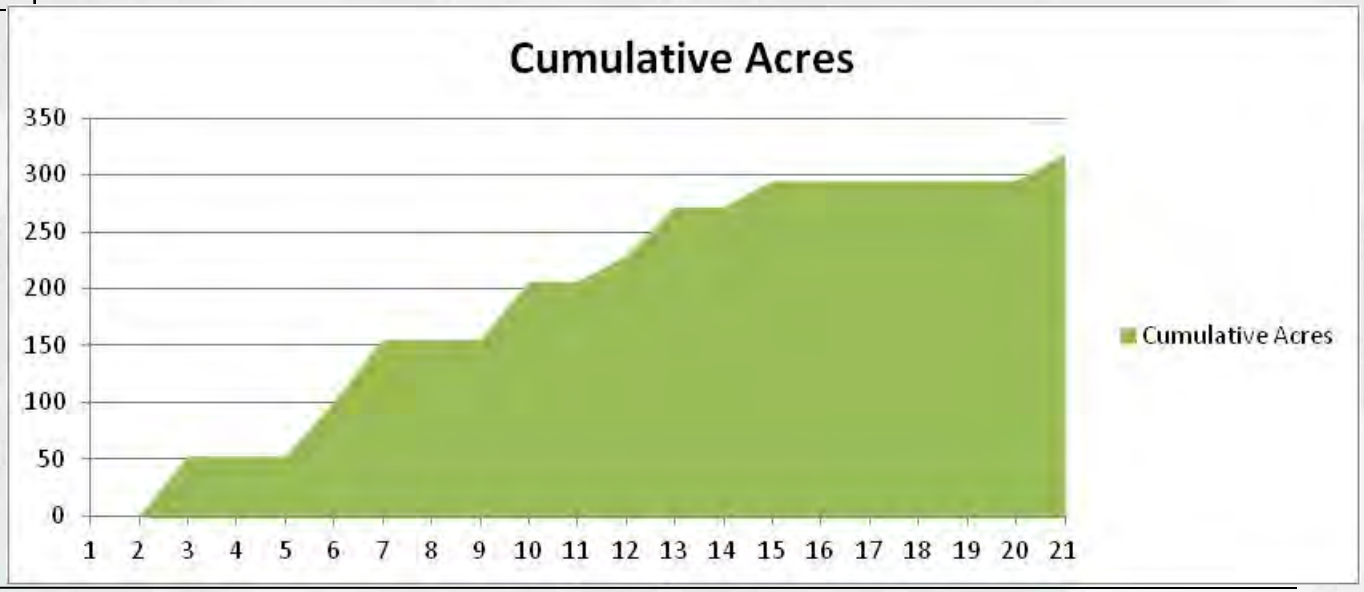
Incremental Marsh Creation

Cell #	Cummulative Acres	Year Completed
D1, D2	52	3
A1, A2	100	6
J1	155	7
J-2	206	10
A3	229	12
J3	272	13
A4	295	15
A5	318	21

Marsh would be created incrementally

For example, Scale 3 would create

- 16 percent by year 3
- 50 percent by year 7
- 94 percent by year 15
- 100 percent by year 21



Project Benefits

- Replacement of lost whooping crane critical habitat
- Enlargement of critical habitat protects whooping cranes and encourages expansion of territories
- Creation of protected shallow water areas suitable for submerged aquatic vegetation
- Addition of hard substrate (rock breakwaters) suitable for oyster colonization
- Created marsh provides additional nursery grounds for finfish and shellfish
- Improvements in water quality result from increase in marsh acreage
- BUDM restores sediment to coastal zone, enhancing natural processes and bay shorelines

Project Benefits (Continued)

- Replacement of lost whooping crane habitat benefits local tourist economy
- Replacement of lost habitat improves resilience of ANWR
- Replacement of lost habitat allows continued operation of GIWW through critical habitat and ANWR
- Monitoring will provide additional scientific data to improve science-based decision making

Endangered Species Act Compliance

Biological Assessment completed May 1989

Formal Section 7 consultation requested and completed

Final Biological Opinion(BiOp) received October 1995

BiOp includes GIWW BUDM plan replacement of 1,614 acres of lost critical habitat as Conservation Recommendation

Oct 2014- USFWS indicates support for reinvigoration of BUDM plan efforts

Will reinitiate informal consultation as required by BiOp because of delays and minor changes in BUDM plan

Other Environmental Compliance Completed

- Final Environmental Impact Statement – Nov 1995
- Record of Decision – 1998
- USFWS Coordination Act Report – Oct 1995
- USFWS Compatibility Determination – July 1995
- Clean Water Act Section 404(r) – 1996
- Migratory Bird Treaty Act – 1996
- National Historic Preservation Act Compliance - 1996

NEPA/Tribal Coordination Updating

Environmental/Tribal Coordination updates required for:

- Coastal Consistency Determination
- Essential Fish Habitat Consultation
- Nation to Nation Tribal Consultation

Real Estate Requirements

- 1995 Feasibility Report did not address RE requirements for BUDM program
- 2014 Attorney's Opinion - appropriate application of navigational servitude
  - Maintenance dredging through this reach of GIWW has a clear navigational purpose
  - Purpose includes BUDM component
  - No real estate required as all work will be conducted in waters of U.S.

Leveraging of Resources/Partnerships

- Completion of BUS A and J would leverage USACE O&M funding to complete the filling of cells constructed and protected with Restoration Council funding
- Location within ANWR and critical habitat requires close coordination and partnership with USFWS
  - Verbal coordination indicates USFWS support
  - Informal consultation as required by Final BiOp to be initiated
- TxDOT is non-Federal sponsor – has provided letter of support
- TxGLO has provided letter of support
- TCEQ (Restoration Council State representative) – seeking letter of support

RECORD OF DECISION
GULF INTRACOASTAL WATERWAY
ARANSAS NATIONAL WILDLIFE REFUGE, TEXAS

This Record of Decision presents the basis for my decision to recommend bank erosion protection and accidental cargo spill containment for the Gulf Intracoastal Waterway (GIWW) where it passes through designated Critical Habitat for the endangered whooping crane. The plan is justified to avoid placing an endangered species in jeopardy in accordance with the Endangered Species Act and fulfills the Corps of Engineers responsibility under Section 7 of the Act. The project will protect the crane's winter feeding and roosting habitat by preventing wind- and navigation traffic-induced wave erosion of the sensitive marshes and ponds along the GIWW and will implement a spill protection and containment plan.

The Feasibility Report and Environmental Impact Statement (EIS) analyzed and described a No-Action alternative, several structural alternatives, and alternate route alternatives for the GIWW. The Corps worked closely with pertinent state and Federal resource agencies to identify the least damaging plan that would protect the whooping crane and its Critical Habitat. As a result of the coordination, the recommended plan is both the environmentally preferable alternative and the National Economic Development plan. The recommended plan for the present alignment of the GIWW between mile markers 485 and 516 consists of bank erosion protection using cellular concrete mats and grout tubes across small bays and lakes to reduce wave impacts and has provisions for a spill containment system. The estimated fully-funded total project cost is $19,510,000 (1 October 1996). The plan does not require mitigation for unavoidable impacts to fish and wildlife resources.

The EIS also describes a 50-year disposal plan for maintenance material dredged from the GIWW. Although not part of the plan recommended for Congressional authorization, the long-term disposal plan is an integral part of the overall plan for preserving the Critical Habitat. The disposal plan will use some existing leveed disposal sites, one new upland disposal site, and beneficially use much of the dredged material to recreate about 1,600 acres of the approximately 2,000 acres of marsh that have been lost since the GIWW was constructed. The final design, planting, and monitoring of the beneficial use sites will be coordinated with state and Federal resource agencies as part of an Interagency Coordination Team to ensure the site's viability and usefulness to the whooping cranes and other components of the ecosystem.

Technical and economic criteria specified in the Water Resource Council's Principles and Guidelines were used to formulate alternative plans. All applicable laws, executive orders, regulations, and resource agency concerns were considered in evaluating the alternatives. All practicable means to avoid or minimize environmental damage from the selected alternative while achieving the goal of protecting endangered species and maintaining navigation have been adopted.

I have reviewed and evaluated all documents concerning the Galveston District Engineer's recommendation, including the views of other interested agencies and the general public, and have considered prevailing administrative policies and environmental policies, and the provisions of Public Law 93-205, as amended. Based upon these factors, I find that the plan recommended in the Final Feasibility Report and EIS, and authorized by Congress in Public Law 104-303, Section 101(a)(29), is suitable for implementation to protect critical habitat of the whooping crane. I further conclude that the Gulf Intracoastal Waterway, Aransas National Wildlife Refuge project should be implemented as soon as practicable.

Based on the conditions set forth in the Galveston District Engineer's finding and the added conditions set forth herein, I conclude that the public interest is best served by the decisions as set forth herein.

RUSSELL L. FUHRMAN
Major General, USA
Director of Civil Works

3 Feb 98
DATE

Texas Department of Transportation
125 EAST 11TH STREET | AUSTIN, TEXAS 78701-2483 | (512) 463-8588 | WWW.TXDOT.GOV

October 6, 2014

Colonel Pannell
US Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553

RE: RESTORE Act
Aransas NWR BU Project

Dear Colonel Pannell,

The Texas Department of Transportation (TxDOT) applauds your efforts and the work of your staff at the Galveston District in providing safe and navigable waterways in Texas. TxDOT is in full support of and is willing to partner with the USACE in establishing a Beneficial Uses of Dredged Material program for the Gulf Region as a whole, and under this program, conduct a beneficial use project along the GIWW in Aransas and Calhoun Counties.

With the BU sites located in designated whooping crane critical habitat in and near the Aransas National Wildlife Refuge (ANWR), this project will benefit critical habitat for the endangered whooping crane as well as provide benefits for the operation of the GIWW. As the non-federal sponsor of the Texas Gulf Intracoastal Waterway (GIWW), TxDOT supports the beneficial use of dredged material anywhere this can be responsibility conducted and this project is a excellent example of the beneficial use process.

TxDOT is continually working toward enhancing the waterways to be a more efficient and effective means of transportation. We look forward to working with USACE Galveston District to provide common solutions to meet the country's waterway needs. I look forward to continuing to work with you in the future.

Sincerely,

Dan Harmon
Director-Maritime Division
Texas Department of Transportation

TEXAS GENERAL LAND OFFICE
JERRY PATTERSON, COMMISSIONER

October 6, 2014

Joseph J. Hrametz
Chief of Operations Division
Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Re: Letter of Support for the Corps' Proposed Gulf Regional Beneficial Use of Dredged Material (BUDM) Program and the GIWW-Aransas National Wildlife Refuge BUDM Project.

Dear Mr. Hrametz:

Please accept this letter of support from the Texas General Land Office (GLO) for the U.S. Army Corps of Engineers' (Corps) proposal to create a Gulf Regional BUDM Program. Establishment of this program will help to realize the Corps' true intention of Regional Sediment Management and will directly address the Gulf Coast Ecosystem Restoration Council's August 2013 *Initial Comprehensive Plan* - Objective #4: "to restore and enhance natural process and shorelines" that includes improved sediment management.

We are also supportive of the proposed BUDM project at or near the Aransas National Wildlife Refuge that would help to address the declining state of wetlands on the Texas coast and provide valuable habitat for the endangered whooping crane and other species that were adversely affected by the Deepwater Horizon Oil Spill. We would be glad to assist you with this project. Depending on the location and scope of the proposed BUDM project, authorization of the use of state-owned submerged land may need to be coordinated with the GLO.

If you have any questions or concerns, please contact me at (512) 475-3624 or at ray.newby@glo.texas.gov

Sincerely,

Ray Newby, P.G.
Coastal Geologist
Coastal Resources
Texas General Land Office

ELIGIBILITY REVIEW

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

Restoration of Whooping Crane Critical Habitat with Beneficial Use of Dredged Material

PROPOSAL NUMBER

ACOE-3

LOCATION

Within Coastal Zone boundaries for Texas Coastal Management Program

SPONSOR(S)

Department of the Army

TYPE OF FUNDING REQUESTED (Planning, Technical Assistance, Implementation)

Implementation

REVIEWED BY:

Bethany Carl Kraft/ Ben Scaggs

DATE:

11-18-14

1. Does the project aim to restore and/or protect natural resources, ecosystems, fisheries, marine and wildlife habitat, beaches, coastal wetlands and economy of the Gulf Coast Region?

◉ YES ○ NO

Notes:

This proposal seeks to create/restore 318 acres of tidal emergent marsh habitat.

2. Is the proposal a project?

○ YES ◉ NO

If yes, is the proposed activity a discrete project or group of projects where the full scope of the restoration or protection activity has been defined?

○ YES ○ NO

Notes:

3. Is the proposal a program?

(●) YES ( ) NO

If yes, does the proposed activity establish a program where the program manager will solicit, evaluate, select, and carry out discrete projects that best meet the program's restoration objectives and evaluation criteria?

(●) YES ( ) NO

Notes:

4. Is the project within the Gulf Coast Region of the respective Gulf States?

(●) YES ( ) NO

If no, do project benefits accrue in the Gulf Coast Region?

( ) YES ( ) NO

Notes:

Eligibility Determination

ELIGIBLE

Additional Information

Proposal Submission Requirements

1. Is the project submission overall layout complete? ***Check if included and formatted correctly.***

A. Summary sheet	☑	F. Environmental compliance checklist	☑
B. Executive summary	☑	G. Data/Information sharing plan	☑
C. Proposal narrative	☑	H. Reference list	☑
D. Location information	☑	I. Other	☑
E. High level budget narrative	☑		

If any items are NOT included - please list and provide details

2. Are all proposal components presented within the specified page limits (if applicable)?

◉ YES ○ NO

Notes: