

Coastal Texas Protection and
Restoration Feasibility Study
Final Feasibility Report

Appendix F:
Real Estate Plan

August 2021

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This Real Estate Plan has been prepared in accordance with Engineer Regulation (ER) 405-1-12 dated May 1, 1998.

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Table of Contents

	Page
List of Figures.....	vi
List of Tables.....	vi
Acronyms and Abbreviations	viii
1.0 GENERAL BACKGROUND	1-1
2.0 PROJECT TYPE AND APPLICABILITY	2-1
2.1 PROJECT AUTHORIZATION	2-1
2.1.1 Recommended Plan.....	2-2
3.0 PURPOSE AND SCOPE	3-1
3.1 PREVIOUS STUDIES	3-1
4.0 GROUP DESCRIPTIONS	4-1
4.1 GALVESTON BAY STORM SURGE BARRIER SYSTEM	4-1
4.2 SOUTH PADRE ISLAND MEASURES	4-3
4.3 ECOSYSTEM RESTORATION MEASURES.....	4-4
5.0 EXISTING FEDERAL & NON-FEDERAL OWNED INTEREST.....	5-1
5.1 EXISTING FEDERAL INTREST.....	5-1
5.1.1 CSRM.....	5-1
5.1.2 ER.....	5-1
5.1.2.1 State Owned Submerged Lands Vs. Navigational Servitude Analysis.....	5-2
5.2 EXISTING NON-FEDERAL INTEREST	5-2
6.0 REAL ESTATE REQUIREMENTS FOR THE COASTAL STORM RISK MANAGEMENT RECOMMENDED PLAN.....	6-1
6.1 OPEN BEACHES ACT (OBA).....	6-1
6.2 CSRM BORROW MATERIAL	6-2
6.3 CSRM ACCESS/STAGING AREAS.....	6-2
6.4 CSRM MITIGATION	6-2
6.5 COASTAL BARRIER RESOURCES ACT (CBRA)	6-3
6.6 REAL ESTATE REQUIREMENTS FOR THE ENVIRONMENTAL RESTORATION (ER) RECOMMENED PLAN.....	6-3
6.6.1 Federal Lands Impacted (Real Estate Requirements).....	6-4
6.6.2 State Lands Impacted (Real Estate Requirements).....	6-4
6.6.3 Non-Standard Estates/Permits and Navigational Servitude Considerations for ER Measures	6-4
6.6.4 Non-Federal Sponsor and Partner Construction Responsibilities for B12 and M8.....	6-5
6.6.5 ER Borrow material	6-5
6.6.6 ER Access/Staging Areas	6-6

Table of Contents

6.7	REQUIRED ESTATE FOR SPONSOR PROVIDED REAL ESTATE	6-6
6.8	RECREATION FEATURES	6-8
7.0	NON-FEDERAL SPONSOR	7-1
8.0	NAVIGATION SERVITUDE	8-1
9.0	INDUCED FLOODING	9-1
10.0	BASELINE COST ESTIMATE FOR REAL ESTATE	10-1
10.1	CSRM COST	10-1
10.2	ER COST	10-10
10.3	MITIGATION COST	10-19
10.4	TOTAL COST	10-20
11.0	PUBLIC LAW 91-646 RELOCATION ASSISTANCE	11-1
11.1	LANDOWNER ASSISTANCE FOR NONSTRUCTURAL MEASURE- CHANNELVIEW	11-1
11.2	LANDOWNER ASSISTANCE FOR NON-STRUCTURAL IMPROVEMENTS- WEST SHORE OF GALVESTON BAY STRUCTURAL MEASURES	11-2
12.0	MINERAL AND ENERGY ACTIVITY	12-1
13.0	ASSESSMENT OF NON-FEDERAL SPONSOR LAND ACQUISITION CAPABILITIES	13-1
14.0	ZONING IN LIEU OF ACQUISITION	14-1
15.0	LITIES/UTILITIES/PIPELINE RELOCATION AND REMOVALS	15-1
16.0	HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE OR OTHER ENVIRONMENTAL CONTAMINANTS	16-1
17.0	SPONSOR NOTIFICATIONS OF RISKS	17-1
18.0	TIMBER RIGHTS	18-2
19.0	LANDOWNER/PUBLIC ATTITUDES	19-1
20.0	EXHIBIT A, FIGURES (ADDITIONAL REAL ESTATE MAP BOOKS AND CAN BE FOUND IN APPENDIX “F” ANNEX 1 & 2)	20-1

Figures

	Page
Figure 1: West Galveston Beach and Dune System	20-1
Figure 2: Bolivar Beach and Dune System.....	20-2
Figure 3: Channelview Breakwaters.....	20-3
Figure 4: Galveston Ring Barrier System.....	20-4
Figure 5: Bolivar Roads Gate System.....	20-5
Figure 6: Clear Lake Gate System.....	20-6
Figure 7: Dickinson Bay Gate System.....	20-7
Figure 8: West Galveston Bay Nonstructural	20-8
Figure 9: South Padre Island Beach Nourishment and Sediment Management	20-9
Figure 10: ER G-28 Bolivar GIWW Shoreline and Island Protection.....	20-10
Figure 11: ER G-28 Galveston GIWW Shoreline and Island Protection.....	20-11
Figure 12: ER B-2 Follets Island Gulf Beach and Dune Restoration	20-12
Figure 13: ER B-12 Bastrop Bay, Oyster Lake, West Bay, and GIWW Shoreline Protection.....	20-12
Figure 14: ER CA-5 Keller Bay Restoration	20-13
Figure 15: ER CA-6 Powderhorn Shoreline Protection and Wetland Restoration	20-14
Figure 16: ER - M-8 East Matagorda Bay Shoreline Protection	20-15
Figure 17: ER - SP1 Redfish Bay Protection and Channel Enhancement	20-15
Figure 18: ER - W-3 Port Mansfield Channel, Island Rookery, and Hydrologic Restoration of Laguna Madre	20-16
Figure 19: Mitigation and Sediment Source Sites	20-17

Tables

Table 4-1: Recommended ER Measures	4-5
Table 6-1: Estimated Land Impacts for Coastal Storm Risk Management Measures.....	6-1
Table 6-2: Estimated Land Impacts for Ecosystem Restoration Measures.....	6-5
Table 10-1: West Galveston Island Beach and Dune BCE.....	10-3
Table 10-2: Bolivar Peninsula Beach and Dune System BCE.....	10-4
Table 10-3: Bolivar Road Gate System	10-5
Table 10-4: Galveston Ring Barrier System BCE	10-6
Table 10-5: Clear Lake Gate System and Pump Station BCE.....	10-7
Table 10-6: Dickinson Gate System and Pump Station BCE	10-8
Table 10-7: South Padre Island Beach Nourishment and Sediment Management BCE.....	10-9
Table 10-8: G28 – Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection BCE.....	10-11
Table 10-9: B2 – Follets Island Gulf Beach and Dune Restoration BCE.....	10-12
Table 10-10: B12 – Bastrop Bay, Oyster Lake, West Bay, and Brazoria GIWW Shoreline Protection BCE.....	10-13
Table 10-11: M8 East Matagorda Bay Shoreline Protection BCE	10-14

Table of Contents

Table 10-12: CA5 – Keller Bay Restoration BCE10-15

Table 10-13: CA6 – Powderhorn Shoreline Protection and Wetland Restoration BCE10-16

Table 10-14: SP1 - Redfish Bay Protection and Enhancement BCE.....10-17

Table 10-15: W3 - Port Mansfield Channel, Island Rookery, and Hydrologic Restoration BCE.....10-18

Table 10-16: Mitigation BCE10-19

Table 10-17: CSRMs Total Costs10-20

Table 10-18: SPI Total Costs.....10-20

Table 10-19: ER Total Costs10-21

Table 10-20: West Shore of Galveston Bay Non-Structural Measures Total Costs10-21

Table 16-1: Pipeline Removal/Relocations15-1

Acronyms and Abbreviations

ADM	Agency Decision Milestone
BEG	Bureau of Economic Geology
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources Systems
CSRM	Coastal Storm Risk Management
ER	Ecosystem Restoration
GCCPRD	Gulf Coast Community Protection and Recovery District
GIS	Geographic Information System
GIWW	Gulf Intracoastal Waterway
GLO	Texas General Land Office
Gulf	Gulf of Mexico
HTRW	hazardous, toxic, radioactive waste
LERRD	land, easements, rights-of-way, relocation, and disposal areas
MLS	Multiple Listing Service
NFS	non-Federal Sponsor
NOAA	National Oceanic and Atmospheric Administration
OMRR&R	operation, maintenance, repair, replacement, and rehabilitation
PL	Public Law
PDT	Project Development Team
PPA	Project Partnership Agreement
REP	Real Estate Plan
RSLR	relative sea level rise
SCCR	Subdivisions and Covenants, Conditions and Restrictions
SLR	Sea level rise
TRRC	Texas Railroad Commission
TSP	Tentatively Selected Plan
TXOBA	Texas Open Beaches Act
UASFLA	Uniform Appraisal Standards for Federal Land Acquisitions
USACE	U.S. Army Corps of Engineers
USC	United States Code
USPAP	Uniform Standards of Professional Appraisal Practice
WRDA	Water Resources Development Act

1.0 GENERAL BACKGROUND

This Real Estate Plan (REP) is the real estate work product of the U.S. Army Corps of Engineers (USACE), Galveston District, Real Estate Division. The Real Estate Division supports project plan formulation for the Coastal Texas Protection and Restoration Feasibility Study. This plan identifies and describes the lands, easements, and rights-of-way required for the construction, operation and maintenance of the proposed project including those required for relocations pursuant to Public Law No. 91-646 relocations and utility/facility relocations, borrow material, dredged or excavated material disposal, and all required lands, easements, rights-of-way, relocations, and disposal areas – collectively referred to by the acronym “LERRD”. The REP describes the required LERRD property, and the estimated LERRD value and administrative and incidental costs attributable to providing LERRD. The information contained herein is tentative in nature and intended for planning purposes only.

This project contains two major components that have been designed to give the most protection to the Texas coast. Coastal Storm Risk Management (CSRМ) and Ecosystem Restoration (ER) features that, when completed, will work together giving the most populated areas two levels of protection. The two levels of protections is designed to protect, restore and maintain a diverse coastal ecosystem and reduce the risks of storm damage to homes and businesses across Texas’s coastal regions. Both components will have challenges throughout the different stages of the project, such as different types of real estate requirements and multiple levels of coordination with local, state and federal agencies. CSRМ components will impact highly developed and populated areas in the Houston-Galveston areas impacting thousands of tracts and ownerships. ER components will be mainly located along the coast impacting mostly state and federal lands.

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2.0 PROJECT TYPE AND APPLICABILITY

The Galveston District of the USACE is conducting a feasibility study to investigate Coastal Storm Risk Management (CSR) and Ecosystem Restoration (ER) opportunities on the Texas Gulf coast. The study area encompasses 18 counties along 400 miles of the Gulf Coast. The footprint area consists of the entire Texas Gulf Coast from the mouth of the Sabine River to the mouth of the Rio Grande and includes the Gulf of Mexico (Gulf) and tidal waters, barrier islands, estuaries, coastal wetlands, rivers, streams and adjacent areas that make up the interrelated ecosystem along the coast of Texas. The area is highly populated with over 6 million people and contains vital infrastructure that supports maritime trade, national security, and other Federal investment. Texas Gulf Coast ports handle more than 563 million tons of foreign and domestic cargo in 2015, approximately 22 percent of all U.S. port tonnage. Texas ports generate \$368.7 billion in economic activity in the state and \$6.9 billion in state and local taxes per year, according to the Texas Ports Association. The Port of Galveston ranked as the fourth largest U.S. cruise market based on embarkation, with more than 834,000 passengers in 2015. Refineries in the study area account for more than 25 percent of the nation's total refining capacity. In addition to the port activity there are 3.9 million acres of wetlands, and 235,000 acres of seagrass making Coastal Texas one of the richest shorelines in terms of aquatic resources of national significance.

2.1 PROJECT AUTHORIZATION

Authorization for the study is under Section 4091, Water Resources Development Act (WRDA) of 2007 P.L. 110-114 which states:

Sec. 4091. Coastal Texas Ecosystem Protection and Restoration, Texas.

(a) In General.—The Secretary shall develop a comprehensive plan to determine the feasibility of carrying out projects for flood damage reduction, hurricane and storm damage reduction, and ecosystem restoration in the coastal areas of the State of Texas.

(b) Scope.—The comprehensive plan shall provide for the protection, conservation, and restoration of wetlands, barrier islands, shorelines, and related lands and features that protect critical resources, habitat, and infrastructure from the impacts of coastal storms, hurricanes, erosion, and subsidence.

(c) Definition.—For purposes of this section, the term “coastal areas in the State of Texas” means the coastal areas of the State of Texas from the Sabine River on the east to the Rio Grande River on the west and includes tidal waters, barrier islands, marshes, coastal wetlands, rivers and streams, and adjacent area.

2.1.1 Recommended Plan

The planning process for this study was driven by the overall objective of developing a comprehensive plan that will help manage risks associated with coastal storms within the study counties while avoiding and minimizing impacts to the region's environmental resources.

CSRM and ER measures were developed and evaluated through several iterations of screening and assembled into alternatives to address specific needs for the Texas coast. This REP will only describe the Recommended Plan and cost. The recommended plan consists of three groups (these could not be evaluated as separable elements, because the Bolivar Roads Gate System is dependent upon stabilized barrier islands); one addresses storm surge in the upper Texas coast, the second addresses erosion in the lower Texas coast, and the third is an ecosystem restoration plan for areas along the coast.

The first group is located in the upper Texas coast and is a combination of beach and dune CSRM features along the seaward portion of west Galveston Island and Bolivar Peninsula, resiliency features to the existing seawall, a storm surge gate system crossing Bolivar Roads and a ring levee protecting the city of Galveston. Additional features include offshore breakwaters north of Harborside Drive and induced damage mitigation measures consisting of and potential residential buy outs within the Channelview neighborhood. Nonstructural measures are also proposed for areas along west side of Galveston bay shoreline north of the Texas City levees due to wind driven storm surges.

The second group for the lower Texas coast consists of beach nourishment and sediment management located in South Padre Island.

The third group is the ER features and includes gulf shoreline restoration (beach and dune restoration, nearshore breakwaters), Gulf Intracoastal Waterway (GIWW) erosion protection, marsh restoration, and oyster reef restoration/creation.

A brief description of all three groups are described below in the following order:

Group one: Section 4.1.1.1 Galveston Bay Surge Barrier System

Group two: Section 4.1.1.2 South Padre Island Beach Nourishment and Sediment Management

Group three: Section 4.1.1.3 Ecosystem Restoration Measures

3.0 PURPOSE AND SCOPE

The purpose of this feasibility study is to identify critical infrastructure and recommend a comprehensive strategy for reducing coastal storm flood risk through structural and nonstructural measures in the event of coastal storms such as hurricanes.

Some of the highest rates of Gulf shoreline erosion in Texas occurs in Jefferson County and to the west end of the Galveston Seawall. Much of the Galveston Island dune system that was washed out by Hurricane Ike has still not recovered, leaving the Houston-Galveston area vulnerable to the next major storm. Restoration of beaches and dunes provides renourishment of sediment to beach and dune complexes to address erosion, shoreline loss, and limited sediment supply.

3.1 PREVIOUS STUDIES

Sabine Pass to Galveston Bay Feasibility Study, 2016. The study encompasses six coastal counties on the upper Texas Gulf coast: Orange, Jefferson, Chambers, Harris, Galveston, and Brazoria. Storm Surge Suppression Study, by the Gulf Coast Community Protection and Recovery District (GCCPRD), 2014 to 2016. A technical, scientific based effort to investigate opportunities to alleviate the vulnerability of the upper Texas coast to storm surge and flooding.

Texas Coastal Resiliency Master Plan, by Texas General Land Office (GLO), 2017 and 2019 (2023 version in progress). A long-term and ongoing study to continue to provide a framework of community, socioeconomic, ecologic, and infrastructure protection from coastal hazards that include short-term direct impacts (e.g., flooding, storm surge) and long-term gradual impacts (e.g., erosion, habitat loss).

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4.0 GROUP DESCRIPTIONS

4.1 GALVESTON BAY STORM SURGE BARRIER SYSTEM

West Galveston and Bolivar Peninsula Beach and Dune System (Figure 1, Figure 2)

Beach and dune construction on West Galveston Island and Bolivar Peninsula form a first line of defense against Gulf of Mexico surge create critical components of the coastal surge barrier and the overall comprehensive risk reduction plan for the upper Texas coast. On West Galveston Island, this CSRM feature would tie into the existing seawall. On Bolivar Peninsula, this CSRM feature would tie into the Bolivar Roads Gate System, supporting the continued integrity and function of the surge gate over time.

Galveston Ring Barrier System (Figure 3, Figure 4)

The Galveston Ring Barrier feature consists of a combination of flood wall (top of wall elevation of +14ft NAVD 88) and gates City of Galveston. The barrier ties into the existing Seawall and proceeds clockwise from the west end of the Seawall north in the proximity of 103rd Street to Offatts Bayou, crosses the Teichman Point area and ties into I-45, continues east along the Harborside area to the 47st street area, then continues north to the Galveston Ship Channel, then continues east through the Port of Galveston to the University of Texas Medical Branch (UTMB), turns northward to the Ferry and then back south to the Seawall. Offshore breakwaters are recommended to reduce wave heights during storm events to mitigate part of the risk. Nonstructural measures for residential structures in the Channelview neighborhood are also recommended to address risk due to the proximity of the neighborhood outside of the floodwalls causing potential wave action deflecting off the flood walls. Although a cost estimate was developed for voluntary home elevations, the uncertainty associated with successful implementation of raising houses caused this option to be set aside for nonstructural buyouts. The higher cost of buying out homes is carried forward in the recommendation. In PED, the existing surge risk, and induced surge risk from the floodwall, will be further investigated to determine if the nonstructural mitigation measures need to be implemented.

Bolivar Roads Gate System, Tie-in Structure and Operations Center (Figure 5)

The crossing starts on Bolivar Peninsula at the end of Biscayne Beach Road with 3.03 miles of earthen levee and proceeds northwesterly to State Highway 87 where the levee turns south westerly to near the intersection of Keystone and 23rd Streets. The barrier continues southwest with combi-wall for 5,000 feet reaching the start of the gate system across Bolivar roads. The 2.08 gate system starts at the end of the combi-wall with 16 Shallow Water Environmental Gates. The next feature is the largest feature of the entire gate system, the deep-draft navigation gates crossing Bolivar Roads. The deep-draft navigation gate openings are designed to be 650 ft wide.

The deep-draft navigation sector gates across Bolivar Roads are anchored and housed in man-made “islands” on either side of the channel. Before construction of any structures, and to minimize impacts to existing channel traffic, the navigation channel will be widened to accommodate the new inbound channel and the inbound sector gate. The widening of the channel will be north of the existing channel toe, through existing anchorage areas, and will be maintained at an 800ft toe to toe width and a depth of –48 MLLW, which is consistent with the existing channel authorized depths. Due to the extension of the existing navigation channel toe to the east to accommodate an inbound lane through the deep-draft navigation sector gate, existing aids to navigation will be relocated and additional aids provided for the extension of the channel. New aids will also be required for the smaller sector gate structures. Existing and/or new aids to navigation would be of can or conical type. Further coordination with the Coast Guard and the shipping industry will be conducted during PED. The gate system then ties into the end of the existing seawall at the San Jacinto Placement Area on Galveston Island.

The Bolivar Roads Gate System will also include a central control control/visitor center (called the Galveston Island Control/Visitor Center) on the Galveston side of the barrier. The Operations Center would be located on the protected side of the barrier near the northeast corner of the San Jacinto Placement Area. The 5,000 square foot building would be on Government owned lands and would be accessible via the construction of a 0.32-mile access road from the existing USMC Reserve Center access road to the building location. The road would be aligned outside the San Jacinto Placement Area perimeter levee.

The Galveston seawall improvement feature is a future adaptation to provide additional storm surge and wave overtopping reduction along Galveston Island, which will connect to the storm surge gate at Bolivar Roads and the beach dune system. The recommendation is to increase the height of 10 miles of the existing seawall to reach a uniform level of protection of 21.0 ft (NAVD88). The extension would go from the San Jacinto levee seawall tie-in to the west end tie in of the GRBS.

Clear Lake Gate System and Pump Station (Figure 6)

This CSR feature consists of a gated closure structure, associated barrier walls, and a pump station to address the residual risk that persists in the Clear Lake area. A closure is proposed at State Highway 146 and Clear Lake to address Bay surge. The design includes a 75 ft sector gate across the channel and a pump station.

Dickinson Bay Gate System and Pump Station (Figure 7)

This CSR feature consists of a gated closure structure, associated barrier walls, and a pump station. A closure is proposed at State Highway 146 and Dickinson Bayou to address Bay surge.

The design includes a 100' foot sector gate across the channel and a pump station. The floodwall and closure structure would start on the west side of State Highway 146, near Avenue T, and end on the south side of the bayou, near Waterman's Harbor west of State Highway 146.

Nonstructural Improvements (Figure 8)

Nonstructural measures are proposed for the west side of Galveston Bay, north of the Texas City hurricane protection levees, to address the residual risk that persists for the area as a result of wind driven storm surges from the Bay. The study team reviewed residential and nonresidential structures within the Galveston Bay system that are predicted to sustain more than \$5,000 in damage in the 20yr, 50yr 100yr or 200yr flood event, under the future with project condition with the surge barrier in place. Based on an evaluation of cost and benefits and the ability to continue to buy down risk, structures still receiving damages in the 100yr event were recommended for voluntary nonstructural raisings. 1,755 residential pier and slab-on-grade structures are being recommended to be raised to the future with project 100yr stage plus 1 ft. and 170 nonresidential slab structures are recommended to be flood proofed to 3ft above the existing ground elevation.

4.2 SOUTH PADRE ISLAND MEASURES

South Padre Island Beach Nourishment and Sediment Management (Figure 9)

This CSR measure includes beach and dune nourishment to maintain a 120 ft width beach and +12.5 ft (NAVD88) dune along 2.9 miles of the developed shorefront areas of SPI, from Sea Vista Condos near McCarter Road and Padre Road to the beginning of Andy Bowie Park. This feature is a dune and berm feature that will be constructed on South Padre Island. While developing the footprint for these measures, state and county policies such as the Open Beaches Act (OBA), State Submerged Lands Act and Cameron County's Historical Building Line (HBL) were considered.

Under the Open Beaches Act (OBA), the public has the free and unrestricted right of access to the public beach bordering the seaward shore of the Gulf of Mexico.[1] The "public beach" includes the state-owned beach, commonly referred to as the "wet beach," extending seaward from the line of mean high tide (or mean higher high tide in areas where the land was patented prior to 1840) and may also include the "dry beach." The dry beach extends landward from the line of mean high tide to the LOV. The "public beach" includes both the state-owned wet beach and areas of the dry beach where the public has acquired a "right of use or easement to or over the area by prescription, dedication, presumption, or has retained a right by virtue of continuous right in the public since time immemorial, as recognized in law and custom." [2] In many cases, the public beach includes areas of the dry beach located on privately owned land.

The landward boundary of the public beach is generally marked as the LOV, the location of which is determined by the GLO using the methodology set forth in the OBA under TNRC Sections 61.016 and 61.017.

The State Submerged Lands Act of 1953 applies within navigable waters, and lands beneath, within the boundaries of the respective coastal states out to 3 nautical miles from its coast line (3 marine leagues for Texas and the Gulf coast of Florida; to the international boundaries of the U.S. in the Great Lakes or other waters traversed by such boundaries). The term “coastline” is “the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters.” (43 U.S.C. § 1301(c)). Submerged Lands Act boundaries between coastal states and the U.S. are not fixed unless done so by a deliberate action of the U.S. Supreme Court (i.e., by a decree “fixing” the boundary by coordinates). The Submerged Lands Act Boundary (also known as the State Seaward Boundary or Fed-State Boundary) defines the seaward limit of a state’s submerged lands and the landward boundary of federally managed outer Continental Shelf lands.

The Historical Building Line (HBL) is a line that was established by Texas Attorney General for properties with ocean frontage along the Gulf of Mexico prior to development of Beach Dune Plans. There are no habitable structures allowed to be built seaward of the HBL.

4.3 ECOSYSTEM RESTORATION MEASURES

Coastwide All-Inclusive Restoration

The recommended ER plan would restore natural features, which provide habitat within the coastal ecosystem and support natural conditions to withstand coastal storm conditions that cause land and habitat loss. Table 4-1 lists the measures for the coast wide all-inclusive restoration plan, which are future described below.

Table 4-1: Recommended ER Measures

Coastwide All-Inclusive Restoration Plan	
ER Measure	Name
G-28	Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection
B-2	Follets Island Gulf Beach and Dune Restoration
B-12	Bastrop Bay, Oyster Lake, West Bay, and GIWW Shoreline Protection
M8	East Matagorda Bay Shoreline Protection
CA-5	Keller Bay Restoration
CA-6	Powderhorn Shoreline Protection and Wetland Restoration
SP-1	Redfish Bay Protection and Enhancement
W-3	Port Mansfield Channel and Island Rookery Restoration

G-28: Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection (Figure 10, Figure 11)

This measure consists of shoreline protection and restoration utilizing 36 miles of rock breakwater at a crest height of 7 feet with 2H:1V side slopes and a base width of 46 feet, 18 acres of oyster cultch creation, 664 acres of marsh restoration, and 5 miles of island restoration. The island restoration feature will be protected by an additional 5.1 miles of breakwaters. B-2: Follets Island Gulf Beach and Dune Restoration (Figure 12)

This measure consists of shoreline protection and restoration utilizing 43 miles of rock breakwater at a crest height of 7 feet with 2H:1V side slopes and a base width of 46 feet, 0.17 acre of oyster cultch creation, 551 acres of marsh nourishment. B-12: West Bay and Brazoria GIWW Shoreline Protection (Figure 13)

This feature is located along the GIWW from West Galveston Bay to approximately 15 miles west of the city of Freeport. The feature will include 551 acres of estuarine marsh restoration and continuing nourishment and 3,708 linear feet of oyster reef creation. Additionally, 43.2 miles of breakwaters will be constructed along the western side of West Galveston Bay, Cowtrap Lake, and along selected segments of the GIWW in Brazoria County.

M-8: East Matagorda Bay Shoreline Protection (Figure 16)

This feature is in Redfish Bay near Corpus Christi, Texas. The feature includes 391.4 acres of island restoration for Dagger, Ransom, and Stedman Islands and 7.4 miles of breakwater construction along the restored islands and along unprotected segments of the GIWW. Additionally, 7,392 linear feet of oyster reef will be created between the breakwaters and the restored islands

CA-5: Keller Bay Restoration (Figure 14)

This feature is located on a peninsula that extends between Lavaca, Matagorda, and Keller Bays and includes approximately 3.8 miles of breakwater construction along the Matagorda Bay side of the peninsula. Oyster reef will be constructed over 12,213 linear feet along the Lavaca Bay side of the peninsula.

CA-6: Powderhorn Shoreline Protection and Wetland Restoration (Figure 15)

This feature is in west Matagorda Bay from Indianola south to Port O'Connor, Texas. This measure consists of shoreline protection and restoration utilizing 5.0 miles of rock breakwater at a crest height of 7 feet with 2H:1V side slopes and a base width of 46 feet, and 529 acres of wetland and marsh restoration.

SP-1: Redfish Bay Protection and Enhancement (Figure 17)

This measure consists of shoreline protection and restoration utilizing 7.4 miles of rock breakwaters at a crest height of 7 feet with 2H:1V side slopes and a base width of 46 feet.

The measure provides for the restoration of the Dagger, Ransom, and Stedman island complex in Redfish Bay by the construction of 4.75 miles of breakwater along the unprotected GIWW shoreline along the backside of Redfish Bay and 2.75 miles of breakwater on the bayside of the restored islands. Additional protection is provided to island complex by the addition of reef balls between the breakwater and island complex for the creation of 2.0 acres of oyster reef. W-3: Port Mansfield Channel, Island Rookery, and Hydrologic Restoration (Figure 18)

This feature is located along the Port Mansfield Channel on North Padre Island. The feature will include 27.8 acres of bird island restoration with an associated 0.7 miles of breakwater construction around the island. Also, the North Padre Island gulfward beach will be nourished for 9.5 miles north of the northern Port Mansfield Channel Jetty. Source material for the beach nourishment will come from dedicated dredging of the Port Mansfield Channel. The dredging will also restore the hydrologic connection between the channel and Brazos Santiago Pass across approximately 113,000 acres of the Laguna Madre.

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5.0 EXISTING FEDERAL & NON-FEDERAL OWNED INTEREST

This section outlines the existing federal and non-federal interests relevant to the project. When there is an available government property right, it will be utilized to support the construction and ultimate operation of the project.

Any additional acquisition beyond existing government rights; however, is the responsibility of the non-federal sponsor. Federal and non-federal real estate interest within the recommended plan are described below by project feature.

5.1 EXISTING FEDERAL INTREST

5.1.1 CSRM

The Bolivar Roads Gate System will also include a central control/visitor center on the Galveston side of the barrier. The Operations Center would be located on the protected side of the barrier, outside of the northeast corner of the San Jacinto Placement Area on 15 acres of lands identified as Tract "C". Subject land is located extreme east end of Galveston Island, ceded to the U.S. by the Treaty of Annexation of 1845 when the Republic of Texas was admitted to the Union. Jurisdiction over this tract has been claimed by the Government since the annexation of Texas to the U.S. (formerly Fort San Jacinto Military Reservation).

5.1.2 ER

ER alignment measures overlap USFWS lands in measures B12, G28, and M8. USFWS ultimately responsible for managing its refuge and park lands. The NFS would not acquire the tracts located within the National Wildlife Refuge (NWR), as the USFWS would seek their own funding for the project; USACE is only seeking Congressional authorization and funding for portions of the project occurring on private- and state-owned lands.

Non-standard estates will be required for the construction of the ER features located on private- and state-owned lands. The NFS and State will need to enter an agreement, resulting in a non-standard estate requiring approval by USACE Headquarters as set forth in ER 405-1-12. The request for approval of the non-standard estate will be made by separate request to USACE HQ and can be reasonably anticipated to take approximately twelve months. If it is later determined that the navigation servitude is available for the project ER features, then no NFS acquisition will be required to support construction or O&M of these features within the servitude.

5.1.2.1 State Owned Submerged Lands Vs. Navigational Servitude Analysis

A cost allocation comparison was conducted on ER measures containing state submerged lands (B12, G28, and M8) with and without the application of navigational servitude.

Table 5.1 Allocation with Application of Navigational Servitude Adjacent to GIWW with State Submerged Lands Cost Shared

ER Measure/State %Owned	Cost
B12: 8.4%	\$757,438.50

5.2 EXISTING NON-FEDERAL INTEREST

Portions of CSRMs and ER features will lie within submerged land owned by the State of Texas and administered by the GLO. The NFS will be required to enter into a long term lease, for the construction and future operation and maintenance of portions of the project owned by the State of Texas, with GLO which will result in a conveyance of interest, resulting in a non-standard estate to the NFS.

6.0 REAL ESTATE REQUIREMENTS FOR THE COASTAL STORM RISK MANAGEMENT RECOMMENDED PLAN

The CSRSM recommended plan will require approximately 3,400 acres in perpetual easements and 367.7 acres in temporary work area easements, and 19.3 acres in fee impacting a total of 2,170 tracts and 1,468 owners. Table 6-1 provides the expected easements and type of estates required for each of the measures within in the footprint. The estates identified here are discussed in detail in Section 4.3 of this REP. A tract register listing parcel, land ownership information is available upon request.

Table 6-1: Estimated Land Impacts for Coastal Storm Risk Management Measures

Recommended Plan	Measure	Feature	Estate Required	Est. Owners	Est. Tracts	Fee	Perpetual Easements (acres)	Temp. Work Area Easements (acres)
(Coastal Barrier/Nonstructural System with Galveston Ring Levee)	West Galveston and Bolivar Beach/ Dune	Beach and Dune Barrier	Std. Estate#26	1,004	1,460	0	1,465.2	171.3
	Galveston Ring Barrier	Floodwall/Levee/ Drain Structures/Comb-walls/Pump Stations/Circulation Gate/ Nonstructural Channelview/Seawall	Fee Navigational Servitude/ Non-Std. Estate for O&M (Submerged Lands)	267	395	19.3	141.3	183.6
Clear Lake /Dickinson Bay Gate Systems		Navigation Gate	Navigational Servitude/	26	34	0	136	11.82
Bolivar Roads Gate System		Navigation Gate/Tie-in	Non-Std. Estate for O&M (Submerged Lands)	17	91	0	1,058	155
South Padre Island		Beach and Dune Barrier	Std. Estate#26	154	148	0	68	6

6.1 OPEN BEACHES ACT (OBA)

Under the Open Beaches Act (OBA), the public has the free and unrestricted right of access to the public beach bordering the seaward shore of the Gulf of Mexico.[1] The “public beach”

includes the state-owned beach, commonly referred to as the “wet beach,” extending seaward from the line of mean high tide (or mean higher high tide in areas where the land was patented prior to 1840) and may also include the “dry beach.” The dry beach extends landward from the line of mean high tide to the LOV. The “public beach” includes both the state-owned wet beach and areas of the dry beach where the public has acquired a “right of use or easement to or over the area by prescription, dedication, presumption, or has retained a right by virtue of continuous right in the public since time immemorial, as recognized in law and custom.” In many cases, the public beach includes areas of the dry beach located on privately owned land.

The landward boundary of the public beach is generally marked as the LOV, the location of which is determined by the GLO using the methodology set forth in the OBA under TNRC Sections 61.016 and 61.017.

6.2 CSRM BORROW MATERIAL

Borrow material required for the earthen levee features of CSRM will be acquired commercially, rather than obtained from a borrow area under Federal control. The costs associated with the acquisition of the borrow material will be a construction cost, and the NSF will not be eligible for LERRD crediting for these costs. If this plan is altered during PED, the NFS must acquire necessary easements and environmental clearances for any proposed borrow area under existing federal control.

Material for beach and dune features will be sourced approximately 40 miles offshore with a water depth of 40-50 feet and will be used for both initial construction operations and renourishment activities.

6.3 CSRM ACCESS/STAGING AREAS

545 acres are required for access/staging areas for the CSRM portion of the project. Access to the beach and dune features are assumed to be available through public access locations. Final determination of access and staging areas requirements will be determined in PED phase.

6.4 CSRM MITIGATION

Compensatory mitigation is required for the unavoidable impacts to the environment that are caused by the Recommended Plan, specifically from the implementation of the Galveston Bay Storm Surge Barrier System. Impacted habitat types are estuarine emergent wetland, palustrine emergent wetland, oyster reef, and open bay bottom. The impacts are divided into two categories, direct and indirect:

- Direct Impacts are caused by the footprint of CSRM feature construction

- Indirect Impacts are caused by construction induced changes to the environment that are not within the direct footprint.

A Mitigation Plan, which is included as Appendix C-1 in the attached EIS, details proposed plans to replace the lost functions and values of the impacted areas through restoration or enhancement activities that increase and/or improve the habitat functions and services within a mitigation site.

Potential locations, as shown in Figure 19, for mitigation sites have been developed with the interagency team but will be refined further during the PED phase. Ultimately, the final size of the mitigation measures (width, length etc.) may change. The conservative engineering approach and economic assumptions used in the development of the Recommended Plan, will result in equal or lesser environmental impacts than currently estimated as the plan is refined in PED.

Ecological mitigation will occur across Galveston and West Galveston Bays and includes construction of new oyster reefs, palustrine wetlands, and estuarine wetlands. Oyster reef construction will be located in the vicinity of Alligator Point Rookery, Evia Island, and in Dickinson Bay. Palustrine wetlands will be constructed on Galveston Island in three locations bounded by Pabst Road and Grand Avenue on the east and west and by Stewart Road and FM 3005 on the north and south. Estuarine wetlands will be constructed in seven locations: Dickinson Bayou, Seabrook, and Greens Lake on the mainland, and Sievers Cove and three locations within Horseshoe Lake on the Bolivar Peninsula. The NFS will be responsible for acquiring all lands needed for the habitate mitigation for this project.

6.5 COASTAL BARRIER RESOURCES ACT (CBRA)

The Coastal Barrier Resources Act (CBRA) of 1982 established the John H. Chafee Coastal Barrier Resources Systems (CBRS), a defined set of geographic units along the Atlantic, Gulf of Mexico, Great Lakes, U.S. Virgin Islands, and Puerto Rico coasts. Most new Federal expenditures and financial assistance are prohibited within the CBRS, unless those activities qualify for an exception under Section 6 of CBRA (16 USC § 3505). Additional information on CBRA can be found in the main report of this study.

Features located in CBRA Zones have been identified and a detailed summary of CBRA coordination efforts is included in Appendix E of the Draft EIS and are shown in figures 21-24.

6.6 REAL ESTATE REQUIREMENTS FOR THE ENVIRONMENTAL RESTORATION (ER) RECOMMENED PLAN

The recommended ER plan will require approximately 6,300 acres impacting a total of 5,550 tracts and 2,766 owners. ER measures impact three different types of ownerships; private, state, and federal. The required estate for ecosystem restoration projects per ER 405-1-12 is fee. The fee estate will be required for all ER measures on lands not owned by the state. However, a lesser

estate for ER features on state lands will be permissible depending on project formulation and operation. This lesser estate for state owned lands will be in the form of a non-standard estate. The PDT has worked with TPWD and USFWS to assure the missions of TPWD, USFWS and NPS aligns with the purpose of this ecosystem restoration project, which should justify the non-standard permit and continuation of ownership by the State of Texas. Standard Estate #21 Bank Protection Easement will be required for ER features located along the banks of the GIWW.

6.6.1 Federal Lands Impacted (Real Estate Requirements)

ER features located on submerged lands with a federal interest will require the NFS to acquire a non-standard permit to support all O&M requirements. A permit is the outgrant type permitted and prescribed by NPS regulation. Approval of the permit terms will be pursued in PED or during the implementation phase of the project once terms and requirements between the state and NFS (agency of the state) are determined. A draft non-standard permit is not available as of the date of the REP. As a result of the non-standard permit, the continuing care and maintenance of the project features will need to be addressed in the project partnership agreement (PPA).

6.6.2 State Lands Impacted (Real Estate Requirements)

At the time of this report, GLO has proposed the non-standard estate for ER features on state owned lands will be a long-term lease. Specific wording of the estate is not available for this transaction at this time and it cannot be finalized until we have all the design and construction requirements. Half Moon Reef non-standard estate is an example of a long-term lease granted by the State of Texas to The Nature Conservancy in 2012 for the construction and O&M of a twelve-acre oyster reef located in Matagorda Bay for the term of sixty years. A copy of this instrument can be provided upon request.

6.6.3 Non-Standard Estates/Permits and Navigational Servitude Considerations for ER Measures

Until final ER designs have been approved for construction, a non-federal construction sponsor has been identified, and an assessment of the non-federal sponsor's ability to acquire real estate has been completed, the District may not negotiate non-standard estates/permits or utilize them in official appraisals or planning efforts. If it is later determined that the navigation servitude is available for the project ER features, then no NFS acquisition will be required to support construction or O&M of these features within the servitude. Table 6-2 lists the land impacts for each of the measures within in the footprint.

6.6.4 Non-Federal Sponsor and Partner Construction Responsibilities for B12 and M8

As it relates to cost allocation and implementation, there are portions of ER Measure B12 and ER Measure M8 that fall within U.S. Fish and Wildlife Service (USFWS) property. A Coastal Boundary Survey conducted prior to construction, pursuant to Texas Natural Resources Code Section 33.136, will establish the boundary between State-owned submerged lands and other lands, such as USFWS lands. The USFWS will be responsible for restoration measures that are on or benefitting only the National Wildlife Refuge's lands. The current total estimated cost for these portions of ER Measure B12 and ER Measure M8 is approximately \$403 million. The remaining portions of the ER Measure B12 and ER Measure M8 will be the responsibility of the USACE and the non-Federal ER sponsor. The above identified Federal share of the Coastwide ER Plan includes this \$403 million, which is anticipated to be implemented by the USFWS or another partner. However, it should be noted that the success and benefits associated with the remainder of the Coastwide ER Plan are not dependent on the construction of these portions of ER Measure B12 and ER Measure M8.

Table 6-2: Estimated Land Impacts for Ecosystem Restoration Measures

All Real Estate to be Acquired								
Recommended Plan	Measure	Est. Tracts	Est. Owners	Submerged Land (acres)	Beach (acres)	Dunes (acres)	Wetlands (acres)	Buildable (acres)
Coastwide All-Inclusive Restoration)	G-28	428	111	203.18	0	0	906.14	289
	B-2	227	21	674.29	140.68	262.07	0	0
	B-12	239	28	13.31	0	0	825	958
	M-8	16	6	284.53	0	0	52	5,881
	CA-5	137	124	29.85	0	0	0	0
	CA-6	57	38	143.77	0	0	378	12
	SP-1	0	0	454.80	0	0	0	0
	W-3	1	1	471.79	1,446.34	0	0	0

6.6.5 ER Borrow material

Beach and dune ER measures will receive material sourced from offshore locations. The ER measures such as wet land, marsh and island restoration will receive material sourced from locations along the GIWW, or navigation channels crossing the GIWW subject to the proximity to the ER feature requiring material.

6.6.6 ER Access/Staging Areas

Access to the beach and dune features are assumed to be available through public access locations. It is assumed that staging areas for beach and dune ER features will be located within the Beach Storm Damage Reduction Easement required to construct subject ER features.

Access and staging for ER features located along the GIWW are assumed to be by open water and barge. Final determination of access and staging areas requirements will be determined in PED phase.

6.7 REQUIRED ESTATE FOR SPONSOR PROVIDED REAL ESTATE

The non-Federal Sponsor (NFS) is responsible for acquiring and furnishing all required LERRDs for the project. USACE policy specifies the standard estate required for a cost shared civil works project is based on the proposed use of the land. Engineering Regulation (ER) 405-1-12 Chapter 12-9 specifies the estate for each proposed land use. The actual text of the standard estate is provided in Engineering Circular (EC) 405-1-11 Exhibit 5-29. These estates have been developed over many years in coordination with the Department of Justice during litigation involving government acquisition. Altering or deviating from these estates is prohibited; except when such alteration or deviation is specifically approved by both Division and Headquarters.

In general, lands needed for the CSRSM components of the project will be acquired through a combination of fee, permanent easements, and temporary work area easements. ER features will require fee estate for privately owned lands and a non-standard estate for any state-owned lands needed for the ER features. The real estate requirements for the project must support construction as well as the continued operation and maintenance of the project. Most of the acreage affected by the project consists of residential, commercial, industrial, vacant/undeveloped, and wetland/marsh land.

Construction of the complete project, including the breakwater and/or living shoreline, will require a variety of real estate interests as outlined below and will depend on the specific footprint developed in PED. By policy, USACE requires standard estates for all LERRD which fully allows construction and perpetual operations and maintenance of the project. The specific estate utilized depends on the nature of the project use and must fully support both construction rights, and future operation and maintenance requirements.

Any necessary non-standard estates will be drafted in PED phase in coordination with the vertical team, the District Engineering and Planning team, and the NFS. The Director of Real Estate revised the process to obtain non-standard estate approval by Memorandum dated February 14, 2018. The Memorandum states that seeking approval of non-standard estates cannot be done in a feasibility report. The District must submit a proposed Real Estate Strategy through

coordination and endorsement from the Division, to use a non-standard estate to CEMP-CR for HQ approval. The following USACE standard estates and proposed non-standard estate are being utilized in the planning portion of this project:

Non-Standard Estate

A copy of the Half Moon Reef non-standard estate can be provided upon request.

Standard Estate #1. Fee

The fee simple title to (the land described in Schedule A) (Tracts Nos. _____, _____ and _____) subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Standard Estate #9. Flood Protection Levee Easement

A perpetual and assignable right and easement in the land described to construct, maintain, repair, operate, patrol and replace a flood protection levee, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Standard Estate #15. Temporary Work Area Easement

A temporary easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. _____, _____ and _____), for a period not to exceed _____, beginning with date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as (borrow area) (work area), including the right to (borrow and/or deposit fill, spoil and waste material thereon) (move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the _____ Project, together _____ with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structure, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Standard Estate #21. Bank Protection Easement

A perpetual and assignable easement and right-of-way in, on, over and across the land hereinafter described for the location, construction, operation, maintenance, alteration, repair, rehabilitation and replacement of a bank protection works, and for the placement of stone, riprap and other materials for the protection of the bank against erosion; together with the continuing right to trim, cut, fell, remove and dispose therefrom all trees, underbrush, obstructions, and other vegetation; and to remove and dispose of structures or obstructions within the limits of the right-of-way; and to place thereon dredged, excavated or other fill material, to shape and grade said land to desired slopes and contour, and to prevent erosion by structural and vegetative methods and to do any other work necessary and incident to the project; together with

the right of ingress and egress for such work; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however to existing easements for public roads and highways, public utilities, railroads and pipelines.

Standard Estate #26. Perpetual Beach Storm Damage Reduction Easement

A perpetual and assignable easement and right-of-way in, on, over and across (the land described in Schedule A) (Tract No. _____) for use by the (Project Sponsor), its representatives, agents, contractors, and assigns, to construct; preserve; patrol; operate; maintain; repair; rehabilitate; and replace; a public beach [a dune system] and other erosion control and storm damage reduction measures together with appurtenances thereto, including the right to deposit sand; to accomplish any alterations of contours on said land; to construct berms [and dunes]; to nourish and renourish periodically; to move, store and remove equipment and supplies; to erect and remove temporary structures; and to perform any other work necessary and incident to the construction, periodic renourishment and maintenance of the (Project Name), together with the right of public use and access; [to plant vegetation on said dunes and berms; to erect, maintain and remove silt screens and sand fences; to facilitate preservation of dunes and vegetation through the limitation of access to dune areas;] to trim, cut, fell, and remove from said land all trees, underbrush, debris, obstructions, and any other vegetation, structures and obstacles within the limits of the easement (except _____); [reserving, however, to the grantor(s), (his) (her) (its) (their) (heirs), successors and assigns, the right to construct dune overwalk structures in accordance with any applicable Federal, State or local laws or regulations, provided that such structures shall not violate the integrity of the dune in shape, dimension or function, and that prior approval of the plans and specifications for such structures is obtained from the (designated representative of the Project Sponsor) and provided further that such structures are subordinate to the construction, operation, maintenance, repair, rehabilitation and replacement of the project; and further] reserving to the grantor(s), (his) (her) (its) (their) (heirs), successors and assigns all such rights and privileges as may be used and enjoyed without interfering with or abridging the rights and easements hereby acquired; subject however to existing easements for public roads and highways, public utilities, railroads and pipelines.

6.8 RECREATION FEATURES

The proposed project does not have any recreation features.

7.0 NON-FEDERAL SPONSOR

The USACE Galveston District is responsible for the overall management of the study. The NFS for the study is the GLO and has been actively involved throughout the study process. The GLO will not be responsible for construction, operation, maintenance, repair, replacement, and rehabilitation (OMRR&R). A separate local sponsor will be sought for certain identified portions of the project and will be responsible for construction and OMRR&R of the project. The OMRR&R NFS must have the ability to own the necessary land interests to perform this work, which will require a non-standard Project Partnership Agreement (PPA). Texas legislation will be creating a NFS (state created agency) who will be responsible for the construction and OMRR&R for each project feature. As stated in section 7.2 of the main report

“The State of Texas (encompassing its various entities, including the GLO) has issued a Letter-of-Intent stating its intent to serve as the non-Federal sponsor for ER measures, with support from local entities, for future phases of the Coastal Texas Protection and Restoration Plan. State legislators approved and signed a bill in the Texas Senate and House with Gov. Greg Abbott signing June 16 to create the Gulf Coast Protection District, which will support the State of Texas and the USACE in the implementation of this project.”

The addition of a separate NFS for construction and OMRR&R will require that certain LERRD instruments be assignable to eligible NFS partners or administratively transferred after completion of construction. This may require deviations from the standard estates.

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8.0 NAVIGATION SERVITUDE

The recommended plan, will include CSRM features which will lie within navigational waters of the United States. The application of navigation servitude would apply for the construction of the structures below.

- Bolivar Roads Gate System
 - Deep-draft-navigation 650' sector gate
 - 125' sector gates
 - Vertical lift gates
 - Shallow water environmental gates
 - Bypass channel
 - Combi-wall and levee tie in
 - Anchorage ares
- Galveston Ring Barrier System
 - Offatts Bayou Closure
 - Pump stations
 - Seawall Improvement
- Clear Lake Gate System
- Dickinson Bay Gate System

The District requested administrative approval to utilize navigation servitude for these features. HQ Counsel has determined that the navigation servitude is available for the construction for the navigation gates and surge barrier structures; however, the servitude will not be available for the O&M. As a result, there will have to be a federal requirement for the NFS to acquire an interest in the submerged lands and any associated uplands to support the project. GLO (fee owner of submerged lands) has agreed to provide an interest in land to the NFS (agency of the state) in the form of a long-term lease.

The actual lease proposed is not available at this time of this report; therefore, the subject real estate instrument will require subsequent HQUSACE approval as both a lesser estate and a non-standard estate. Since this real property interest has been determined as necessary by the federal Government, associated costs will constitute creditable LERRD. Additional opportunities to utilize navigational servitude may arise as the plan is refined in PED.

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9.0 INDUCED FLOODING

An investigation of induced flooding was performed by using storm models applying “with” and “with-out” project conditions. Most of the inducements observed in the model results can be deemed unrealistic and can be attributed to either limitations in how the model incorporates the gate or how the probabilistic values were determined; however, there are some that are potential inducements, so this section seeks to parse out those observed inducements that should or should not be included in the Real Estate Mitigation costs. Additional clarification of the interpretation of the Feasibility Model Results can be found in Appendix D Engineering section 2.6.4.1.

Although the results of the storm models were determined to be “unrealistic”, decisions were made between the PDT, MSC and HQ that the PDT mitigate for this risk. The PDT developed induced mitigation cost at feasibility level of detail and included into the report that additional H&H investigation will be required in PED Phase. Induced real estate mitigation cost were developed by conducting a buy-out approach of 450 tracts with the potential impacted structures. That cost would be included to the Bolivar Roads Gate System as real estate mitigation cost for possible induced flooding.

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10.0 BASELINE COST ESTIMATE FOR REAL ESTATE

10.1 CSRM COST

The baseline cost estimate (BCE) provided in this report are based on feasibility level design. In order to account for the additional risk present when determining real estate requirements for the feasibility level design, a contingency has been included in each table. Total project costs are not expected to be greater than \$33B. Pursuant to Policy Guidance Letter (PGL) 31 dated 11 January 2019, “for projects in which the value of real estate (lands, improvements, and severance damages) are not expected to exceed 30% of total project costs (total costs to implement project), a brief gross appraisal will be acceptable for purposes of the feasibility phase.” As such, the land cost listed in the tables below are based on a brief gross appraisal cost estimate.

The following assumptions were made when preparing the cost estimate for the BCE:

- The total costs for relocations are estimated to be \$75,281,000 and are the responsibility of the non-federal sponsor. Relocation costs include construction costs only, as there are no lands required for relocations.
- 25% contingency was used to develop BCE.
- South Padre Island is mostly a tourism revenue driven market with land use polices along the Texas coast very specific to the location. Analysis of project location was conducted Q1 of 2020 at the midst of the Coronavirus Pandemic, leaving an economic uncertainty to the real estate market. These factors determined 35% contingency was appropriate for the South Padre Island land cost. All administration cost associated to the acquisition of real estate for South Padre Island CSRM feature used a 25% contingency.

The following tables are the BCE for all CSRM features as listed below.

- West Galveston Island Beach and Dunes System
- Bolivar Peninsula Beach and Dunes System
- Bolivar Roads Gate System
- Galveston Ring Levee System
- Clear Lake Gate System and Pump Station

- Dickinson Bay Gate System and Pump Station
- South Padre Island Beach Nourishment and Sediment Management

Table 10-1: West Galveston Island Beach and Dune BCE

West Galveston Island Beach and Dune System			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission 40 hrs. x \$125/hr. per tract)	\$2,700,000.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and State Land)	\$6,896,700,00.00
	0105	Appraisals (\$2,500 per tract)	\$1,350,000.00
		Survey (\$4,000 per tract)	\$2,160,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$540,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County and Sponsor Owned Lands <i>(Includes CBRA lands of \$1,370,264.00)</i>)	\$171,500,000.00
		Utility Relocations (Admin Cost)	\$9,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$540,000.00
		Subtotal	\$185,695,700.00
		Contingency	\$46,423,925.00
Non-Federal Total			\$232,119,625.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$675,000.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$790,500.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$405,000.00
	01-0117	Potential Pipeline Relocations Costs (Admin Only Not Construction Costs) (3,000 each) (AOC)	\$9,000.00
		Subtotal	\$1,870,500.00
		Contingency	\$467,625.00
Federal Total			\$2,338,125.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$234,457,750.00

Table 10-2: Bolivar Peninsula Beach and Dune System BCE

Bolivar Peninsula Beach and Dune System			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission 40 hrs. x \$125/hr. per tract)	\$5,605,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$10,300,500.00
	0105	Appraisals (\$2,500 per tract)	\$2,802,500.00
		Survey (\$4,000 per tract)	\$4,484,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$1,121,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County and Sponsor Owned Lands. <i>(Includes CBRA lands of \$11,970,677)</i>)	\$91,200,000.00
		Utility Relocations (Admin Cost)	\$15,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$1,121,000.00
		Subtotal	\$116,649,000.00
		Contingency	\$29,162,250.00
	Non-Federal Total		
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$1,401,250.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$1,471,500.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$844,500.00
	01-0117	Potential Pipeline Relocations Costs (Admin Only Not Construction Costs) (3,000 each) (AOC)	\$15,000.00
		Subtotal	\$3,717,250.00
		Contingency	\$929,312.50
Federal Total			\$4,646,562.50
GRAND TOTAL (Federal and Non-Federal Cost):			\$150,457,812.50

Table 10-3: Bolivar Road Gate System

Bolivar Road Gate System			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission 40 hrs. x \$125/hr. per tract)	\$480,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$1,395,900.00
	0105	Appraisals (\$2,500 per tract)	\$150,000.00
		Survey (\$4,000 per tract)	\$384,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$96,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County and Sponsor Owned Lands)	\$20,700,000.00
		Facility/Boat Ramp Relocations (Admin Cost)	\$3,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$96,000.00
		Subtotal	\$23,394,900.00
		Contingency	\$5,848,725.00
			*Induced Flooding Mitigation Real Estate Cost
<i>Non-Federal Total</i>			\$160,813,625.00
<i>*Cost included after total Non-Fed and Contingency Cost to Avoid Doubling Contingency</i>			
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$120,000.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$142,500.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$79,500.00
	01-0117	Boat Ramp Relocations Costs (Admin Only Not Construction Costs) (3,000 each) (AOC)	\$3,000.00
		Subtotal	\$345,000.00
		Contingency	\$86,250.00
Federal Total			\$431,250.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$161,244,875.00

Table 10-4: Galveston Ring Barrier System BCE

Galveston Ring Barrier System (Including Offats/Seawall/Channelview)			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission 40 hrs. x \$125/hr. per tract)	\$3,310,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$35,000.00
		Potential Residential Relocation Costs (\$31,000.00/ residence)	\$2,015,000.00
		Potential Residential Moving Costs (\$4,000.00/ residence)	\$260,000.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$9,690,300.00
	0105	Appraisals (\$2,500 per tract)	\$1,655,000.00
		Survey (\$4,000 per tract)	\$2,648,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$662,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County and Sponsor Owned Lands)	\$178,400,000.00
		Utility/Facility Relocations (Admin Cost)	\$117,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$662,000.00
		Subtotal	\$199,454,300.00
		Contingency	\$49,863,575.00
	Non-Federal Total		
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$827,500.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$982,500.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$497,250.00
	01-0117	Utility/Facility Relocations Costs (Admin Only Not Construction Costs) (3,000 each) (AOC)	\$117,000.00
		Subtotal	\$2,424,250.00
		Contingency	\$606,062.50
Federal Total			\$3,030,312.50
GRAND TOTAL (Federal and Non-Federal Cost):			\$252,348,187.50

Table 10-5: Clear Lake Gate System and Pump Station BCE

Clear Lake Gate System and and Pump Station			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission 40 hrs. x \$125/hr. per tract)	\$150,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$459,000.00
	0105	Appraisals (\$2,500 per tract)	\$75,000.00
		Survey (\$4,000 per tract)	\$120,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$30,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County and Sponsor Owned Lands)	\$27,000,000.00
		Utility/Facility Relocations (Admin Cost)	\$54,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$30,000.00
		Subtotal	\$27,918,000.00
		Contingency	\$6,979,500.00
	Non-Federal Total		
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$37,500.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$45,000.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$22,500.00
	01-0117	Utility/Facility Relocations Costs (Admin Only Not Construction Costs) (3,000 each) (AOC)	\$54,000.00
		Subtotal	\$159,000.00
		Contingency	\$39,750.00
Federal Total			\$198,750.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$35,028,750.00

Table 10-6: Dickinson Gate System and Pump Station BCE

Dickinson Gate System and Pump Station			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission 40 hrs. x \$125/hr. per tract)	\$20,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$61,200.00
	0105	Appraisals (\$2,500 per tract)	\$10,000.00
		Survey (\$4,000 per tract)	\$16,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$4,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County and Sponsor Owned Lands)	\$22,300,000.00
		Utility/Facility Relocations (Admin Cost)	\$39,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$3,000.00
		Subtotal	\$22,454,200.00
		Contingency	\$5,613,550.00
	Non-Federal Total		
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$5,000.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$6,000.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$8,000.00
	01-0117	Utility/Facility Relocations Costs (Admin Only Not Construction Costs) (3,000 each) (AOC)	\$39,000.00
		Subtotal	\$58,000.00
		Contingency	\$14,500.00
Federal Total			\$72,500.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$28,140,250.00

Table 10-7: South Padre Island Beach Nourishment and Sediment Management BCE

South Padre Island Beach Nourishment and Sediment Management			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission 40 hrs. x \$125/hr. per tract)	\$740,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$2,449,800.00
	0105	Appraisals (\$2,500 per tract)	\$370,000.00
		Survey (\$4,000 per tract)	\$592,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$148,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County and Sponsor Owned Lands (35% contingency used for land cost only)	\$13,000,000.00
		Utility/Facility Relocations (Admin Cost)	\$0.00
	01-0117	Title Commitment (\$1,000 per tract)	\$148,000.00
		Subtotal	\$4,262,400.00
		Contingency	\$1,065,600.00
	Non-Federal Total		
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$185,000.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$222,000.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$111,000.00
	01-0117	Utility/Facility Relocations Costs (Admin Only Not Construction Costs) (3,000 each) (AOC)	\$0.00
		Subtotal	\$518,000.00
		Contingency	\$129,500.00
Federal Total			\$647,500.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$18,975,500.00

10.2 ER COST

The Area of impacts: start at the south west area of the Gulf of Mexico near Port Mansfield, following up the coast traversing through the Gulf, bays, and the GIWW up through Galveston Bay, concluding at the Gulf Intracoastal Waterway near High Island Bolivar Peninsula. BCE include all cost associated with the acquisition of real estate requirements such as appraisal reports, survey, title, condemnation action, and administration costs. The following tables are the BCE for all ER features as listed below.

- G28 – Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection
- B2 – Follets Island Gulf Beach and Dune Restoration
- B12 – Bastrop Bay, Oyster Lake, West Bay, and Brazoria GIWW Shoreline Protection
- M8 – East Matagorda Bay Shoreline Protection
- CA5 – Keller Bay Restoration
- CA6 – Powderhorn Shoreline Protection and Wetland Restoration
- SP1 – Redfish Bay Protection and Enhancement
- W3 – Port Mansfield Channel, Island Rookery, and Hydrologic Restoration

Table 10-8: G28 – Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection BCE

G28 – Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$1,395,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$4,115,700.00
	0105	Appraisals (\$2,500 per tract)	\$697,500.00
		Survey (\$4,000 per tract)	\$1,116,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$279,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$39,591,100.00
	01-0117	Title Commitment (\$1,000 per tract)	\$279,000.00
		Subtotal	\$47,473,300.00
		Contingency	\$11,868,325.00
Non-Federal Total			\$59,341,625.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$348,750.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$697,500.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$214,250.00
		Subtotal	\$966,500.00
		Contingency	\$241,625.00
Federal Total			\$1,208,125.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$60,549,750.00

Table 10-9: B2 – Follets Island Gulf Beach and Dune Restoration BCE

B2 – Follets Island Gulf Beach and Dune Restoration			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$580,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$1,652,400.00
	0105	Appraisals (\$2,500 per tract)	\$290,000.00
		Survey (\$4,000 per tract)	\$464,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$116,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$5,567,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$116,000.00
		Subtotal	\$8,785,400.00
		Contingency	\$2,196,350.00
Non-Federal Total			\$10,981,750.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$145,000.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$162,000.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$87,000.00
	01-0117	Attorney's Opinion (\$3,300 per tract)	\$0.00
		Subtotal	\$401,500.00
		Contingency	\$100,375.00
Federal Total			\$501,875.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$11,483,625.00

Table 10-10: B12 – Bastrop Bay, Oyster Lake, West Bay, and Brazoria GIWW Shoreline Protection BCE

B12 – Bastrop Bay, Oyster Lake, West Bay, and Brazoria GIWW Shoreline Protection				
Non-Federal Cost Estimate				
	Account	Description	Amount	
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$415,000.00	
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00	
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$673,200.00	
	0105	Appraisals (\$2,500 per tract)	\$207,500.00	
		Survey (\$4,000 per tract)	\$332,000.00	
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$83,000.00	
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$5,420,000.00	
	01-0117	Title Commitment (\$1,000 per tract)	\$83,000.00	
			Subtotal	\$7,213,700.00
			Contingency	\$1,803,425.00
Non-Federal Total			\$9,017,125.00	
Federal Cost Estimate				
	Account	Description	Amount	
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$103,750.00	
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$124,500.00	
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$62,250.00	
	01-0117	Attorney's Opinion (\$3,300 per tract)	\$0.00	
			Subtotal	\$290,500.00
		Contingency	\$72,625.00	
Federal Total			\$363,125.00	
GRAND TOTAL (Federal and Non-Federal Cost):			\$9,380,250.00	

Table 10-11: M8 East Matagorda Bay Shoreline Protection BCE

M8 – East Matagorda Bay Shoreline Protection			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$75,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$153,000.00
	0105	Appraisals (\$2,500 per tract)	\$37,500.00
		Survey (\$4,000 per tract)	\$60,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$15,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$1,577,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$394,250.00
		Subtotal	\$1,577,000.00
		Contingency	\$394,250.00
Non-Federal Total			\$1,971,250.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$18,750.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$15,000.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$14,250.00
		Subtotal	\$48,000.00
		Contingency	\$12,000.00
Federal Total			\$60,000.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$2,031,250.00

Table 10-12: CA5 – Keller Bay Restoration BCE

CA5 – Keller Bay Restoration			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$35,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$107,100.00
	0105	Appraisals (\$2,500 per tract)	\$17,500.00
		Survey (\$4,000 per tract)	\$28,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$7,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$188,100.00
	01-0117	Title Commitment (\$1,000 per tract)	\$7,000.00
		Subtotal	\$389,700.00
		Contingency	\$97,425.00
Non-Federal Total			\$487,125.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$8,750.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$10,500.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$5,250.00
		Subtotal	\$24,500.00
		Contingency	\$6,125.00
		Federal Total	\$30,625.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$517,750.00

Table 10-13: CA6 – Powderhorn Shoreline Protection and Wetland Restoration BCE

CA6 – Powderhorn Shoreline Protection and Wetland Restoration			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$490,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$1,331,100.00
	0105	Appraisals (\$2,500 per tract)	\$245,000.00
		Survey (\$4,000 per tract)	\$392,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$98,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$3,279,00.00
	01-0117	Title Commitment (\$1,000 per tract)	\$98,000.00
		Subtotal	\$5,933,100.00
		Contingency	\$1,483,275.00
		Non-Federal Total	\$7,416,375.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$155,000.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$186,000.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$93,000.00
		Subtotal	\$434,000.00
		Contingency	\$108,500.00
		Federal Total	\$542,500.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$7,958,875.00

Table 10-14: SP1 - Redfish Bay Protection and Enhancement BCE

SP1 – Redfish Bay Protection and Enhancement			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$105,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$0.00
	0105	Appraisals (\$2,500 per tract)	\$52,500.00
		Survey (\$4,000 per tract)	\$84,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$21,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$2,900,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$21,000.00
		Subtotal	\$3,183,500.00
		Contingency	\$795,875.00
Non-Federal Total			\$3,979,375.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$26,250.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$31,500.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$15,750.00
		Subtotal	\$735,500.00
		Contingency	\$18,375.00
Federal Total			\$91,875.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$4,071,250.00

Table 10-15: W3 - Port Mansfield Channel, Island Rookery, and Hydrologic Restoration BCE

W3 – Port Mansfield Channel, Island Rookery, and Hydrologic Restoration			
Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	0102	Acquisition Labor for Relocation Assistance, Homeowner Negotiations, LERRD Submission (40 hrs. x \$125/hr. per tract)	\$75,000.00
	0103	Condemnation Subdivisions (\$35,000 per subdivision)	\$0.00
	0103	Condemnation (\$90,000 per tract, 17% of the private tract and 1% of County and Sponsor Land)	\$0.00
	0105	Appraisals (\$2,500 per tract)	\$37,500.00
		Survey (\$4,000 per tract)	\$60,000.00
	0112	Office Administration and Management Oversight (8 hrs. x \$125/hr. per tract)	\$15,000.00
	01-1501	Land Value Estimate (Estimated values for Private, Federal, State, County, and Sponsor Owned Lands)	\$10,105,000.00
	01-0117	Title Commitment (\$1,000 per tract)	\$15,000.00
		Subtotal	\$10,307,500.00
		Contingency	\$2,576,875.00
Non-Federal Total			\$12,884,375.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	0102	Acquisition Labor for reviewing RE Planning Documents, Verifying Ownership, Relocation Assistance, LERRD Crediting, Mapping (10 hrs. x \$125/hr. per tract)	\$21,250.00
	0105	Appraisal Reviews (10 hrs. x \$150/hr. per tract)	\$25,000.00
	0112	Office Administration and Management Oversight (6 hrs. x \$125/hr. per tract)	\$12,750.00
	01-0117	Attorney's Opinion (\$3,300 per tract)	\$0.00
		Subtotal	\$59,500.00
		Contingency	\$14,875.00
Federal Total			\$74,375.00
GRAND TOTAL (Federal and Non-Federal Cost):			\$12,958,750.00

10.3 MITIGATION COST

The mitigation cost stated in this section reflects the real estate cost required for habitate impacts due to the CSR feature. The Area of impacts: The south westerly area starts at Chocolate Bay, continuing north easterly to the Gulf Side of Galveston, then north to the City of Seabrook, then to the south east to the Bay side of the Bolivar Peninsula.

BCE include all cost associated with the acquisition of real estate requirements such as appraisal reports, survey, title, condemnation action, and administration costs. The NFS cost will be identified as a LERRD cost. The Federal cost will be accounted for as cost shared between the government and the NFS.

Table 10-16: Mitigation BCE

Non-Federal Cost Estimate			
	Account	Description	Amount
Non-Federal	01	Sievers Cove	\$4,027,250.00
		Greens Lake	\$3,305,000.00
		Horseshoe Lake-Site 1	\$1,096,500.00
		Horseshoe Lake-Site 2	\$1,019,750.00
		Horseshoe Lake-Site 3	\$204,750.00
		Seabrook	\$79,750.00
		Dickinson Bayou	\$97,000.00
		Marquette	\$1,411,000.00
		Evia Island (Oyster Reef)	\$992,250.00
		Dickinson Bayou (Oyster Reef)	\$70,375.00
		Alligator Point (Oyster Reef)	\$229,750.00
Non-Federal Total			\$12,533,375.00
Federal Cost Estimate			
	Account	Description	Amount
Federal	30	Sievers Cove	\$93,500.00
		Greens Lake	\$42,500.00
		Horseshoe Lake-Site 1	\$161,500.00
		Horseshoe Lake-Site 2	\$136,000.00
		Horseshoe Lake-Site 3	\$4,375.00
		Seabrook	\$8,500.00
		Dickinson Bayou	\$4,375.00
		Marquette	\$4,375.00
		Evia Island (Oyster Reef)	\$4,375.00
		Dickinson Bayou (Oyster Reef)	\$8,500.00
		Alligator Point (Oyster Reef)	\$4,375.00
Federal Total			\$472,375.00

GRAND TOTAL (Federal and Non-Federal Cost):	\$13,005,750.00
----------------------------------------------------	------------------------

10.4 TOTAL COST

Below are the totals for Federal and Non-Federal real estate baseline cost estimates for all CSRMs, SPI and ER features.

Table 10-17: CSRMs Total Costs

CSRM Element with 25% Contingency	Non-Fed	Fed	Total Cost per Measure
West Galveston Beach and Dunes*	\$232,119,625.00	\$2,338,125.00	\$234,457,750.00
Bolivar Beach and Dunes**	\$145,811,250.00	\$4,646,562.50	\$150,457,812.50
Bolivar Roads Gate System***	\$160,813,625.00	\$431,250.00	\$161,244,875.00
Galveston Ring Levee System	\$249,317,875.00	\$3,030,312.50	\$252,348,187.50
Clear Lake Gate System and Pump Station	\$34,897,500.00	\$131,250.00	\$35,096,250.00
Dickinson Bay Gate System and Pump Station	\$28,067,750.00	\$72,500.00	\$28,140,250.00
Totals	\$851,027,625.00	\$10,650,000.00	\$861,677,625.00
*Including \$1,370,264.00 CBRA			
**Including \$11,970,667 CBRA			
*** Includes induced flooding mitigation real estate cost			

Table 10-18: SPI Total Costs

SPI Element with 35% Contingency	Non-Fed	Fed	Total Cost per Measure
South Padre Island Beach Nourishment and Sediment Management****	\$18,328,000.00	\$647,500.00	\$18,975,500.00
Totals	\$18,328,000.00	\$647,500.00	\$18,975,500.00
****Only Segments 3, 4, and 5			

Table 10-19: ER Total Costs

ER Element with 25% Contingency	Non-Fed	Fed	Total Cost per Measure
B2	\$10,981,750.00	\$501,875.00	\$11,483,625.00
B12	\$9,017,125.00	\$363,125.00	\$9,380,250.00
CA5	\$487,125.00	\$30,625.00	\$517,750.00
CA6	\$7,416,375.00	\$1,015,625.00	\$8,432,000.00
G28	\$59,341,625.00	\$1,208,125.00	\$60,549,750.00
M8	\$1,971,250.00	\$60,000.00	\$2,031,875.00
SP1	\$3,979,375.00	\$52,500.00	\$4,031,875.00
W3	\$12,884,375.00	\$42,500.00	\$12,926,875.00
Totals	\$106,079,000.00	\$3,274,375.00	\$109,353,375.00

Table 10-20: West Shore of Galveston Bay Non-Structural Measures Total Costs

West Shore of Galveston Bay Non-Structural Measures with 25% Contingency	Non-Fed	Fed	Total Cost per Measure
Eagle's Point to Morgans Point	\$14,182,500.00	\$4,812,500.00	\$18,995,000.00
Totals	\$14,182,500.00	\$4,812,500.00	\$18,995,000.00

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11.0 PUBLIC LAW 91-646 RELOCATION ASSISTANCE

11.1 LANDOWNER ASSISTANCE FOR NONSTRUCTURAL MEASURE- CHANNELVIEW

Many of the residential homes in the Channelview neighborhood are already raised to prevent inundation from coastal storm surges. However, a portion of the homes on the interior streets are still slab on grade homes. Due to the close proximity of residential structures outside of the floodwall, and due to concerns with wave action deflecting off the floodwall, mitigation measures are being included in the recommendation to address the uncertainty surrounding the issue.

65 homes were identified as possible voluntary home elevations, the uncertainty associated with successful implementation of raising houses caused this option to be set aside for nonstructural buyouts. The higher cost of buying out homes is carried forward in the recommendation. In the event home relocations are required, the NFS will comply with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 (PL 91-646). In PED, the existing surge risk, and induced surge risk from the floodwall, will be further investigated to determine if the nonstructural mitigation measures need to be implemented.

The benefits of Title II of the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 (PL 91-646), as amended, are applicable for this project. Title II requires that persons and businesses displaced by a Federal project be given advisory services and assistance in the location of replacement dwellings and/or businesses.

Under Title II, displaced persons are entitled to reimbursement for actual and reasonable moving of personal property, differential housing payment, and incidental costs associated with the relocation. Differential housing payment is a payment made by the Government when the compensation paid for the property being acquired is not sufficient to cover the costs of a replacement dwelling for the displaced persons. Differential payments are capped at \$34,000 for homeowners and \$10,200 for tenants. Commercial businesses are entitled to receive advisory services, reimbursement for actual reasonable moving costs, reestablishment costs, which are capped at \$10,000, and certain reasonable and necessary incidental costs associated with the relocation. For purposes of this study, the estimate of relocation for business includes all of these costs and was estimated to be approximately \$100,000 per industrial business and \$50,000 per commercial business. The NFS will be required to perform and pay for PL 91-646 relocations, which will be eligible for LERRD crediting.

Availability of Homes Survey

During the development of the real estate base line cost estimate for the Channelview measure, a survey of available homes was conducted utilizing the Houston Association of Realtor database.

The geographic area surveyed was all of Galveston Island, from Galveston Bay/East Beach south to Galveston Island State Park, and Tiki Island across West Bay. All single-family detached residential properties listed for sale in the geographic area were included in the analysis. Also included in the analysis were all available listings and listings currently under contract. As of June 29, 2020, listing data revealed a total of 327 listings, of which 148 were under contract and 179 were available. The listings ranged from 620 SF to 7,802 SF, with an average of 2,234 SF.

The 65 improved properties for the subject neighborhood would represent approximately 36.31% of all available listings (20% of all listings). As a point of reference, pending listings represented about 45% of the total listings seventy-eight properties are listed under \$250,000. Of those, forty-eight were under contract. Ocean-front and Lake-front listings are included in the analysis. These properties are not considered to be ideal replacements for any of the subject neighborhood tracts but could be utilized if necessary. Properties in the East Beach Area appeared to represent the upper end of the value range for water-front properties. Based on the subject property's characteristics and the available properties, it appears first row and bay frontage properties would be the most difficult and costly to replace.

It appears as if the current availability would support a mass-buyout of the neighborhood. At the time of the development of this report, the real estate market is near equilibrium. With the added influx the proposed buyout would bring, it would be expected to steer the market into a strong seller's market. This would result in an expectation of sale values at, or near list prices, in addition to a potential increase in average list prices.

11.2 LANDOWNER ASSISTANCE FOR NON-STRUCTURAL IMPROVEMENTS-WEST SHORE OF GALVESTON BAY STRUCTURAL MEASURES

Residential

Property owner/occupants of eligible residential structures who willingly participate in the residential elevation program are not considered displaced persons (in accordance with 49 CFR Part 24), and therefore are not entitled to receive relocations assistance benefits. However, displaced tenants of eligible residential structures to be elevated, are eligible for temporary relocations assistance benefits. Eligible tenants that temporarily relocate would be reimbursed for the cost of temporary alternate housing, meals and incidentals (such as laundry services), and the fees for disconnection and connection of utilities at the temporary residence. Alternate housing could be hotels or apartments, depending upon availability in the community. All temporary housing costs would need to be approved in advance by the NFS after first obtaining the prior written approval of USACE. Hotel costs would be reimbursed based on the General Services Administration per diem rates for Texas. Apartment costs would be based on market rents. All conditions of temporary relocation must be reasonable. Temporary relocation should not extend

beyond one year before the person is returned to his or her previous unit or location. Any residential tenant who has been temporarily relocated for more than one year must be offered permanent relocation assistance which may not be reduced by the amount of any temporary relocation assistance previously provided. At a minimum, tenants shall be provided the following: reimbursement for all reasonable out-of-pocket expenses incurred in connection with the temporary relocation, including the cost of moving to and from the temporarily occupied housing, and any increase in monthly rent or utility costs at such housing. Tenants are entitled to receive appropriate advisory services, including reasonable advance written notice of the following:

- Date and approximate duration of the temporary relocation;
- Address of the suitable decent, safe, and sanitary dwelling to be made available for the temporary period;
- Terms and conditions under which the tenant may lease and occupy a suitable decent, safe and sanitary dwelling in the building/complex upon completion of the project; and
- Provisions of reimbursement for all reasonable out of pocket expenses incurred in connection with the temporary relocation as noted above.
- In addition to relocation advisory services, displaced tenants may be eligible for other relocation assistance including relocation payments for moving expenses and replacement housing payments for the increased costs of renting or purchasing a comparable replacement dwelling.

All temporary housing costs must be approved in advance by the NFS. In order for the NFS to receive credit towards their cost-share obligations, USACE must provide prior written approval for those expenditures.

Non-Residential

It is assumed that for these measures, there will be no requirements for temporary relocation. In the event that relocations are required, in accordance with 49 CFR Part 24 (Subpart A, Section 24.2(a)(9)(ii)(D), property owner/occupants of non-residential structures who willingly participate in the program are not considered displaced, and therefore are not entitled to receive relocations assistance benefits. Additionally, businesses will not receive benefits for temporary loss of operation during construction. Business owners who are tenants of the structure, and who must relocate temporarily during construction, could receive relocation assistance advisory services and moving expenses, in accordance with 49 CFR Part 24.

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12.0 MINERAL AND ENERGY ACTIVITY

Preliminary research was conducted to identify mineral and energy activity that may impact project features. This research was done utilizing the Texas Railroad Commission (TRRC) website. There are multiple areas within the vicinity of the project features where mineral extraction activity is occurring, mostly oil and gas. The majority of the proposed alignment for the CSR features are located mainly in highly developed areas within the Harris/Galveston areas. In these areas mineral extraction is largely completed.

It is anticipated that if any future extraction were to take place, directional drilling from the existing well sites would be employed in order to reduce extraction costs avoid existing structures and not impact the project. ER features are mainly located along the Texas coastline and are mostly owned by State or Federal agencies, which have strict regulations regarding the surface extraction of minerals. As stated above if third-party extraction were to occur, directional extraction technology would likely be used in the area, resulting in minimal onsite surface impacts. In addition, to the extent that 33 USC 408 applies, USACE, through its permission process, will have an opportunity to affect any proposed mineral extraction that would impact the Federal project so as to prevent injury to the public interest or impairment to the usefulness of the project.

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13.0 ASSESSMENT OF NON-FEDERAL SPONSOR LAND ACQUISITION CAPABILITIES

NFSs have not been identified for the construction and OMRR&R for the multiple project measure. Therefore, an assessment of each NFS's Real Estate Capabilities has not been sent to the NFS at this phase of the study. An assessment of each NFS's Real Estate Capabilities will be conducted when a construction NFS is identified. An example of a NFS Capabilities Assessment is shown below.



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF: USACE-SWG-RE

**Coastal Texas Protection and Restoration Study
NON-FEDERAL SPONSOR**

**ASSESSMENT OF NON-FEDERAL SPONSOR'S
REAL ESTATE ACQUISITION CAPABILITY**

I. Legal Authority:

- a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? (yes/no)
- b. Does the sponsor have the power of eminent domain for this project? (yes/no)
- c. Does the sponsor have "quick-take" authority for this project? (yes/no)
- d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary? (yes/no)
- e. Are any of the lands/interests in lands required for the project unable to be condemned by the sponsor? (yes/no)

II. Human Resource Requirements:

- a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including Public Law 91-646 (Home Relocation Assistance), as amended? (yes/no)
- b. If the answer to II.a. is "yes," has a reasonable plan been developed to provide such training? (yes/no)

- c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? (yes/no)
- d. Is the sponsor's projected in-house staffing level sufficient considering its other work load, if any, and the project schedule? (yes/no)
- e. Can the sponsor obtain contractor support, if required in a timely fashion? (yes/no)
- f. Will the sponsor likely request USACE assistance in acquiring real estate? (yes/no) (If "yes," provide description)

III. Other Project Variables:

- a. Will the sponsor's staff be located within reasonable proximity to the project site? (yes/no)
- b. Has the sponsor approved the project/real estate schedule/milestones? (yes/no)

IV. Overall Assessment:

- a. Has the sponsor performed satisfactorily on other USACE projects? (yes/no/not applicable)
- b. With regard to this project, the sponsor is anticipated to be: highly capable/fully capable/moderately capable/marginally capable/ insufficiently capable. (If sponsor is believed to be "insufficiently capable," provide explanation)

V. Coordination:

- a. Has this assessment been coordinated with the sponsor? (yes/no)

b. Does the sponsor concur with this assessment? (yes/no)

Accepted by the Non-Federal Sponsor:

(Signature)

(Title)

(Date)

Prepared by:

Kenny Pablo
Realty Specialist
Real Estate Division
Galveston District
US Army Corps of Engineers

Reviewed by:

BRIAN MURPHY
Branch Chief, Support Services Branch
Real Estate Division
Galveston District
US Army Corps of Engineers

Approved by:

TIMOTHY J. NELSON
Chief, Real Estate Division
Galveston District
US Army Corps of Engineers

14.0 ZONING IN LIEU OF ACQUISITION

There is no zoning in lieu of acquisition anticipated for this project.

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15.0 UTILITIES/UTILITIES/PIPELINE RELOCATION AND REMOVALS

Texas Railroad Commission database was used to obtain pipeline information for impacted pipeline analysis. This information included the pipeline’s approximate location and orientation by coordinates, system and subsystem names, ownership, operator, diameter, and product carried. However, it did not provide the pipeline depth. Because only a nominal amount of the project areas is within USACE’s regulatory domain, no information on pipeline depth was immediately available. There was no other expedient vehicle by which the pipeline depths could be readily assessed. Most oil and gas pipelines are typically buried at a depth of 3 to 6 feet, as reported by the industry.

One hundred ninety-three utility/pipeline relocations have been identified within the Recommended Plan’s footprint. At the beginning of the PED phase, the NFS will be provided with an anticipated list of pipelines, utilities, and structures to be removed or relocated, at which point the NFS will need to provide as-builts for known pipelines, utilities, and structures for review and confirmation by the PDT. All structural information of pipelines, utilities, and structures will need to be confirmed in the PED phase. It will be the responsibility of NFS to ensure all impacted pipelines have been removed/relocated prior to advertisement of the first construction contract.

The Recommended Plan may also impact existing pedestrian walkovers and vehicular access points designated by TXGLO. Sixty-one pedestrian walkovers and sixty-five vehicular access points have been identified as possibly being impacted within the Bolivar and West Galveston beach and dune features. Owners of privately owned permitted pedestrian walkovers, impacted by the beach and dune feature will be compensated for the relocation of their structure. The procees to determine if an owner of a pedestrian walkover structure will be compentated will be evaluated on a case by case basis.

The NFS will be responsible for the relocation cost of pedestrian walkover and vehicular access points impacted by the Recommend Plan. All interior drainage impacted by the dune and beach features will be cost shared between the Government and NFS. Impacted pipelines, utilities, and structures are shown in the tables below. The total costs for relocations are estimated to be \$75,281,000 and are the responsibility of the non-federal sponsor. Relocation costs include construction costs only, as there are no lands required for relocations.

Table 16-1: Pipeline Removal/Relocations

Feature	Size/Type	Owner
Bolivar	6”Natural Gas	CENTANA INTRASTATE PIPELINE, LLC
Bolivar	4” Crude	BP PIPELINES (NORTH AMERICA),INC
Bolivar	4” Crude	BP PIPELINES (NORTH AMERICA),INC
Bolivar	6” Natural Gas	CENTANA INTRASTATE PIPELINE, LLC

Bolivar	16" Natural Gas	WILLIAMS FIELD SERVICES COMPANY
Bolivar	10" Natural Gas	GATEWAY OFFSHORE PIPELINE CO.
Bolivar	8" Natural Gas	IMPACT MIDSTREAM, LLC
Bolivar	24" Crude	ENTERPRISE PRODUCTS OPERATINGLLC
Galveston	6" Natural Gas	EMERALD GATHER AND TRANS, LLC
Galveston	14" Natural Gas	AMOCO PIPELINE COMPANY
*Galveston	0 Natural Gas	NICOR EXPLORATION COMPANY
Galveston	14" Natural Gas	AMOCO PIPELINE COMPANY
Galveston	14" Crude	PANTHER OPERATING COMPANY, LLC
Galveston	6" Natural Gas	EMERALD GATHER AND TRANS, LLC
Galveston	14" Natural Gas	AMOCO PIPELINE COMPANY
Galveston	4" Natural Gas	HOUSTON PIPELINE COMPANY LP
Clear Creek	6" Propylene	ExxonMobil
Clear Creek	12" Gas	NuStar Logistics
Clear Creek	12" Pipeline	Magellan Pipeline Co
Clear Creek	6" Ethylene	UCAR Pipeline Incorp.
Clear Creek	Unknown	Enterprise Texas Pipeline
Clear Creek	12"	Seadrift Pipeline Corp
Clear Creek	Unknown	Lavaca Pipeline Co.
Dickinson Bayou	6" Propylene	Flint Hills Resources
Dickinson Bayou	12" Gas	NuStar Logistics
Dickinson Bayou	12" Pipeline	Magellan Pipeline Co.
Dickinson Bayou	6" Ethylene	UCAR Pipeline Incorp.
Dickinson Bayou	Unknown	Enterprise Texas Pipeline
Dickinson Bayou	12"	Seadrift Pipeline Corp
Dickinson Bayou	Unknown	Lavaca Pipeline Co.

*NICOR EXPLORATION COMPANY was listed in the TRRC database as 0" diameter natural gas pipeline that is in service during preliminary research. Additional investigation will be required in PED Phase.

Table 16-2: Utilities- Overhead (OH) Electrical Line Relocations

Feature	Relocations	Quantity Impacted	Unit	Pipeline/Utility Notes
Galveston Ring Barrier System	Relocate OH Electrical Line with 11 poles	1100		
	Relocate OH Electrical Line with 2 poles	200	LF	Line along 3005
	Relocate OH Electrical Line with 2 poles	200	LF	Line along Stewart Rd South
	Raise OH Electrical/Relocate 1 Tower	1,000	LF	Line along Stewart Rd North
	Relocate OH Electrical Line with 3 poles	600	LF	Raise OH Electrical between I45 & Railroad
	Relocate OH Electrical Line with 4 poles	350	LF	Line within Perm footprint along railroad @ Harborside
	Relocate OH Electrical Line with 2 poles	200	LF	West of 77th St
	Relocate OH Electrical Line with 3 poles	300	LF	South side Harborside at 77th St
	Relocate OH Electrical Line with 8 poles	800	LF	77th St at Railroad
	Relocate OH Electrical Line with 8 poles	780	LF	Port Industrial @ Sulfur Facility
	Relocate OH Electrical Line with 6 poles	700	LF	16th to 14th street
	Boliver Dune	Underground Electrical	300	LF
Raise Overhead Electrical Line @ Rettilon Rd		150	LF	Raise OH electrical eastside of Rettilon Rd

Table 16-3: Utilities- Water Mains Removal/Relocations

Feature	Relocations	Quantity Impacted	Unit
Galveston Ring Barrier System	30" 59th	140	
	20" 59th	100	LF
	20" with Sewer Plant footprint	1020	LF
	30" Port	440	LF
	16" Port	70	LF
	20" Port	2000	LF
	12" Port	500	LF
	16" 21st	100	LF
	8" 20th	150	LF
	6" UTMB	100	LF
	6" Yacht Club	350	LF
	8" Ferry Rd	550	LF
	6" Ferry Rd	100	LF
	24" Natural Gas Pipeline	600	LF

Table 15-4: Utilities- Sanitary Sewer Removal/Relocations

Feature	Relocations	Quantity Impacted	Unit
Galveston Ring Barrier System	Remove 27" San. Sewer	230	
	Remove 10" San. Sewer	1700	LF
	Remove 12" San. Sewer	160	LF
	Remove 10" San. Sewer	180	LF
	Remove 30" San. Sewer	240	LF
	Remove 30" San. Sewer	240	LF
	Remove 42" San. Sewer	80	LF
	Remove 54" San. Sewer	450	LF
	Remove 24" San. Sewer	100	LF
	Remove 8" San. Sewer	470	LF
	Remove 10" San. Sewer	470	LF
	Remove 12" San. Sewer	100	LF
	Sanitary Sewer Manholes 3' to 10' Depth	54	LF
	8" San. Sewer	110	LF
	8" San Sewer Harborside Heliport	250	LF
	8" San Sewer Ferry Rd	100	LF
	Sanitary Sewer Manholes	7	LF

Table 15-4: Utilities- Fiber Optic/Structure

Feature	Relocations	Quantity Impacted	Unit	Pipeline/Utility Notes
Galveston Dune System	14" Crude Pipeline	600	LF	Gas line @ 7 Mile Rd
Gate Crossing	Boat Ramp Relocation	1	LS	Existing Jetty Boat Ramp

Attorney Opinions of Compensability were not done at this phase of the Study. The NFSs will perform these relocations as a part of their responsibility under the PPA. The Government will make a final determination of the relocations necessary for the construction, operation and maintenance of the project during the design phase and will complete Final Attorney Opinions of Compensability as required by Chapter 12 of ER 405-1-12.

(NOTE: The remainder of this page intentionally left blank.)

16.0 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE OR OTHER ENVIRONMENTAL CONTAMINANTS

Investigations indicated no hazardous, toxic, radioactive waste (HTRW) areas are within or adjacent to the proposed project areas that could impact this project. Based upon these findings, the potential of encountering HTRW within the proposed project area is considered low.

(NOTE: The remainder of this page intentionally left blank.)

17.0 SPONSOR NOTIFICATIONS OF RISKS.

Since there has yet to be identified NFSs for proposed project beyond GLO, a letter has not been sent to the NFS advising of the risks of acquiring lands prior to the signing of the PPA. An example of this letter is provided below.

18.0 TIMBER RIGHTS

Timber rights do not apply to this project.

(NOTE: The remainder of this page intentionally left blank.)

19.0 LANDOWNER/PUBLIC ATTITUDES

At this time the content of the information presented to the public has been conceptual and general in nature. It is reasonable to suggest that the general public is in favor of flood risk reduction and environmental restoration projects. The PDT has taken a proactive approach engaging the public, resource agencies, industry, local government, and other interested parties in the Coastal Texas Study planning process. This included regular and continued coordination over the five-year study period, starting in 2014 with a series of Scoping Meetings and extending through a series of Virtual Public Meetings to review and finalize the Draft Feasibility Report and Draft EIS in 2020. The proactive public engagement included:

- Eight scoping meetings
- Seven public meetings
- Twenty community-based work group sessions
- Three open houses
- Six virtual public meetings
- Sixty briefing sessions

A total of 2,108 scoping comments, letters, and emails were received during the comment period, with the vast majority of the comments submitted by non-governmental organizations (NGOs). The top five themes identified from the scoping comments included:

1. Address impacts due to human development and population growth.
2. Significant natural resources that could be negatively impacted by a coastal barrier risk reduction system.
3. Changes to natural resources should focus on nonstructural solutions and disclose biological effects.
4. Solutions must protect the coastal environment and must disclose biological effects.

Alternatives should include nature-based solutions that improve access to outdoor recreation and conserves Texas's diverse coastal ecosystems.

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EXHIBIT A, FIGURES (ADDITIONAL REAL ESTATE MAP BOOKS AND CAN BE FOUND IN APPENDIX "F" ANNEX 1 & 2)

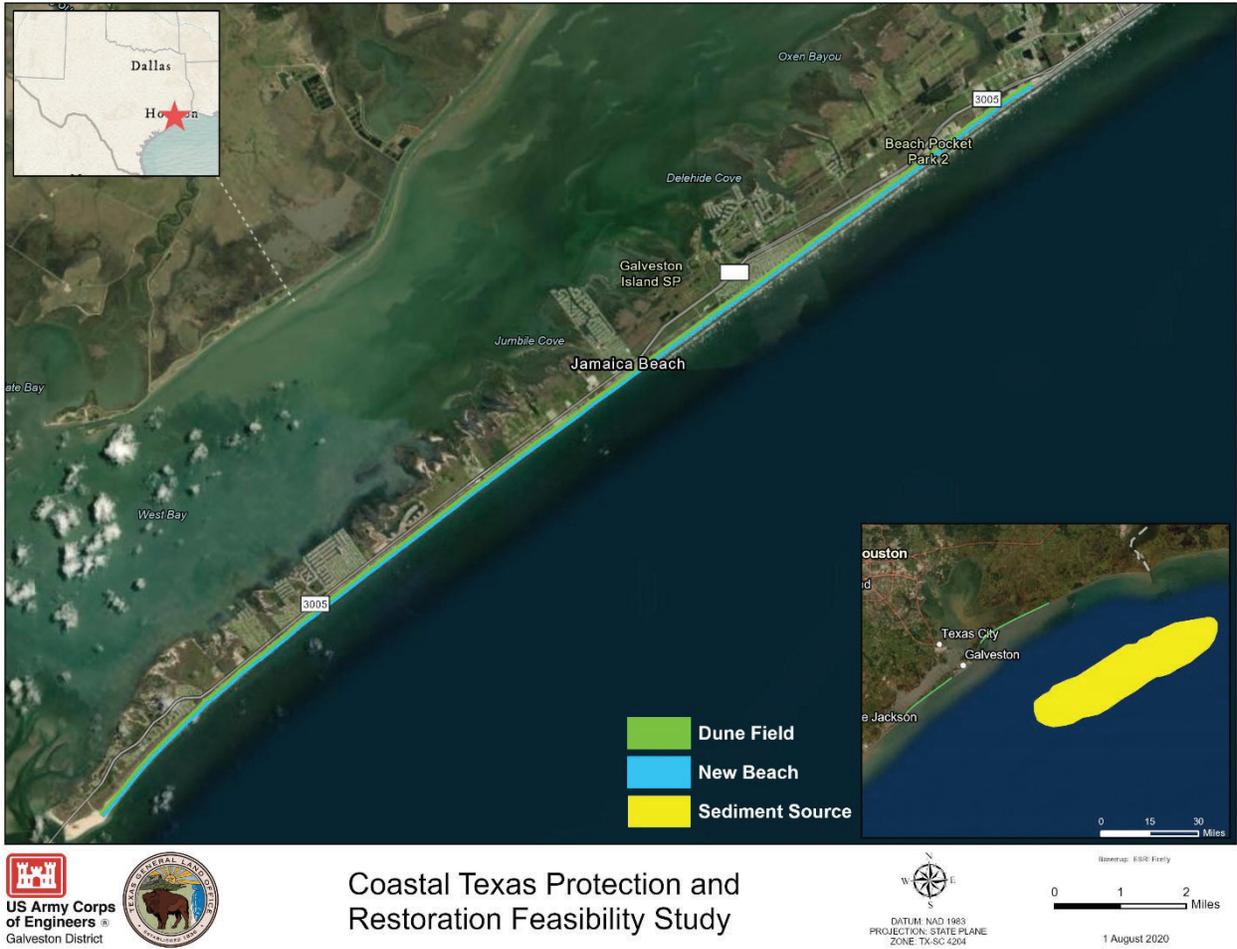


Figure 1: West Galveston Beach and Dune System

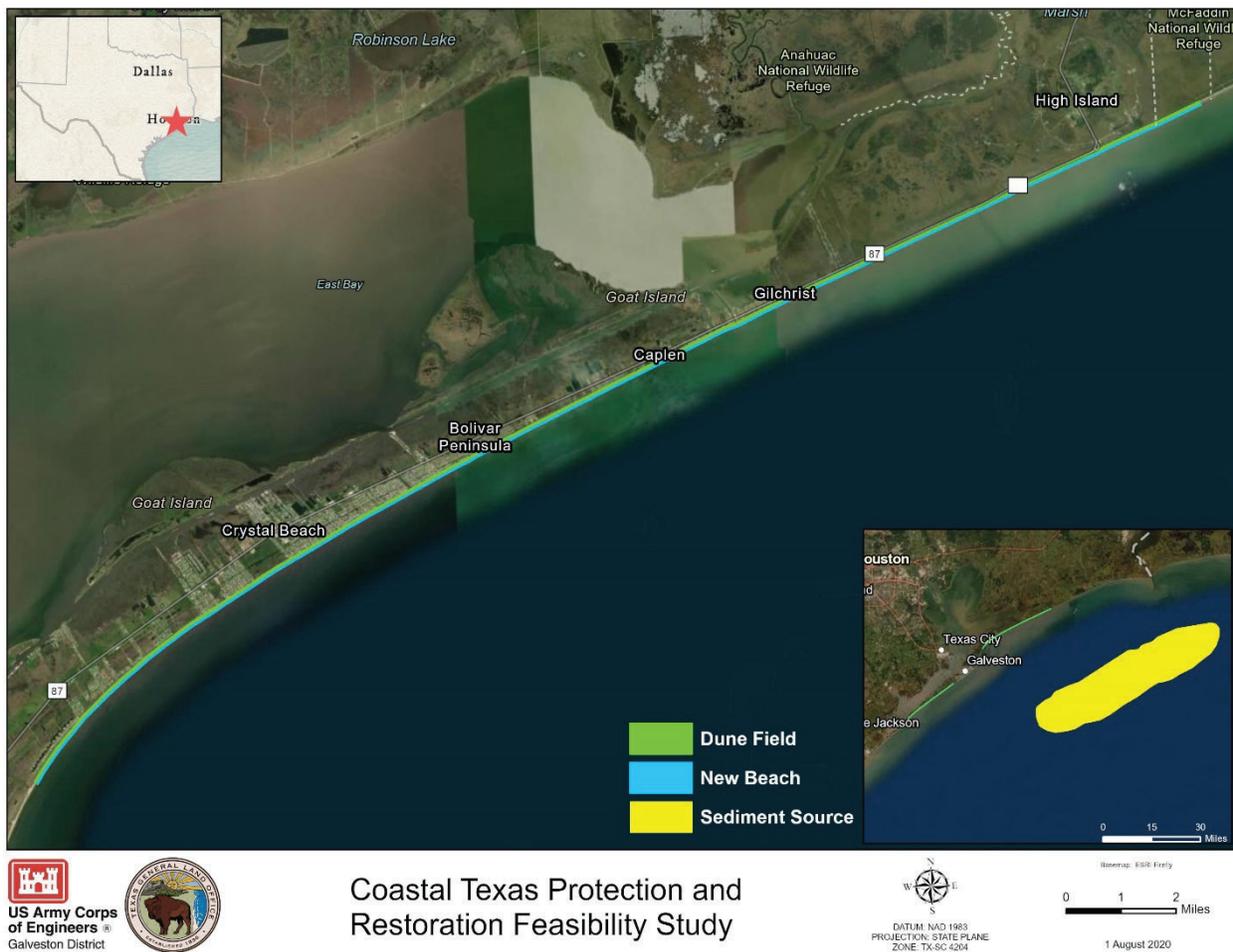


Figure 2: Bolivar Beach and Dune System

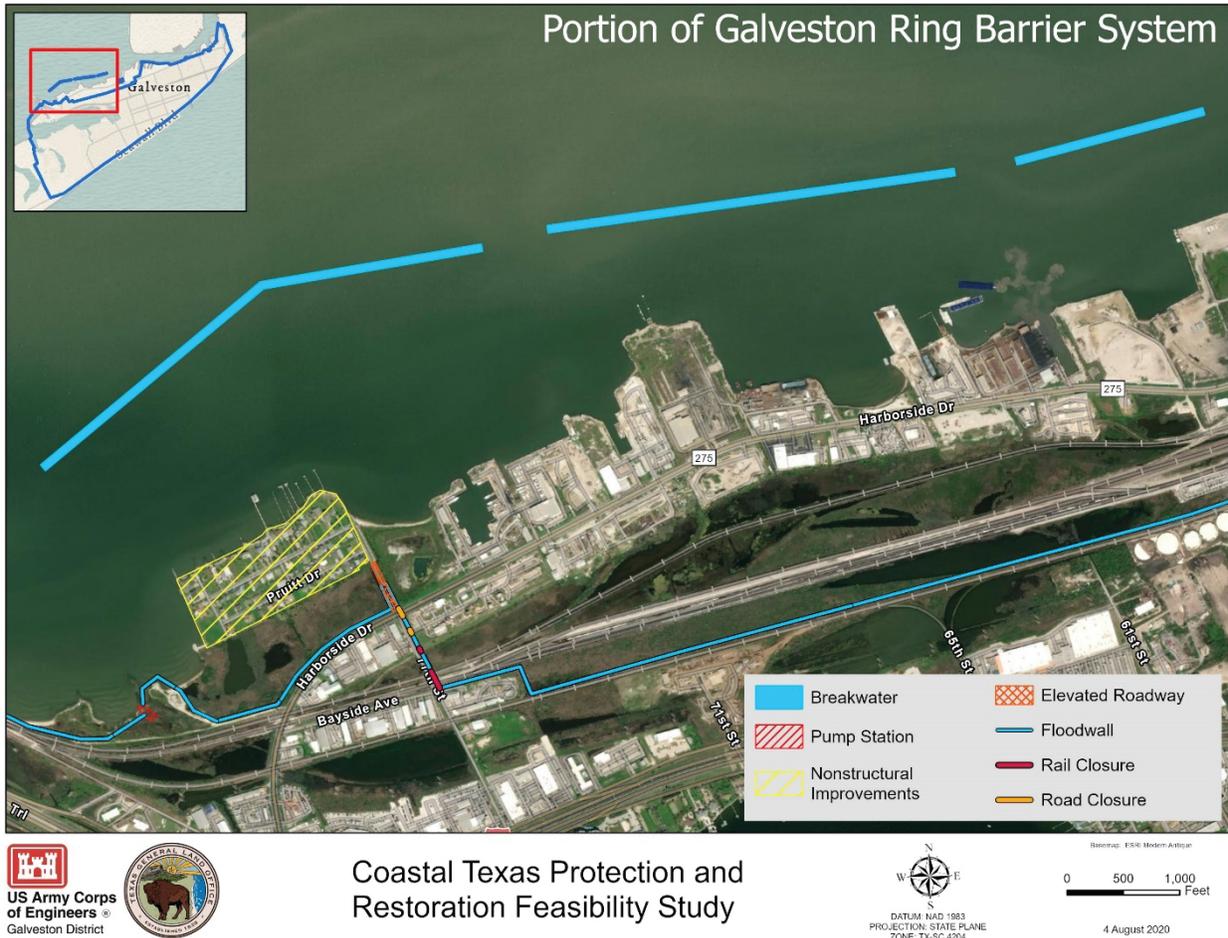
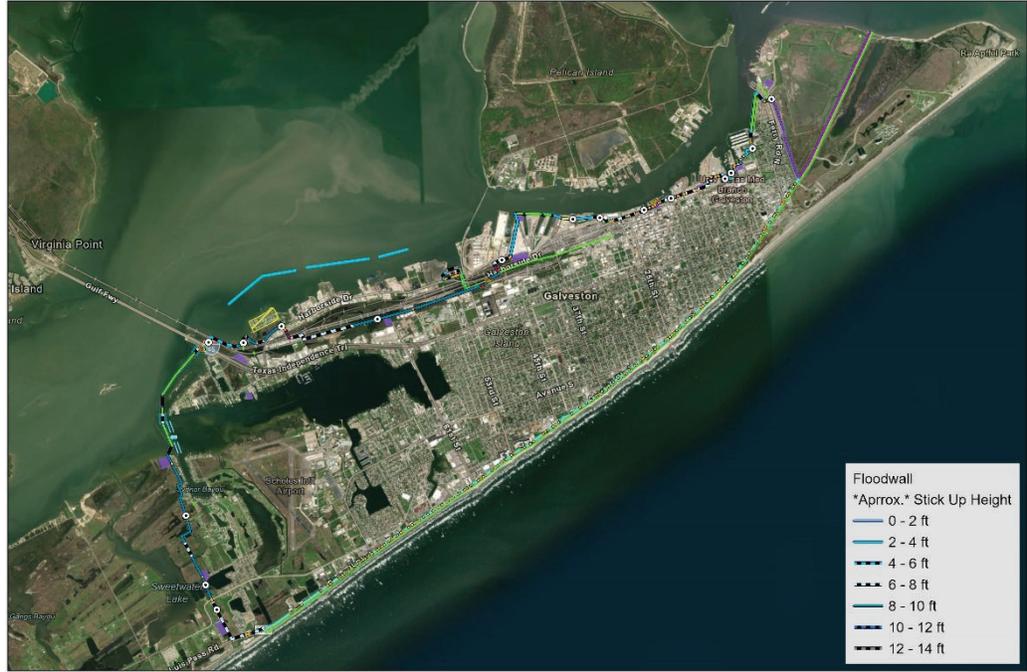


Figure 3: Channelview Breakwaters

Coastal Texas
Protection and
Restoration
Feasibility Study

Galveston Ring
Barrier System

- ⊙ Drainage Structure
- Combi-Wall
- Seawall Improvement
- Circulation Gate
- Navigation Gate
- New Channel
- Levee
- Transportation Access
- Access Gate
- Rail Closure
- Road Closure



- ▨ Drainage Mitigation
- ▨ Elevated Roadway
- ▨ Nonstructural Improvements

- ▨ Pump Station
- ▨ Breakwater
- ▨ Cofferdam
- ▨ Temporary Staging
- ▨ Temporary Easement
- ▨ Permanent Easement

DATUM: NAD 1983
PROJECTION: STATE PLANE
ZONE: TX-SC 4204

Figure 4: Galveston Ring Barrier System

Bolivar Roads Gate System

-  Levee Tie-In
-  Combi-wall Tie-In
-  Anchorage Areas
-  Sector Gates, Vertical Lift Gates, Shallow Water Environmental Gates
-  Scour Protection
-  New Channel Lines
-  Portion of Existing Channel Lines
-  New Channel
-  Boat Ramp and Parking
-  Galveston Island Control / Visitor Center
-  Bolivar Auxiliary Control Center
-  Permanent Footprint
-  Temporary Work Area Footprint



Coastal Texas Protection and Restoration Feasibility Study



 Datum: NAD 1983
 Projection: STATE PLANE
 Zone: TX-SC 4204

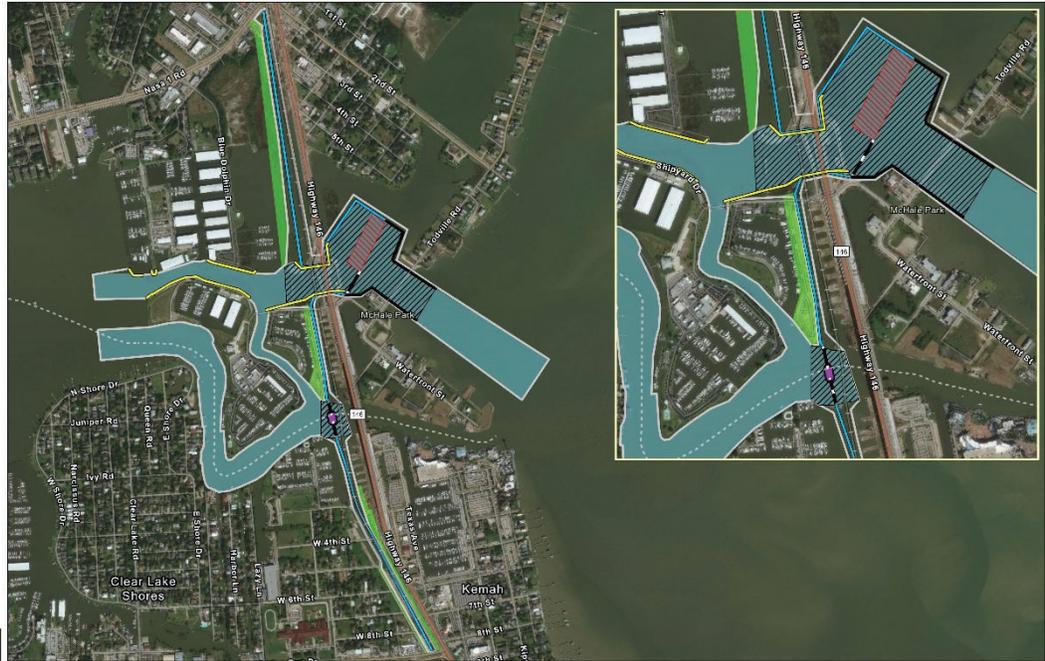


 3 August 2020

Figure 5: Bolivar Roads Gate System

Clear Lake Gate System

-  Bulkhead
-  Floodwall
-  Shoreline Stabilization
-  Circulation Gates
-  Navigation Gate
-  Pump Station
-  Scour Protection
-  Dredge Area
-  Permanent Footprint
-  Temporary Work Footprint



Coastal Texas Protection and Restoration Feasibility Study

DATUM: NAD 1983
 PROJECTION: STATE PLANE
 ZONE: TX-SC 4204



1 August 2020

Figure 6: Clear Lake Gate System



Coastal Texas Protection and Restoration Feasibility Study

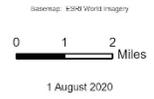


Figure 8: West Galveston Bay Nonstructural



Coastal Texas Protection and Restoration Feasibility Study



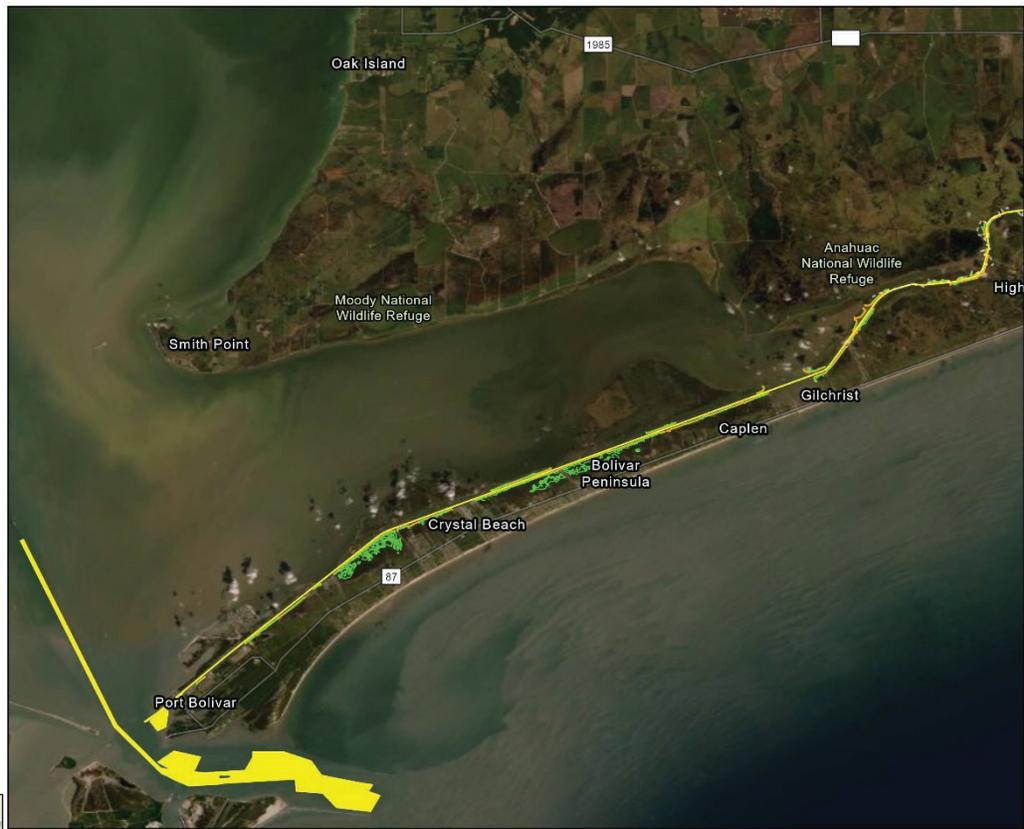
11 August 2020

Figure 9: South Padre Island Beach Nourishment and Sediment Management

Ecosystem Restoration

G28 - Bolivar GIWW Shoreline and Island Protection

-  Sediment Source
-  Island Restoration
-  Oyster Reef Scaling
-  Revetment / Breakwater
-  Wetland / Marsh Restoration



Coastal Texas Protection and Restoration Feasibility Study


 Datum: NAD 1983
 Projection: State Plane
 Zone: TX-SC 4204

 1 August 2020

Figure 10: ER G-28 Bolivar GIWW Shoreline and Island Protection

Ecosystem Restoration

G28 - Galveston GIWW Shoreline and Island Protection

-  Sediment Source
-  Island Restoration
-  Oyster Reef Scaling
-  Revetment / Breakwater
-  Wetland / Marsh Restoration



Coastal Texas Protection and Restoration Feasibility Study



Figure 11: ER G-28 Galveston GIWW Shoreline and Island Protection

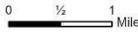
Ecosystem Restoration

B2 - Follets Island Gulf Beach and Dune Restoration

-  Dune and Beach Restoration
-  Sediment Source



Coastal Texas Protection and Restoration Feasibility Study

 DATUM: NAD 1983
 PROJECTION: STATE PLANE
 ZONE: TX-SC 4204
 1 August 2020

Figure 12: ER B-2 Follets Island Gulf Beach and Dune Restoration



Coastal Texas Protection and Restoration Feasibility Study




 DATUM: NAD 1983
 PROJECTION: STATE PLANE
 ZONE: TX-SC 4204
 1 August 2020

Figure 13: ER B-12 Bastrop Bay, Oyster Lake, West Bay, and GIWW Shoreline Protection

Ecosystem Restoration

CA5 - Keller Bay Restoration

-  Revetment / Breakwater
-  Oyster Reef Scaling



Coastal Texas Protection and Restoration Feasibility Study

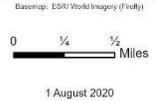


Figure 14: ER CA-5 Keller Bay Restoration

Ecosystem Restoration

CA6 - Powderhorn Shoreline Protection and Wetland Restoration

-  Revetment / Breakwater
-  Wetland / Marsh Restoration
-  Sediment Source



Coastal Texas Protection and Restoration Feasibility Study

DATUM: NAD 1983
PROJECTION: STATE PLANE
ZONE: TX-SC 4004



1 August 2020

Figure 15: ER CA-6 Powderhorn Shoreline Protection and Wetland Restoration

Ecosystem Restoration

M8 - East Matagorda Bay Shoreline Protection

-  Island Restoration
-  Revetment / Breakwater
-  Wetland / Marsh Restoration
-  Oyster Reef Scaling
-  Sediment Source



Coastal Texas Protection and Restoration Feasibility Study

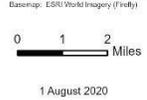
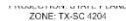


Figure 16: ER - M-8 East Matagorda Bay Shoreline Protection



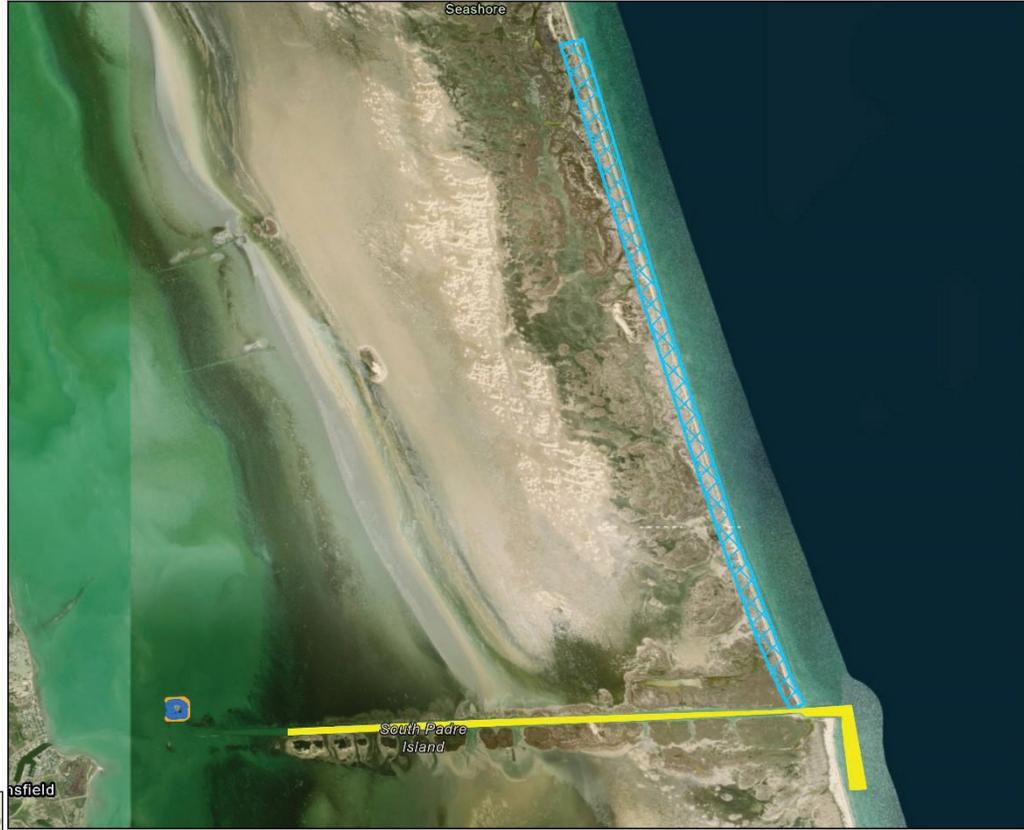
1 August 2020

Figure 17: ER - SP1 Redfish Bay Protection and Channel Enhancement

Ecosystem Restoration

W3 -
Port Mansfield
Channel, Island
Rookery, and
Hydrologic
Restoration of
the Laguna Madre

-  Island Restoration
-  Revetment / Breakwater
-  Dune and Beach Restoration
-  Sediment Source



Coastal Texas Protection and Restoration Feasibility Study

Basemap: ESRI World Imagery (7/2017)



DATUM: NAD 1983
PROJECTION: STATE PLANE
ZONE: TX-SC 4004

0 1/2 1 Miles

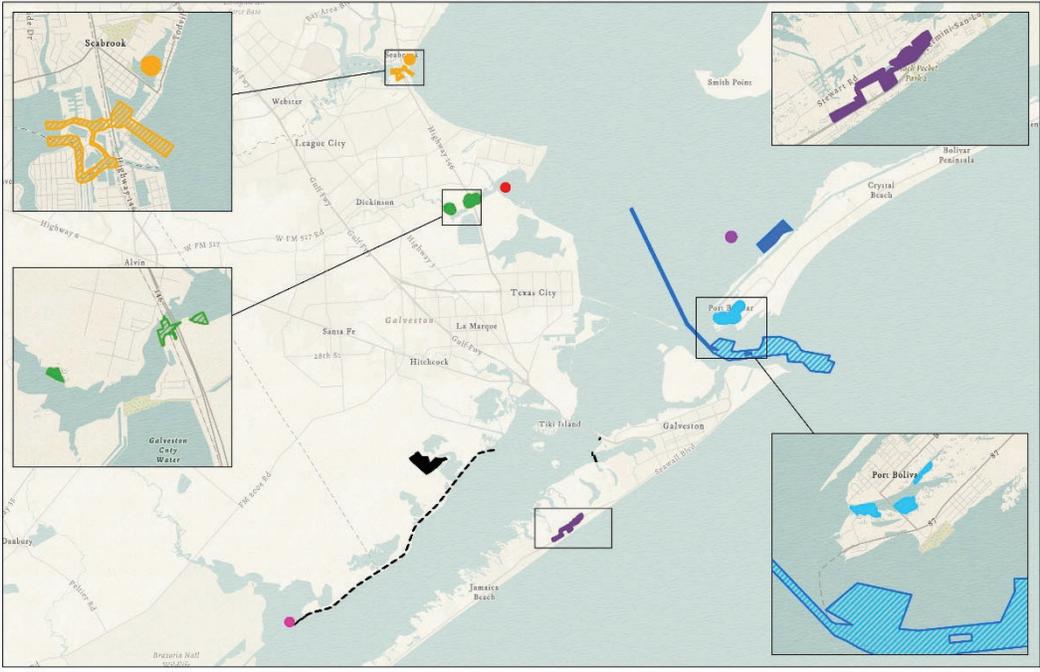
1 August 2020

Figure 18: ER - W-3 Port Mansfield Channel, Island Rookery, and Hydrologic Restoration of Laguna Madre

Mitigation and Sediment Source Sites

- Dickinson Bayou
- Dickinson Bayou Source
- Greens Lake
- Greens Lake Source
- Horseshoe Lake
- Sievers Cove
- Horseshoe Lake and Sievers Cove Source
- Seabrook
- Seabrook Source
- Alligator Point Rookery*
- Dickinson Bayou Oyster*
- Oyster Evia Island*
- Marquette**

* Commercial Source
 ** No Sediment Source



Coastal Texas Protection and Restoration Feasibility Study

Datum: ESRI Modern Antiqua

0 2 1/2 5 Miles

DATUM: NAD 1983
 PROJECTION: STATE PLANE
 ZONE: TX-SC 4204

8 September 2020

Figure 19: Mitigation and Sediment Source Sites

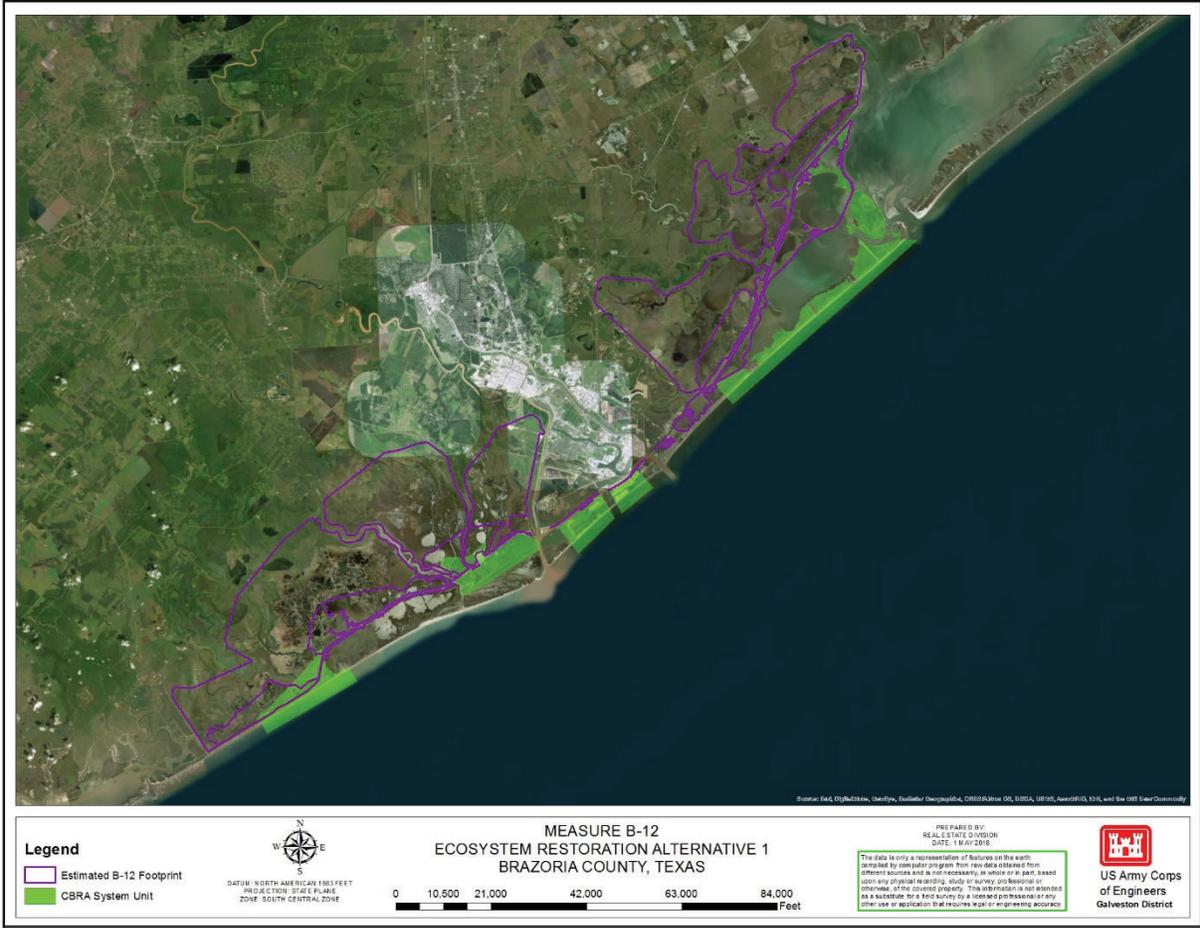


Figure 20: CBRS System Units within ER Measure B-12

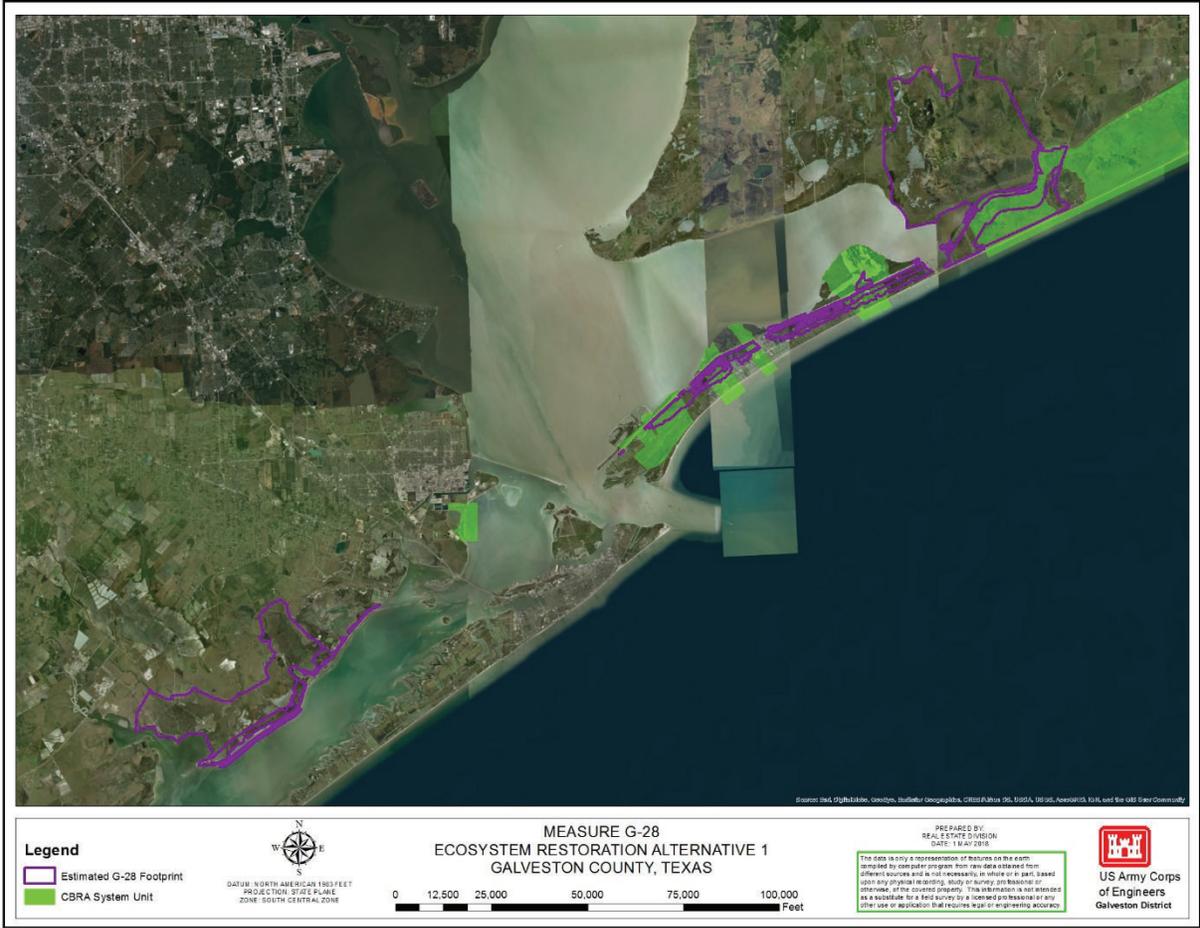


Figure 21: CBRS System Units within ER Measure G-28

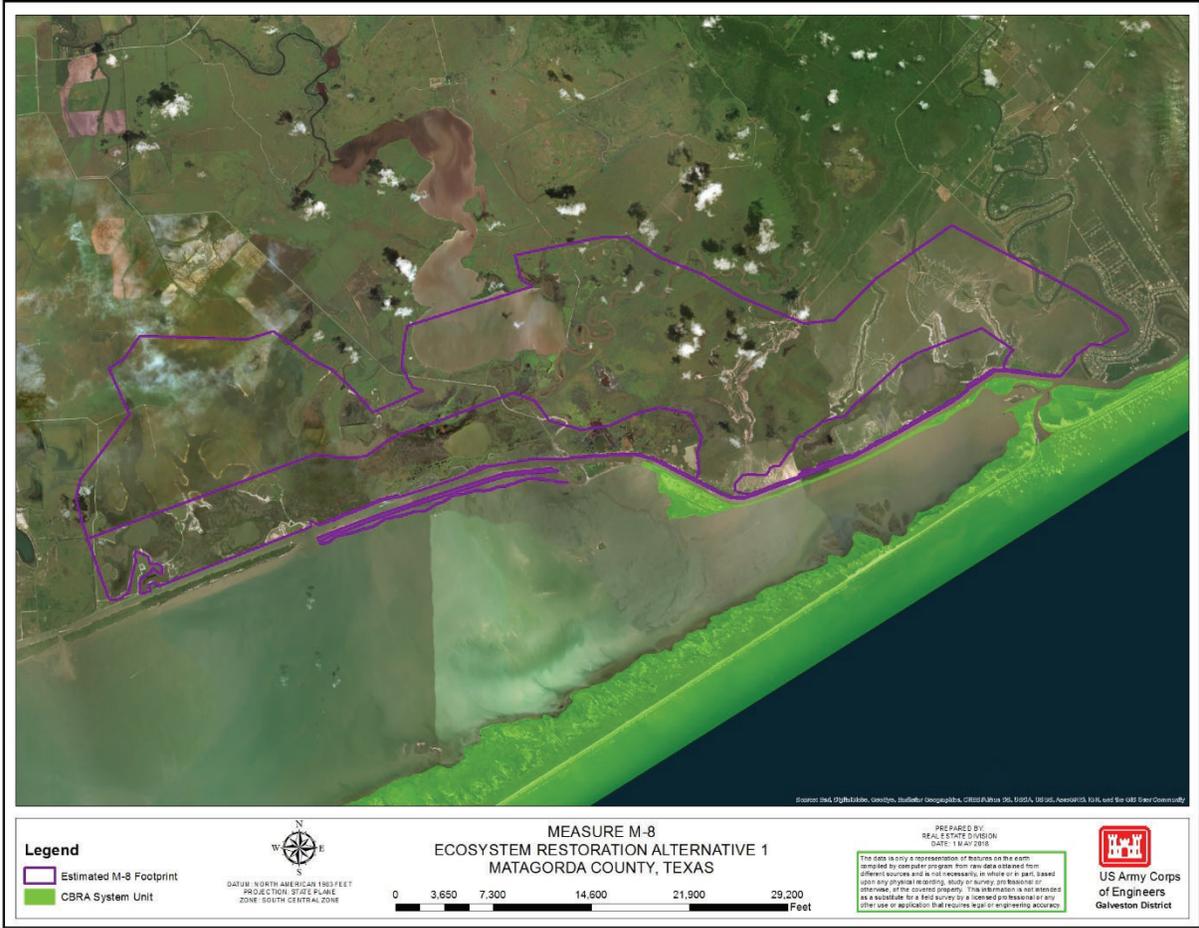


Figure 22: CBRS System Units within ER Measure M-8

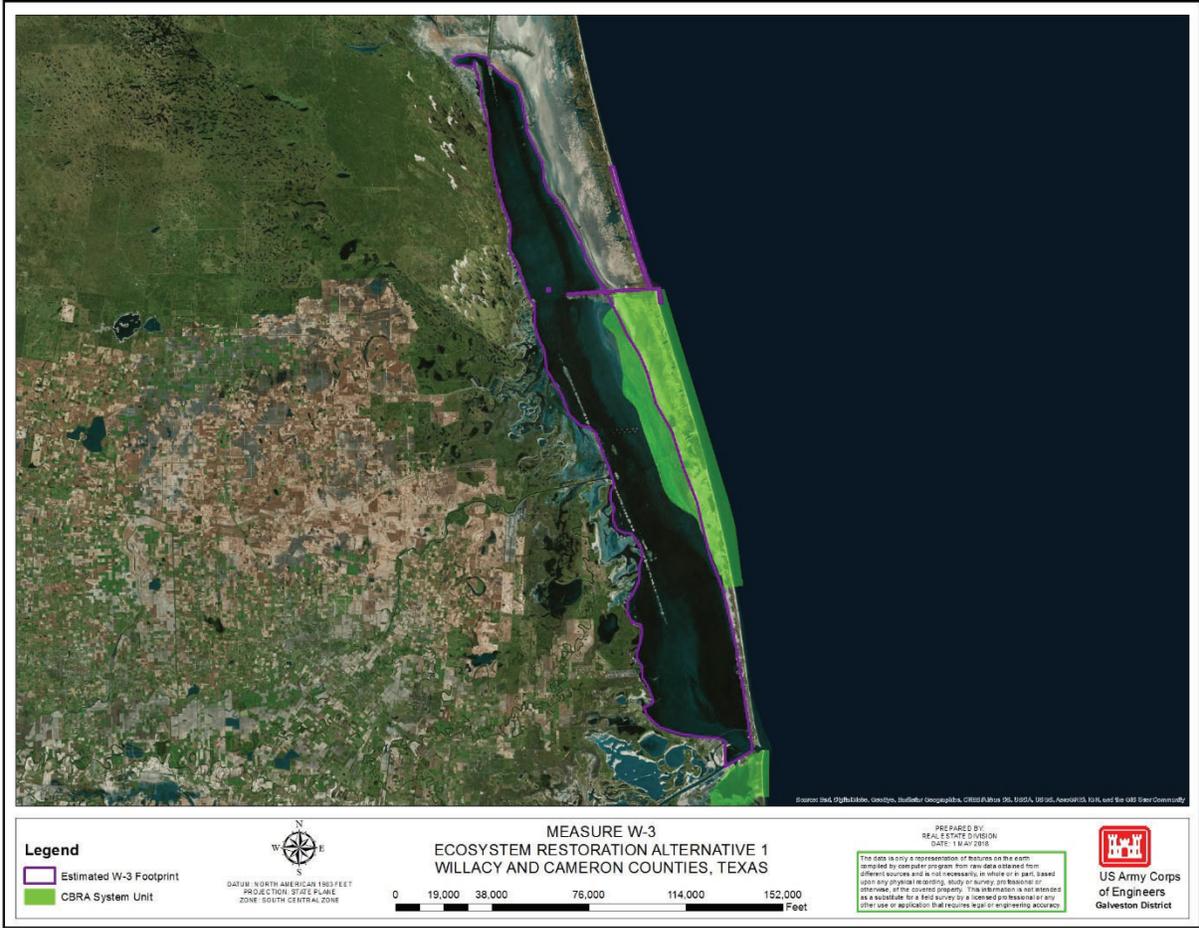


Figure 23: CBRS System Units within ER Measure W-3



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

Real Estate Division

Name
Title
Texas General Land Office (TXGLO)
1700 Congress Ave.
Austin, TX 78701-1495

Dear Sirs/Madam:

It is our understanding that TXGLO is the construction sponsor of the Texas Coastal Project and will have the responsibility to furnish all Lands, Easements, Right of Ways, Relocations, and Disposals LERRDs. The purpose of this letter is to advise the risks to TXGLO if lands are acquired prior to the signing of prior to execution of a Project Partnership Agreement (PPA) with the Federal Government. We appreciate your support for this proposed project, but our regulations require us to inform you that **IF FOR ANY REASON, THE PPA NEVER GETS SIGNED OR IF CONGRESS FAILS TO AUTHORIZE OR FUND THE PROJECT, ANY LAND YOU ACQUIRED OR ANY MONEY YOU SPEND IN YOUR EFFORTS TO ACQUIRE LAND WILL BE AT THE SOLE RISK OF TXGLO.** Furthermore, for any property that qualifies for Federal participation in the project, your acquisition efforts must be in compliance with all of the provisions of P.L. 91-646, the Federal Relocation Assistance Law.

Please ensure that records are kept regarding purchase price and real estate administrative expenses such as title evidence, surveys and appraisal fees. This will be necessary for you to receive credit in the event of Federal Authorization. Please be advised that regulations dictate that credit will not be given for real estate administrative costs for any properties acquired five or more years prior to execution of a PPA.

If you have any questions, please contact Mr. Kenny Pablo at (409) 766-3816 or Kenneth.Pablo@usace.army.mil.

Sincerely,

Timothy J. Nelson
Chief, Real Estate Division
Galveston District
U.S. Army Corps of Engineers

Figure 24: Risk Letter