# Houston Ship Channel Feasibility
# Houston-Galveston Navigation Channels, Texas

## Real Estate Appendix

**21 August 2017**

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## General

This Real Estate Plan (REP) is the real estate work product of the U.S. Army Corps of Engineers, Galveston District, Real Estate Division and supports the Project plan formulation for the Houston Ship Channel Expansion and Channel Improvement Report. It identifies and describes the lands, easements, rights-of-way, relocations (i.e., P.L. 91-646 relocations and utility/facility relocations), borrow material, and dredged or excavated material disposal areas (LERRD), required for the construction, operation and maintenance of the proposed Project. Further, the REP describes the estimated LERRD value, together with the estimated administrative and incidental costs attributable to providing Project LERRD, and the acquisition process. This REP is tentative in nature for planning purposes only and is intended to match the level of detail available in the main feasibility investigation report. Therefore, the final real property lines, estimates of value and rights required for project construction, operation and maintenance are subject to change even after approval of this report.

The study is being performed under the standing authority of Section 216 of the Flood Control Act (FCA) of 1970 Public Law (P.L.) 91-611, as amended:
The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operations of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due [to] significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest.

## Non-Federal Sponsor

The NFS is the Houston Port Authority (HPA). HPA is providing the majority of the environmental analyses and engineering products as Work-In-Kind (WIK) products.

## Purpose

The purpose of this study is to evaluate Federal interest in alternative plans (including the no-action plan) for reducing transportation costs and addressing navigation safety issues on the HSC and assess the effects of the alternatives on the natural system and human environment, including the economic development effects of existing inefficiencies.

Existing inefficiencies include congestion along the waterway. The high volume of barge and deep-draft vessel traffic exacerbates congestion and results in increased delays and possible accidents. For a given volume of traffic, channel deepening and or widening can result in fewer trips and reduce congestion. Additionally, channel deepening and/or widening could alleviate some congestion and safety problems by enhancing the maneuverability and control of deep-draft vessels. Additional turning basins, moorings,

and/or anchorages can also help reduce inefficiencies at HSC by alleviating congestion and reducing total vessel transit times. Safety issues on the HSC have already been established under the Houston Ship Channel Project Deficiency Report (Flare at the Intersection of the Houston Ship Channel and Bayport Ship Channel), Houston-Galveston Navigation Channels, Texas – Galveston District, March 2016 (HSCPDR). The HSCPDR, approved May 9, 2016, recommended an interim corrective action through a channel modification to make the project function in a safe, viable, and reliable manner. The ultimate fix was to be included in this study.

The need for this study arises from inefficiencies currently experienced by commercial vessels navigating the HSC system. In general, the entire HSC will be evaluated for up to date current and projected vessel size and traffic. The HSC, Galveston Harbor and Channels, Galveston Entrance Channel, and the Texas City Ship Channel are integrally connected to the overall navigation system of the Galveston Bay area. However, this feasibility study will focus entirely on the HSC.

Beginning at the most seaward end of the HSC, terminating at Bolivar Roads at the Galveston Entrance Channel, the study will examine possible anchorage, and meeting and passing lanes in the Bay Reach, as well as study the side channels, Bayport Ship Channel (BSC) and Barbours Cut Channel (BCC). Additionally, the study will look at the upper reach of the HSC between Boggy Bayou and the Main Turning Basin. Beneficial Use (BU) of dredged material and/or upland confined placement areas (PAs) will also be considered under this feasibility study. See **Exhibit "A"** for an overview of the study segments or reaches in the study scope. The Galveston Entrance Channel, Galveston Channel, Texas City Ship Channel, and Cedar Bayou Channel dimensions are provided; however, these channels are not within the scope of the study.

## Project Authority

| Date Authorizing Act | Project and Work Authorized for HSC | Documents |
|---|---|---|
| Houston Ship Channel, Texas, Project Authorizations: | | |
| Mar 5, 1905 | Easing or cutting off sharp bends and construction of pile dike[1] | Rivers & Harbors Committee Document 35, 61st Congress, 2nd Session |
| Mar 2, 1919 | A channel 30 feet deep, widen bend at Manchester and enlarge turning basin | House Document 1632, 65th Congress, 3rd Session |

| | | |
|---|---|---|
| Mar 3, 1925 | A light-draft extension of channel to mouth of White Oak Bayou[2] | House Document 93, 67th Congress, 1st Session |
| Jul 3, 1930 | Widen channel through Morgan Point and to a point 4,000 feet above Baytown and widen certain bends. | House Document 13, 71st Congress, 1st Session |
| Aug 30, 1935[3] | Deepen to 32 feet in main channel and turning basin, and a 400-foot width through Galveston Bay. | Rivers & Harbors Committee Document 28, 72nd Congress, 1st Session |
| Aug 30, 1935 | Deepen to 34 feet in main channel and widen from Morgan Point to turning basin | Rivers & Harbors Committee Document 58, 74th Congress, 1st Session |
| Mar 2, 1945 | Branch channel 10 by 60 feet behind Brady Island. | House Document 226, 76th Congress, 1st Session |
| Mar 2, 1945 | Widen channel from Morgan Point to lower end of Fidelity Island with turning points at mouth of Hunting Bayou and lower end of Brady Island. | House Document 226, 76th Congress, 1st Session |
| Mar 2, 1945 | Widen channel from lower end of Fidelity Island to Houston turning basin and dredge off-channel silting basins. | House Document 737, 79th Congress, 2nd Session |
| Jun 30, 1948 | Deepen to 36 feet from Bolivar Roads to and including main turning basin at Houston, Texas, including turning points at Hunting Bayou and Brady Island. | House Document 561, 80th Congress, 2nd Session |
| Jul 3, 1958[4] | Deepen to 40 feet from Bolivar Roads to Brady Island, construct Clinton Island turning basin, a channel 8 by 125 feet at Five Mile Cut, and improve shallow draft channel at Turkey Bend. | House Document 350, 85th Congress, 2nd Session |
| Jul 14, 1960 | Barbour Terminal at Morgan Point | Section 107, PL 86-645 |
| Oct 27, 1965 | Restoring existing locally dredged channel from Mile 0 to 0.34 to 36 feet deep and dredging a 15-12 foot channel from Mile 0.34 to 2.81 in Greens Bayou.[5] | House Document 257, 89th Congress, 1st Session |
| Nov 17, 1986 | Maintenance of Greens Bayou, Barbour Terminal Channel, and Bayport Ship Channel to forty-foot depths at Federal Expense. | Section 819, PL 99-662 |

[1]*Construction of pile dike was deauthorized under Section 12 of PL 93-251 (1975 Deauthorization List).*

[2]*Hill Street Bridge to mouth of White Oak Bayou was deauthorized under Section 12 of PL 93-251 (1975 Deauthorization List).*

[3]*Previously authorized Sep 6, 1933 by Public Works Administration.*

[4]*Deepening channel to 40 feet from Southern Pacific Slip (mile 47) to Brady Island deauthorized under Section 12 of PL 93-251 (1985 Deauthorization List).*

[4]*Contains latest published maps.*

[5]*The 12-foot channel from mile 1.65 to mile 2.81 deauthorized under Section 12 of PL 93-251 (1975 Deauthorization List).*

## Study Area

The HSC provides access to various private and public docks and berthing areas associated with the Port of Houston. It is the longest major navigation channel of a larger system of navigation channels of the Galveston Bay Area and spans Harris, Chambers, and Galveston Counties, Texas. The HSC project consists of an existing 50-mile long deep-draft navigation channel, four deep-draft tributary channels and one shallow draft tributary channel. Several other minor tributary channels also intersect the HSC, including South Boaters Cut, North Boaters Cut, and Five Mile Cut.

Although the Texas City Channel, Galveston Harbor and Channel, and the Cedar Bayou Channel Projects are located in the same bay system, they are not part of the HSC ECIP Feasibility Study. The Galveston Entrance Channel provides access from the Gulf of Mexico to the HSC and Galveston Harbor. Just beyond Galveston Harbor, the HSC and the Texas City Ship Channel intersect at Bolivar Roads. Additionally, on the northern end of the Atkinson Island Marsh, the HSC intersects with the Cedar Bayou (shallow draft) Federal channel. These channels are integrally connected to the overall navigation system of the Galveston Bay area; however, each has their own independent sponsor.

Beginning at the seaward end of the project, the HSC begins at Bolivar Roads at mile 0, extending north through the Galveston Bay, the San Jacinto River, and Buffalo Bayou to the Main Turning Basin at Houston, Texas. From there an approximately 6-mile long shallow draft channel, referred to as the (Buffalo Bayou) Light Draft Channel, extends upstream of the Main Turning Basin and continues past the Main Turning Basin (mile 50.2). **Exhibit "B"** depicts the channels and existing placement areas for the HSC system.

The authorized channel dimensions within the HSC vary. The original authorization for the 45' channel was in Mean Low Tide (MLT). The Galveston District recently converted the HSC to the Mean Lower Low Water (MLLW) datum.

From Bolivar Roads (mile 0) to Boggy Bayou (mile 40) the channel depth is 46'/46.5' MLLW (45' MLT) feet and width is 530 feet. Between Boggy Bayou and Sims Bayou (mile 47), the channel depth is 41.5' MLLW (40' MLT) feet and width is 300 feet. From Sims Bayou to the Main Turning Basin (mile 52), the channel depth is 37.5' MLLW (36' MLT) feet and width is 300 feet. Additionally, barge lanes are immediately adjacent to and on either side of the HSC from Bolivar Roads to Morgans Point (mile 26), a distance of approximately 26 miles. Each barge lane measures approximately 125' feet wide with a depth of 13' MLLW (12' MLT) feet. Dredged material is typically deposited in a variety of upland confined placement area (PA) sites and BU sites, but some material from the lower bay region has been placed offshore in the Ocean Dredged Material Disposal Site (ODMDS) historically referred to as PA 1.

The HSC system also includes side or tributary channels known as BSC, BCC, Jacinto Port Channel, and Greens Bayou Channel. See Table 2 for a summary of the channel dimensions for the HSC, its tributary channels, and Turning Basins.

Beginning at the seaward end of the project area existing channel feature will be briefly discussed.

Galveston Harbor and Channels consists of the Galveston Entrance Channel and Galveston Harbor Channel. Though not in the scope of the study, the interconnectivity to the HSC requires description here. The total length of these channels is 18.7 miles. The Entrance Channel is 14.4 miles with a depth of 48' MLLW (47' MLT) feet and width of 800 feet, but decreases to 46' MLLW (45' MLT) feet in depth near Bolivar Roads (mile 0). The Galveston Harbor Channel is 4.3 miles with a depth of 46' MLLW (45' MLT) feet and varying widths from 800 – 1,133 feet. The 46' MLLW (45' MLT) foot depth ends around Pier 38; however, the last 2,571 feet of the west end of the channel remains at a depth of 46' MLLW (40' MLT) feet. The Galveston Harbor Channel Extension Feasibility Study currently in progress is evaluating deepening the last 2,571-feet of channel to match the adjacent 46' MLLW (45' MLT) foot channel. Dredged material placement for the Galveston Harbor and Channels is placed in the ODMDS (PA 1) in the Gulf of Mexico and/or Pelican Island and San Jacinto upland confined PAs. The Galveston Harbor and Channels are not in the scope of this study.

Texas City Ship Channel is a 6.5-mile channel that is 46' MLLW (45' MLT) feet deep and 400 feet wide. The channel includes an Industrial Canal that is 41' MLLW (40' MLT) feet deep and varies between 300-400 feet in width; the Industrial Canal extends for a distance of 1.9 miles southwest of the south end of Texas City Turning Basin. Construction of the locally preferred

plan to deepen the channel to 46' MLLW (45' MLT) feet was completed in 2011. Dredged material from the channel is placed in both upland confined PA and BU sites. The Texas City Ship Channel is not in the scope of this study.

Barge Lanes measuring 125 feet wide by 13' MLLW (12' MLT) feet deep are located immediately adjacent to and on either side of the HSC and extend from Bolivar Roads to Morgan's Point, a distance of approximately 26 miles. The barge lanes were constructed due to heightened concerns of the interaction between faster moving large vessels with slower moving barge tows.

South Boaters Cut – This 10,000-foot long cut intersects the HSC between Redfish Reef and Mid Bay PA. The 300 feet wide by 9' MLLW (8' MLT) feet deep cut was constructed to allow smaller vessels to move off the HSC and into the bay.

North Boaters Cut – This 11,000-foot long cut intersects the HSC between Mid Bay PA and PA 14. The 100 feet wide by 9' MLLW (8' MLT) feet deep cut was constructed to allow smaller vessels to move off the HSC and into the bay.

Five Mile Cut – This 125 feet wide by 9' MLLW (8' MLT) feet deep shallow draft channel connects to the HSC just south of the BSC and runs eastward 10,000 feet.

Bayport Ship Channel (BSC) is a deep-draft tributary of the HSC that connects to the HSC and runs westward toward the west shoreline of Galveston Bay between La Port, Texas and Seabrook, Texas. This channel extends west from the main HSC approximately 4.1 miles to the Bayport Terminal. The federally authorized channel depth is 41.5' MLLW (40' MLT) feet, with a width of 300 feet. The PHA recently obtained Section 408 approval and a Department of the Army Permit pursuant to Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (CWA)(33 U.S.C. 1344) ("Section 10/404 permit") to deepen the channel to 46.5' MLLW (45' MLT) feet, widen the bay portion of the channel by 100 feet, and widen the constricted portion of the channel within the land cut by 50 feet. Expected completion of the aforementioned work is in the first quarter of fiscal year (FY) 2017, with subsequent Federal assumption of maintenance (AOM) under Section 204(f). The BSC serves the Bayport Container and Cruise Terminals and two liquid bulk terminals at Odfjell and Liquid Bulk Chemicals (LBC). The Bayport Flare is located at the intersection of the BSC and the HSC. A Project Deficiency Report outlining a proposed corrective action to correct a design deficiency to provide interim relief for navigational safety concerns at the flare and the bend in the HSC near BSC was approved in March 2016.

Barbers Cut Channel (BCC) in located just north of Morgan's Point and extends to the west from the main HSC approximately 1.6 miles to the Barbours Turning Basin. The BCC is approximately

300 feet wide with an authorized depth of 41.5' MLLW (40' MLT) feet. The PHA recently obtained Section 408 approval and a Section 10/404 permit to deepen the channel to 46.5' MLLW (45' MLT) feet and shift a portion of the channel to the north to provide sufficient berthing space for adjacent private facilities. Construction of these improvements was completed in August 2015, with subsequent Federal AOM under Section 204(f). The BCC serves the Barbours Cut Container Terminal.

Jacintoport Channel connects to the HSC approximately 10 miles upstream of BCC and east of Boggy Bayou. Currently, the Jacintoport Channel is not a Federal Channel; however, under Section 5001 of WRDA 2007, maintenance has been federally assumed as of 29 April 2016.

Greens Bayou Channel intersects with the HSC approximately 4 miles upstream of Boggy Bayou. The Greens Bayou Channel is a 2.1 mile long combination 41.5' MLLW (40' MLT) feet deep draft and 16.5' MLLW (15' MLT) feet shallow draft tributary.

Table 1 below identifies the owner/ easement provided to the Government and status of each PA. Each of these PAs will be discussed in turn. A map of the Houston Ship Channel and placement areas is shown on **Exhibit B**.

**Table1: Real Estate Status of Existing HSC PAs and BU sites**

| PA | Owner(s) / Easement to Government | Status |
|---|---|---|
| ODMDS 1 | State of Texas / Navigation Servitude | Active |
| Bolivar Marsh BU | State of Texas / Navigation Servitude | Active |
| Evia Island BU | State of Texas / Navigation Servitude | Inactive |
| Mid Bay PA | State of Texas / Navigation Servitude | Active |
| PA 14 PA | PHA / Navigation Servitude ** | Active |
| PA 15 PA | PHA / Navigation Servitude ** | Active |
| PA 14/15 Connection | State of Texas / Navigation Servitude ** | Active |
| Atkinson Island Marsh BU | PHA / Navigation Servitude ** | Active |
| PA 16 | PHA / Navigation Servitude ** | Active |
| Spilman Island PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| Alexander Island PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| Peggy Lake PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| Goat Island BU | PHA / Navigation Servitude | Inactive |
| Lost Lake PA | PHA / Perpetual Dredge Material Placement Easement | Active |
| Rosa Allen PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| East Clinton PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| West Clinton PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| House Tract PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| Glendale PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |
| Filterbed PA | PHA / 50-Yr Dredge Material Placement Easement* | Active |

***The 50 easement conveyed from PHA to the Government exceeds the 20- year term identified in this report. ** Perpetual Easement from Chambers-Liberty Counties Navigation District.***

**Bolivar Roads to Redfish Reef Study Reach**

**Ocean Dredged Material Disposal Site (ODMDS) 1** - This ODMDS site, also referred to as PA 1, is an open water dispersive site located approximately 3.7 nautical miles offshore from Galveston Island and covers an area of about 5,550 acres. For dispersive sites, the material may not remain within the boundaries of the ODMDS after placement. A Particle Tracking Model (PTM) was done for this site and showed that material placed in the ODMDS does not return to the channel. This site was coordinated for the Galveston Harbor and Channel, Texas project with the Site Monitoring and Management Plan (SMMP) for the ODMDS#1 being signed in 2008 by the EPA and USACE, Galveston. This site is currently used for placement of material from the Bolivar Roads to Redfish Reef dredging reach. Each use of the ODMDS requires sediment testing and coordination with and approval by the EPA.

The District is in the process of re-coordinating the ODMDS 1 site with the EPA to allow for the regular placement of maintenance material into ODMDS 1 from the Bolivar Roads to Redfish Reef Study Reach and possible placement of maintenance material from additional reaches of the HSC further upstream. Therefore, use of ODMDS 1 for future placement of maintenance dredged material from the HSC is considered feasible (contingent upon approval by the EPA) and as such, this study reach has sufficient 20-year capacity for maintenance dredged material.

**Bolivar Marsh BU** – Bolivar Marsh is a BU site associated with the HGNC 45-foot widening and deepening project. The marsh is located about 2.5 miles east of the HSC along the bay side of Bolivar Peninsula. The Bolivar Marsh site totals approximately 990 acres of BU and an additional 88 acres of mitigation marsh for the PA 14/15 Connection. The marsh cells with the exception of Cell 2 were filled with dredged material during construction of the HGNC project. Cell 2 was not filled so that adequate water circulation would occur through Cells 1 and 3. This site is not considered for future placement of maintenance material from the HSC because construction of the marsh is complete. Additionally, it is too far from the HSC to be considered economical for maintenance dredging. The Gulf Intracoastal Waterway (GIWW), Texas Project has designated PAs located adjacent to the Bolivar Marsh BU site. These GIWW PAs restrict further expansion of the Bolivar Marsh BU site because the expansion would interfere with use of those PAs for GIWW maintenance. Any new sites by the GIWW would be potentially adjacent to PHA upland property.

**Evia Island BU** – Evia Island is a 6-acre emergent man-made bird island with beach on one side, located approximately one mile north of Bolivar Marsh. The island was constructed with dredged material during construction of the HGNC 45-foot project and armored with rock in an FY 98 construction contract. A breakwater was constructed to protect the beach. The site is a very productive avian nesting island. PHA contracts with the Houston Audubon Society (most recently renewed December 2014, for four more

years) to manage Evia Island. The site is considered constructed, as its current size is considered to be most effective as a bird sanctuary. Increasing the island increases the potential for predators to establish on the island and harm the successful bird colonies. Construction was complete prior to 2001. PHA took over management through the Audubon Society in June 2001. This site is not considered feasible for future placement of dredged material.

**Redfish Reef to Morgan's Point (including Bayport) Study Reach**

**Mid Bay PA** – This approximately 600-acre site is an emergent bay confined PA located to the east of the HSC and south of Atkinson Island in Galveston Bay. Estimated ultimate capacity of this PA is 29.3 million cubic yards (MCY) as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of elevation (EL) +35 feet (NAVD88). This site is considered feasible for future placement of dredged maintenance material.

**PA 14** – This approximately 325-acre site is an upland confined PA located east of the HSC on the southern end of Atkinson Island in upper Galveston Bay. Situated on the opposite side of the channel from the Bayport Channel, PA 14 was once semi-confined with material allowed to exit on the bay (east) side of the site. PA 14 is owned by the State of Texas and CLCND and patented to the NFS. This PA was constructed under navigation servitude, eventually becoming fully confined under the HGNC Project. That said, the NFS will not be eligible for LERRD credits for PA 14. Estimated ultimate capacity of this PA is 16.6 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +50 feet (NAVD88). This site is considered feasible for future placement of dredged maintenance material.

**PA 15** – This approximately 395-acre site is a confined upland PA located east of the HSC and on Atkinson Island north of PA 14 in Galveston Bay. PA 15 was once semi-confined with material allowed to exit on the bay (east) side of the site. This PA became fully confined under the HGNC Project. PA 15 is owned by the State of Texas and CLCND and patented to the NFS. This PA was constructed under navigation servitude, eventually becoming fully confined under the Houston HGNC Project. That said, the NFS will not be eligible for LERRD credits for PA 15. Estimated ultimate capacity of this PA is 22.6 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +50 feet (NAVD88). This site is considered feasible for future placement of dredged maintenance material.

**PA 14/15 Connection** – This approximately 160-acre site is planned as a confined upland PA that will connect the currently-separate PA 14 and PA 15 placement areas. Rock dikes have been constructed on the channel and bay sides to define the site. The channel-side dike currently has a breach to allow access to an oil/gas structure within the site. Construction of the rock dikes was funded with American Recovery and Reinvestment Act of 2009 (ARRA) funds. The site is not currently available due to the location of

oil and gas structure. Once the five year Real Estate license ends the oil/gas structure within the site is to be removed. The site will be available for use as a placement area at that time and construction will be completed. Estimated ultimate capacity of this PA is 10.3 MCY once construction of the site is complete. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +50 feet (NAVD88). This site is considered feasible for future placement of dredged maintenance material. PA 14-15 Connection is owned by the State of Texas and CLCND and patented to the NFS. This PA is currently semi-confined and is being constructed under navigation servitude, eventually becoming fully confined under the HGNC Project. That said, the NFS will not be eligible for LERRD credits for PA 14/15 Connection.

**PA 16** – This approximately 80-acre site is a confined upland PA located east of the HSC and on Atkinson Island north of PA 15 in Galveston Bay. Dike elevation is limited by poor soil conditions and there is severe shoreline erosion on the channel-side levee. Due to the erosion and not having a survey done the capacity of PA 16 is unknown. This PA is too small for the maintenance dredging contracts normally performed on the HSC; therefore, is not routinely used. It may be used in the future for maintenance dredging; however, is not included in the planned DMMP developed in this study.

**Atkinson Island BU Marsh Site** – The Atkinson Island Marsh is located on the east side of Atkinson Island. The marsh is comprised of cells designated NW, M1/2, M3, M4, M5/6, M7/8/9, and M10 constructed on the bay bottom and attached to the east side of Atkinson Island. Containment dikes for the initial four marsh cells were constructed using new work material from the HGNC 45-foot project. Cell NW was filled using new work from the HGNC 45-foot project. Cells M1/2, M3, and M4 were filled using maintenance material from the HSC and Bayport Ship Channel. The Cell M5/M6 containment dike was constructed using new work obtained from mining of the Barbours Cut Channel. Cell M5/M6 has been partially filled using maintenance material from Bayport Ship Channel. The containment dikes for Cell M7/8/9 and Cell M10 were constructed hydraulically using new work resulting from mining of the HSC. Repairs to the containment dikes at Cells M7/8/9 and M10 dikes are required before any maintenance material can be used for marsh filling. Filling and planting of Cell M10 is scheduled for completion in FY 26. Upon completion the marsh will total approximately 1,842 acres. Placement of material into Atkinson Island Marsh cells are considered feasible for future placement of dredged maintenance material.

**Morgan's Point to Exxon (including Barbours) Study Reach**

**Spilmans Island PA** – This approximately 890-acre site is a confined upland PA located to the west of the HSC and northwest of Morgan's Point, Texas. Estimated ultimate capacity of this PA is 24.5 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +45 feet (NAVD88). This site is considered feasible for future placement of dredged material. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in April 2000. The DMMP Report TSP requires the

NFS assure the availability of and capacity in Spilman Island PA for the next 20 years. The NFS shall convey to the Government a Non-Standard Disposal Easement for Spilman Island PA.

**Alexander Island PA** – This approximately 650-acre site is a confined upland PA located west of the HSC and northwest of Morgan's Point, Texas. Estimated ultimate capacity of this PA is 27.6 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +45 feet (NAVD88). This site is considered feasible for future placement of dredged material. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in April 2000. The DMMP Report TSP requires the NFS assure the availability of and capacity in Alexander Island PA for the next 20 years. The NFS shall convey to the Government a Non-Standard Disposal Easement for Alexander Island PA.

**Exxon to Greens Bayou (not including Greens Bayou) Study Reach**

**Peggy Lake PA** – This approximately 240-acre site is a confined upland PA located to the west of the HSC near Deer Park and La Porte, Texas. Estimated ultimate capacity of this PA is 7.4 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +35 feet (NAVD88). This site is considered feasible for future placement of dredged material. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in April 2008. The DMMP Report TSP requires the NFS assure the availability of and capacity in Peggy Lake PA for the next 20 years. The NFS shall convey to the Government a Non-Standard Disposal Easement for Peggy Lake PA.

**Goat Island General Navigation Feature BU** – This is a BU site located to the east of the HSC, across from Peggy Lake PA and the San Jacinto Battleground State Historic Site. The existing Goat Island had all but disappeared due to subsidence and erosion. This 320-acre restoration site was completed around 2002 and therefore, use of this site for future placement of dredged material from the HSC is no longer considered feasible.

**Lost Lake PA** – This approximately 600-acre site is a confined upland PA located to the north of the HSC at the confluence of the San Jacinto River and Buffalo Bayou. Estimated ultimate capacity of this PA is 16.0 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +38.6 feet (NAVD88). This site is considered feasible for future placement of dredged material. A Perpetual Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in April 2000.

**Upstream of Greens Bayou (including Greens Bayou, Turning Basin, and Light Draft Channel) Study Reach**

**Rosa Allen PA** – This approximately 223-acre confined upland PA is located in Houston, Texas about one mile south of the HSC near the Clinton Island Turning Basin in the Greens Bayou to Sims Bayou Dredging Reach. Estimated ultimate capacity of this PA is 4.0 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +55 feet (NAVD88). This site is considered feasible for future placement of dredged material. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in November 2001. The DMMP Report TSP requires the NFS assure the availability of and capacity in Rosa Allen PA for the next 20 years. The NFS shall convey to the Government a Non-Standard Disposal Easement for Rosa Allen PA.

**Clinton PA** – This approximately 607-acre site is a confined upland PA located in Galena Park, Texas about one-and-a-half miles north of the HSC in the Sims Bayou to Main Turning Basin Dredging Reach. This site is divided in to two cells known as West Clinton (317 acre) and East Clinton (290 acre). Estimated ultimate capacity of this PA is 16.4 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate height of EL +60 feet (NAVD88). This site is considered feasible for future placement of dredged material. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in November 2001. The DMMP Report TSP requires the NFS assure the availability of and capacity in Clinton PA for the next 20 years. The NFS shall convey to the Government a Non-Standard Disposal Easement for Rosa Allen PA. The NFS shall provide to the Government, for its review and approval, a title policy demonstrating the NFS's title to Rosa Allen PA, as well as a third party mineral title search if the sub-surface rights have been severed.

**House Tract PA** This approximately 312-acre confined upland PA is located in Houston, Texas about one-and-a-half miles north of the HSC in the Sims Bayou to Main Turning Basin Dredging Reach. Estimated ultimate capacity of this PA is 7.4 MCY as of the beginning of this 20-year DMMP. The estimated capacity assumes the containment dike can be raised to an ultimate average height of EL +66 feet (NAVD88). This site is considered feasible for future placement of dredged material. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in November 2001. The DMMP Report TSP requires the NFS assure the availability of and capacity in House Tract PA for the next 20 years. The NFS shall convey to the Government a non-revocable, Non-Standard Perpetual Disposal Easement for House Tract PA. The NFS shall provide to the Government, for its review and approval, a title policy demonstrating the NFS's title to House Tract PA, as well as a third party mineral title search if the sub-surface rights have been severed.

**Glendale PA** – This approximately 177-acre confined upland PA is located in Houston, Texas about one-half mile northeast of the HSC in the Sims Bayou to Main Turning Basin Dredging Reach. This site hasn't been used in over 20 years. The site is available, but would require significant dike work, new drop outlet structures, a dredge pipeline easement, and perhaps an effluent ditch. A rough estimate of the ultimate remaining capacity of this PA, if redeveloped, is 3.6 MCY. Residential neighborhoods border the north and a portion of the west side. Industrial development borders the full length of the east side. Significant public relations work will be required prior to construction and use due to past dike breaches. This site is considered feasible for future placement of dredged material; however, is not planned for use in this DMMP. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in November 2001. The DMMP Report TSP requires the NFS assure the availability of and capacity in Glendale PA for the next 20 years. The NFS shall convey to the Government a Non-Standard Disposal Easement for Glendale PA.

**Filterbed PA** – This approximately 90-acre confined upland PA is located about one-quarter mile north of the HSC at the north end of the deep-draft portion of the HSC. This site hasn't been used in over 20 years. The site is available, but would require significant dike work, new drop outlet structures, a dredge pipeline easement, and perhaps an effluent ditch. A rough estimate of the ultimate remaining capacity of this PA, if redeveloped, is 0.6 MCY. Residential neighborhoods border the east side, with industrial development on the north and west sides. PHA has reported levee slope failures at Filterbed; as such, public relations work will be required prior to construction in addition to conducting repairs. This site is considered feasible for future placement of dredged material; however, is not planned for use in this DMMP. A Fifty-Year Dredged Material Placement Easement was conveyed from the Port of Houston Authority to the Government in November 2001. The DMMP Report TSP requires the NFS assure the availability of and capacity in Filterbed PA for the next 20 years. The NFS shall convey to the Government a Non-Standard Disposal Easement for Filterbed PA.

For those open water PAs developed on submerged land subject to patent from TXGLO, NFS shall coordinate with TXGLO and identify any mineral interests that may be severed.

## Project Area

The study will focus on the entire 50 miles of the HSC, in particular, the upper reach from Boggy Bayou to the Main Turning Basin, as well as the side channels, (BSC and BCC) and Galveston Bay. The upper reach of the channel is located within a highly developed industrialized urban area of Houston where few tracts of vacant undeveloped land remain. Any new PAs that may be required by the proposed action will result in potential impacts including residential, business, pipeline, roadway, and railroad relocations. The portions of the study (BSC, BCC, possible anchorage in bay, and placement options) within the bay reach of the HSC will likely involve benthic and oyster impacts and pipeline(s) may need to be relocated.

## Real Estate Requirements

The Non-Federal Sponsor is responsible for acquiring and furnishing all lands, easements, rights-of-way, relocations (i.e., P.L. 91-646 relocations and utility/facility relocations), borrow material, and dredged or excavated material disposal areas (LERRD) for the project, if required. The real estate requirements for the Project must support construction as well as the continued operation and maintenance of the Project. The majority of the proposed work will be constructed over open water and exercised under navigational servitude. 50 TXGLO submerged tracts were identified as being utilized under navigational servitude. These tracts are located in the CW1 BR-BCC measure. A table of these tracts are shown in **Exhibit "C".** 45 Tracts were identified as NFS owned land via patent by the State of Texas. A table of these tracts are shown in **Exhibit "D".** These submerged lands are located at the BSC and BCC through the upper bayou of this project.

The TSP has been identified as Alternative 8. Alternative 8 (with bay widening ranging from 650-820 feet) is a system-wide plan that best meets the study objectives and when compared to the other alternatives most effectively reduces (and in cases could eliminate) Pilot Rule restrictions guiding navigation in the channel. The components of the TSP will be discussed in turn and shown in draft **Exhibit "E".**

- Four bend easings on main HSC channel with associated relocation of barge lanes (**Segment 1**);
- Widening (in whole or in part) the HSC main channel between Bolivar Roads and BCC from the existing 530-foot width to somewhere between 650-feet to 820 feet (**Segment 1**);
- Addition of a new multipurpose mooring on the HSC near the San Jacinto State Park (**Segment 1**)
- *Minor widening of the channel in the bayou portion of the HSC main channel in the Hog Island stretch (**Segment 1)** ,
- *The alleviation of a channel restriction in Segment 4 by widening from the existing 400-feet to 530-feet for a distance of approximately 1.3 miles from just west of the San Jacinto Monument and Boggy Bayou (**Segment 1)**;
- Flare expansion on BSC (**Segment 2**);
- Shoaling attenuation structure near the BSC Flare (**Segment 2**);
- *A turning basin requested by the pilots to provide for additional turning opportunities at the BSC in Segment 2 at the mouth of the BSC land-cut (**Segment 2**);
- Widen BSC from existing 300-400 feet to 455 feet (**Segment 2**);
- Widen BCC from existing 300 feet to 455 feet (**Segment 3**);
- Combination flare and turning basin on BCC (**Segment 3**);
- Deepen the HSC main channel from Boggy Bayou to Sims Bayou from the existing 41.5-foot depth up to 46.5 feet (**Segment 4**);
- Widen the HSC main channel from Boggy Bayou to Greens Bayou from the existing 400-foot wide channel up to 530 feet (**Segment 4**);
- *Turning Basin at Station 775+00 would be the most upstream location for Aframax vessels to turn (**Segment 4)**;

- *Hunting Turning Basin to ensure continued Federal maintenance (**Segment 4)**;
- Deepen the HSC main channel from Sims Bayou to I-610 Bridge from the existing 37.5-foot depth up to 41.5 feet (**Segment 5**);
- Deepen the HSC main channel from I-610 Bridge to Main Turning Basin from the existing 37.5-foot depth up to 41.5 feet deep (**Segment 6**);
- *Improvement of and consideration of federalizing an existing turning basin located near Brady's Landing in Segment 6 (**Segment 6)**;

Recommended for Federalization

Concurrent with the development of the TSP, project specific 33 U.S.C Section 408 Reports and EAs for the BSC, BCC, Greens Bayou Channel, and Jacintoport Channel were reviewed for the purpose of verifying the non-Federal improvements and making a determination of whether it is in the Federal interest to include the dimensions as part of this recommendation for federal authorization. Note, as part of this feasibility study, the improvements of these AOMs were assumed to be in place in the FWOP condition. Federalization of these improvements would be to the dimensions shown below. For the BSC and BCC, the additional modifications recommended under the TSP are noted in the second bullets.

Bayport Ship Channel (**Segment 2**)

- The non-Federal sponsor improvements resulted in a channel 46.5-feet deep by 400-feet wide from the HSC to the Land Cut and 350-feet wide from the Land Cut to Turning Basin; and
- The TSP recommends further modification to widen the entire BSC 46.5-feet deep channel from 400 feet wide to 455- feet wide.

Barbours Cut Channel (**Segment 3**)

- The non-Federal sponsor improvements resulted in a channel 46.5-feet deep by 300-feet wide; and
- The TSP recommends further modification to widen the BCC 46.5-feet deep channel from 300 feet wide to 455- feet wide.

Greens Bayou Channel is 1.6-mile long combination deep (41.5 feet) and shallow draft (16.5 feet) that serves multiple facilities adjacent to the HSC. This study includes Greens Bayou Channel and confirms the economic benefits of maintaining this channel at the aforementioned depths (**Segment 4)**.

Jacintoport: This study also recommends federalization of the Jacintoport channel (a side channel of the Houston-Galveston Navigation Channels, Texas Federal navigation project) to a depth of 41.5 feet. The analysis completed under Section 5001 of WRDA 2007 confirmed the Federal interest of this channel (**Segment 1)**.

There will be portions of work that will need staging areas however, at the time this REP was drafted access/ staging areas were yet to be determined. Also, no lands have been identified as being needing to be acquired. This report will be updated if lands are identified as needing to be acquired during the DMMP phase.

In the event that lands will be needed for upland placement of dredged material and/or shoreline lands for channel improvement, the easements below may be needed.

**Non Standard Dredged Material Placement Easement**
A assignable right and easement on, over, and across (the land described in Schedule A) (Tracts Nos. _____,_____, and _____), for the location, construction, operation, maintenance and patrol of a dredged material disposal facility, including the right to borrow and/or deposit fill, spoil and dredged material thereon, the right to move, store and remove equipment and supplies, and the right to perform any other work necessary and incident to said facility, together with the right to trim, cut, fell, and remove therefrom all trees, underbrush, obstructions, and any vegetation, structures, or obstacles within the limits of the easement; 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 #3 Fee Excluding Minerals** - The fee simple title to the land, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines; excepting and excluding all (coal) (oil and gas), in and under said land and all appurtenant rights for the exploration, development, production and removal of said (coal) (oil and gas), but without the right to enter upon or over the surface of said land for the for the purpose of exploration, development, production and removal therefrom of said (coal) (oil and gas).

**Standard Estate # 8 "Channel Improvement Easement**
A perpetual and assignable right and easement to construct operate and maintain channel improvement works on, over and across (the land described in Schedule A) (Tract Nos. ____,____) for the purposes as authorized by the Act of Congress approved _____ , including the right to clear, cut, fell, remove and dispose of any and all timber, trees, underbrush, buildings, improvements and/or other obstructions therefrom; to excavate: dredge, cut away, and remove any or all of said land and to place thereon dredge or spoil material; and for such other purposes as may be required in connection with said work of improvement; reserving, however, to the owners, 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 # 13 Utility and/or Pipeline Easement**
A perpetual and assignable easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. _____,_____ and _____), for the location, construction, operation, maintenance, alteration; repair and patrol of (overhead) (underground) (specifically name type of utility or pipeline); together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, 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 #15 Temporary Work Area Easement** - A temporary easement and right-of-way in, on, over and across the land described, for a period not to exceed ___ months, 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 a (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 there from all trees, underbrush, obstructions, and any other vegetation, structures, 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.

## Navigational Servitude

The non-Federal sponsor is responsible for performing, or assuring the performance of, all pipeline relocations necessary for the project. Costs borne by the non-Federal sponsor to perform or assure the performance of all utility relocations will be creditable against the NFS's required additional 10 percent repayment requirement at the end of the project. A table of all identified pipelines for this project is shown on Exhibit "H" of the REP. A cost estimate will be developed for the plan carried forward for feasibility-level design. The exercise of the navigation servitude and the enforcement of Section 10 permits to accomplish relocations are authorities exclusive to the Federal Government and therefore are within the Government's discretion

## Mitigation Feature

The main effects of the TSP on significant natural resources would be impacts to oyster reef and unvegetated estuarine bay and river bottom. The impacts to oyster reef would be permanent in nature, while those to estuarine bay and river bottom would be more of a temporary effect with concern to benthic infauna and use by fish species. That said, a mitigation feature will be required for this project. The mitigation feature will restore oyster reefs located along the HSC. There are currently 18 potential mitigation sites identified by Texas Parks and Wildlife for this project. The restoration sites will be located at Trinity Bay, Fishers, Bayport, San Leon, and Dollar as shown in **Exhibit "F".**

## Aids to Navigation

At the time of this REP, aids to navigation areas have not been determined. These areas will be developed post TSP if needed.

## Lands Owned by the NFS, Lands Owned by the United States, and Existing Federal Projects

This channel improvement project will be overlapping the existing HSC project as discussed in the "Purpose" section of this REP. The alignment of the TSP is located mostly on open waters of Galveston Bay and HSC. Portions of the additional submerged lands required over Galveston Bay are owned by TXGLO and will be utilized under navigational servitude. 50 TXGLO submerged tracts were identified as being utilized under navigational servitude. These tracts are located in the CW1 BR-BCC measure. A table of these tracts are shown in Exhibit "C". 45 Tracts were identified as NFS owned land via patent by the State of Texas. The PHA currently has a development easement extending approximately 230 feet from the improved channel toe along the north side of the BSC for future development. A table of these tracts are shown in Exhibit "D". These submerged lands are located at the BSC and BCC through the upper bayou of this project.

## Borrow Material

Additional placement areas have not been determined at the time of this REP. This section will be updated when location of placement area and source of the borrow material have been determined.

## Access/Staging

The majority of the proposed work will be in open water constructed exercising navigational servitude for access and staging. There will be portions of work that will need staging areas however, at the time of this REP the access/ staging areas have not been determined. These areas will be developed after ADM.

## Recreation Feature

The proposed Project does not have any recreation features.

## Project Induced Flooding

No Project induced flooding will result from the construction of the Project.

## Baseline Cost Estimate

The baseline cost estimate was determined by analyzing each measure within each alternative and identifying real estate related impacts. For this estimate the majority of the proposed work will be in open water constructed on submerged lands exercising navigational servitude in the CW1 BR-BCC measure which is primarily in the Galveston Bay. Submerged lands located at the BSC and BCC through the upper bayou of this project are owned by the NFS via patent by the State of Texas.

At this phase of the study no lands have been identified as being needing to be acquired. This report will be updated if lands are identified as needing to be acquired during the DMMP phase for the placement of dredged material. In the event that lands will be needed for upland placement of dredged material and/or shoreline lands for channel improvement the real estate baseline cost will significantly be increased. The increase in cost will be associated to land cost and all cost incurred to acquire lands for the NFS and federal cost to review NFS work. REP cost determined are for administration cost for pipeline relocations, project administration cost and LERRD crediting cost for alternative 8 is detailed in **Exhibit "G".**

**Real Estate BCE for Alternative 8**

Non-Fed: $105,750.00

Fed: $33,900.00

## P.L. 91-646 Relocation Assistance Benefits Anticipated

At this phase of the study no lands have been identified as being needing to be acquired, therefore PL 91-646 assistance is not required. However, this section of the REP will be updated if lands are identified as needing to be acquired during the DMMP phase and PL 91-646 will be needed. In the event that 91-646 relocations will be required, the PL 91-646 section and the RE baseline cost estimate will be adjust accordingly.

## Present of Anticipated Mineral Activity that May affect the Project

No mineral activity will be interrupted by the project. The predominant type of mineral activity in the vicinity of the project is oil and gas exploration and production. No oil or gas structures have been identified as being impacted by this project.

## Assessment of the NFS's Legal and Professional Capability and Experience to Acquire and Provide LERRD for the Project.

An Assessment of the Non-Federal Sponsor's Acquisition Capabilities survey has been sent to the NFS and at the time of this draft, survey responses has not been received. The REP will be updated after the NFS's responses have been submitted.

## Application or Enactment of Zoning Ordinances Proposed in connection with the Project

No application or enactment of zoning ordinance is proposed in connection with this project.

## Land Acquisition Schedule

At this phase of the study no lands have been identified as needing to be acquired therefore no land acquisition schedule has been determined.

## Description of Facility or Utility Relocation

The NFS conducted an analysis of pipelines crossing the channel relocations. The data was derived from PHA license data, permit documents, as-built documents, and state and federal databases. PHA has assessed all available data pipelines crossing the HSC and this report focuses efforts on the lines with potential impact. A total of 215 pipelines were identified with 11 pipelines as needing to be removed or relocated as a result of the proposed project. These pipelines are located in the *CD4- whole measures*.

The non-Federal sponsor is responsible for performing, or assuring the performance of, all pipeline relocations necessary for the project. Costs borne by the non-Federal sponsor to perform or assure the performance of all utility relocations will be creditable against the NFS's required additional 10 percent repayment requirement at the end of the project. A table of all identified pipelines for this project is shown on **Exhibit "H"** of the REP. All pipelines highlighted in yellow represent the pipelines impacted by this project. A cost estimate will be developed for the plan carried forward for feasibility-level design. The exercise of the navigation servitude and the enforcement of Section 10 permits to accomplish relocations are authorities exclusive to the Federal Government and therefore are within the Government's discretion.

## HTRW or Other Environmental Contaminants.

The proposed alternative has the potential to impact an existing EPA National Priorities List (NPL) site, known as the Patrick Bayou NPL site. The Patrick Bayou site is undergoing assessment and cleanup under the CERCLA; the site is potentially a continuing source of sediment contaminated with PAHs,

PCBs, and metals to the HSC. The channel widening measure from the San Jacinto Monument to Boggy Bayou would widen the existing Federal channel to include a small portion of land at the mouth of Patrick Bayou. Due to the verified contamination in sediment in the bayou, and the continuing discharge from the bayou into the HSC, the proposed alternative may encounter those sediments. Further evaluation is needed in order to assess the risk to the proposed project posed by the Patrick Bayou site. Additionally, widening the channel from Boggy Bayou to Greens Bayou would involve the acquisition of a small portion of land currently owned by the Texas Deepwater Terminal. If this land was to be acquired, the nonfederal sponsor must ensure that the land is clean and free of contaminants before inclusion into the federal project. All other measures in this alternative will have no effect in relation to known HTRW. HTRW sites can be found in near proximity to the proposed project footprint as shown in **Exhibit "I"**. These sites are listed below, along with the action recommendation.

| Site | Location | REC | Action Recommendation |
|---|---|---|---|
| Patrick Bayou | 1.8 mi E of Beltway 8 Bridge, Harris County | NPL site, sediment contaminated with PAHs, metals, and PCBs | Further investigation needed to evaluate potential for contaminated sediments to enter HSC |
| San Jacinto Waste Pits | Immediately N of I10 bridge @ San Jacinto River, Channelview | NPL site, sediment contaminated with dioxin | Chemical sediment quality sampling within HSC portion of AOC, in accordance with 2009 EPA public notice |
| Pasadena Refining System | 0.25 mi E of Washburn Tunnel, Pasadena | Past RCRA investigations and corrective actions, TSDF, active institutional controls | No action needed. However, further investigation will be needed if widening occurs in this reach of the HSC |
| South Coast Terminals | 0.1 mi E of I610 bridge, Houston | Past state enforcement orders, active VCP remediation ongoing, soil and GW contaminated with VOCs, BTEX, and PAHs | Avoidance of widening measures in this area of HSC |
| Lone Star Industries | 0.1 mi E of Brady Island, Houston | Active VCP investigation ongoing, soil and GW contaminated with VOCs, SVOCs, metals, and TPH | Avoidance of widening measures in this area of HSC |
| Pasadena Terminal | 0.4 mi S of Hunting Bayou, Pasadena | Past state enforcement orders, active institutional controls | No action needed. However, further investigation will be needed if widening occurs in this reach of the HSC |
| Oxid, LP | 0.1 mi E of I610 bridge, Houston | Active VCP remediation ongoing, soil and GW contaminated with solvents and metals | Avoidance of widening measures in this area of HSC |

| | | | |
|---|---|---|---|
| San Jacinto Ordnance Depot | Immediately E of Beltway 8 Bridge, Houston | Unresolved munitions and future use concerns, GW contaminated with mercury | No action needed. However, if the site is considered for dredged material placement, resolution of existing concerns is required. |

## Discussion of Known or Anticipated Support for or Opposition to the Project by Landowners in the Project Area.

There is no known opposition to the Project by landowners in the Project area.

## Statement to Non-Federal Sponsor Regarding the Risks Associated with Acquiring Land Before the Execution of the PCA.

At this phase of the study no lands have been identified as being needing to be acquired. If lands are identified as needing to be acquired during the DMMP phase, a "Risk Associated with Acquiring Land before Execution of the PCA letter" will be sent to the NFS.

## Description of Any Other Real Estate Issues Relevant to Planning, Designing, or Implementing the Project.

At this phase of the study no lands have been identified as being needing to be acquired. This report will be updated if lands are identified as needing to be acquired during the DMMP phase for the placement of dredged material. In the event that lands will be needed for upland placement of dredged material and/or shoreline lands for channel improvement the real estate baseline cost will significantly be increased. The increase in cost will be associated to land cost and all cost incurred to acquire lands for the NFS and federal cost to review NFS work.

Access/ Staging/ Temporary easements- At this phase of the study; access, staging, and temporary staging areas have not been determined, therefore these cost were not captured at the time this REP was drafted.

EXHIBIT A

# The Study Area


## The Houston Ship Channel

For this study effort, the ship channel has been divided into six segments:

- Bay Reach
- Bayport Channel
- Barbours Cut Channel
- Boggy Bayou to Sims Bayou
- Sims Bayou to I-610 Bridge
- I-610 Bridge to Turning Basin

N

***Map is not to scale and representational***

EXHIBIT B

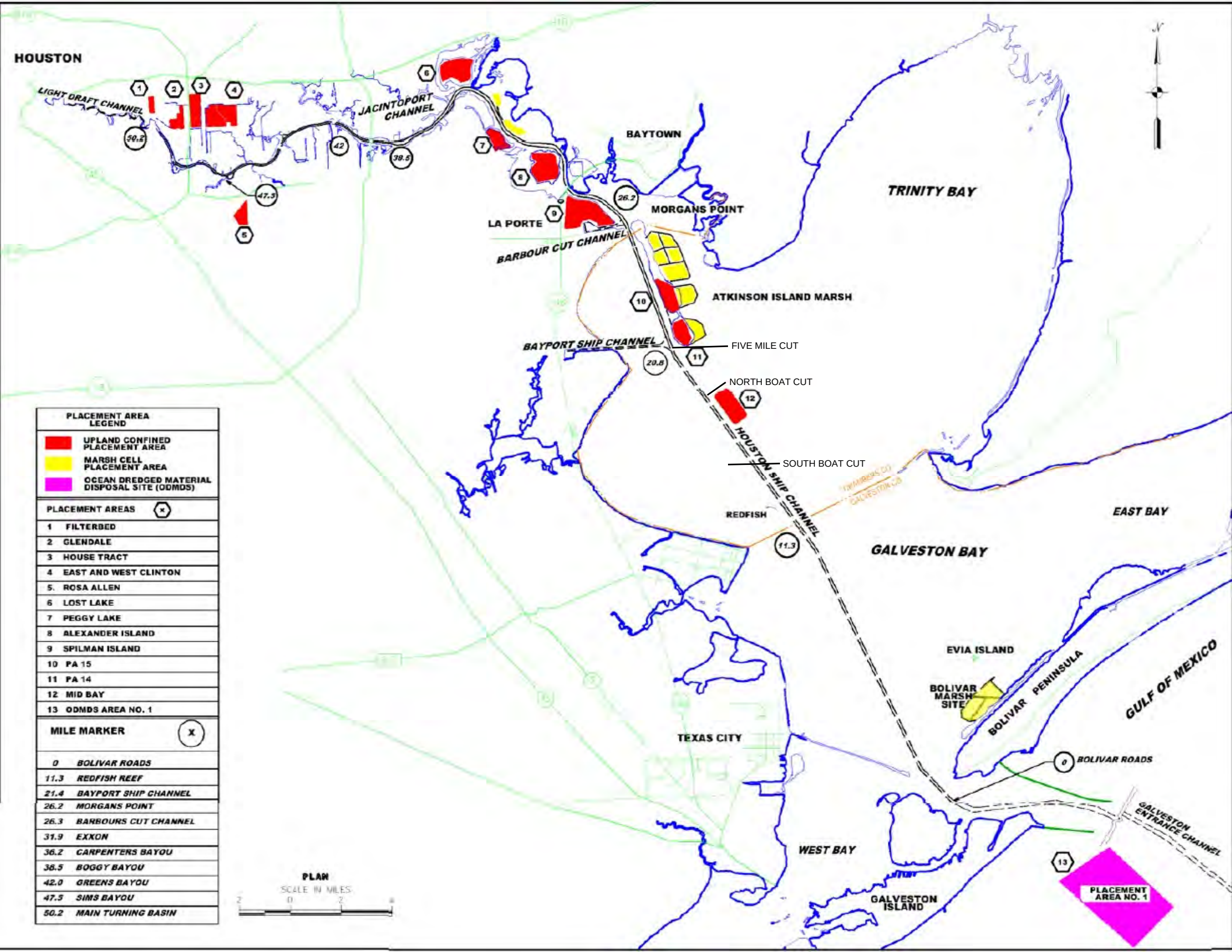

HOUSTON
LIGHT DRAFT CHANNEL
JACINTOPORT CHANNEL
BAYTOWN
TRINITY BAY
LA PORTE
MORGANS POINT
BARBOUR CUT CHANNEL
ATKINSON ISLAND MARSH
BAYPORT SHIP CHANNEL
FIVE MILE CUT
NORTH BOAT CUT
SOUTH BOAT CUT
HOUSTON SHIP CHANNEL
REDFISH
EAST BAY
GALVESTON BAY
EVIA ISLAND
BOLIVAR MARSH SITE
BOLIVAR PENINSULA
GULF OF MEXICO
TEXAS CITY
BOLIVAR ROADS
GALVESTON ENTRANCE CHANNEL
WEST BAY
GALVESTON ISLAND
PLACEMENT AREA NO. 1
PLAN
SCALE IN MILES
PLACEMENT AREA LEGEND
UPLAND CONFINED PLACEMENT AREA
MARSH CELL PLACEMENT AREA
OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)
PLACEMENT AREAS
1 FILTERBED
2 GLENDALE
3 HOUSE TRACT
4 EAST AND WEST CLINTON
5. ROSA ALLEN
6 LOST LAKE
7 PEGGY LAKE
8 ALEXANDER ISLAND
9 SPILMAN ISLAND
10 PA 15
11 PA 14
12 MID BAY
13 ODMDS AREA NO. 1
MILE MARKER
0 BOLIVAR ROADS
11.3 REDFISH REEF
21.4 BAYPORT SHIP CHANNEL
26.2 MORGANS POINT
26.3 BARBOURS CUT CHANNEL
31.9 EXXON
36.2 CARPENTERS BAYOU
38.5 BOGGY BAYOU
42.0 GREENS BAYOU
47.5 SIMS BAYOU
50.2 MAIN TURNING BASIN

EXHIBIT C

# State Tract Only Register

| Measure Name | State Tract | Acres in State Tract | Map Sheet | Measure Total Acres |
|---|---|---|---|---|
| CW1_900 | 346 | 15.49 | 12 | 2476.67 |
| CW1_650 | 345 | 23.90 | 12 | 1292.24 |
| CW1_900 | 345 | 97.39 | 12 | 2476.67 |
| CW1_900 | 344 | 32.50 | 12 | 2476.67 |
| CW1_900 | 338 | 3.97 | 12 | 2476.67 |
| CW1_820 | 337 | 95.66 | 12 | 2133.59 |
| CW1_900 | 337 | 108.47 | 12 | 2476.67 |
| CW1_820 | 336 | 67.43 | 11 | 2133.59 |
| CW1_900 | 336 | 74.86 | 11 | 2476.67 |
| CW1_820 | 327 | 14.48 | 11 | 2133.59 |
| CW1_820 | 326 | 108.45 | 11 | 2133.59 |
| CW1_900 | 326 | 120.16 | 11 | 2476.67 |
| CW1_900 | 325 | 49.73 | 11 | 2476.67 |
| CW1_820 | 313 | 2.85 | 11 | 2133.59 |
| CW1_820 | 312 | 79.33 | 11 | 2133.59 |
| CW1_900 | 312 | 91.62 | 11 | 2476.67 |
| BE1_078_844_228 | 311 | 14.12 | 10 | 69.00 |
| CW1_900 | 311 | 67.46 | 10 | 2476.67 |
| CW1_900 | 287 | 0.02 | 10 | 2476.67 |
| CW1_650 | 286 | 37.21 | 10 | 1292.24 |
| CW1_900 | 286 | 68.88 | 10 | 2476.67 |
| CW1_650 | 264 | 10.11 | 10 | 1292.24 |
| CW1_900 | 264 | 24.82 | 10 | 2476.67 |
| CW1_900 | 261 | 11.47 | 9 | 2476.67 |
| CW1_900 | 252 | 30.99 | 8 | 2476.67 |
| CW1_650 | 251 | 60.17 | 9 | 1292.24 |
| CW1_900 | 251 | 112.05 | 9 | 2476.67 |
| CW1_650 | 250 | 70.61 | 9 | 1292.24 |
| CW1_900 | 250 | 101.35 | 9 | 2476.67 |
| CW1_900 | 249 | 14.00 | 9 | 2476.67 |
| CW1_900 | 219 | 81.58 | 8 | 2476.67 |
| CW1_650 | 218 | 71.79 | 8 | 1292.24 |
| CW1_900 | 218 | 113.08 | 8 | 2476.67 |
| CW1_900 | 217 | 63.68 | 8 | 2476.67 |
| CW2_BSC_455 | 216 | 1.45 | 8 | 84.39 |
| MM2_BSC_1800 | 215 | 65.76 | 7 | 80.58 |
| CW1_900 | 211 | 1.69 | 6 | 2476.67 |
| BE1_138_369_228 | 137A | 14.19 | 13 | 32.34 |

| | | | | |
|---|---|---|---|---|
| CW1_820 | 137A | 10.66 | 13 | 2133.59 |
| BE1_128_731_228 | 134A | 1.56 | 13 | 38.59 |
| CW1_900 | 134A | 25.51 | 13 | 2476.67 |
| BE1_138_369_228 | 133A | 18.15 | 13 | 32.34 |
| CW1_900 | 133A | 37.19 | 13 | 2476.67 |
| BE1_128_731_228 | 131A | 33.35 | 13 | 38.59 |
| CW1_820 | 131A | 54.70 | 13 | 2133.59 |
| CW1_820 | 130A | 56.89 | 13 | 2133.59 |
| CW1_900 | 129A | 19.27 | 12 | 2476.67 |
| CW1_820 | 128A | 3.26 | 12 | 2133.59 |
| CW1_900 | 124 | 16.21 | 6 | 2476.67 |
| CW1_900 | 122 | 40.80 | 6 | 2476.67 |

EXHIBIT D

# Navigation District and State Tract Register

| Measure Name | Acres | Map Sheet | State Tract Number | Navigation District | Waterbody | NavDist FILE_NO | NavDist Land_ID |
|---|---|---|---|---|---|---|---|
| BE1_153_06 | 19.71 | 5 | H | Houston Port Authority | San Jacinto River | | 133504 |
| BE1_153_06 | 17.76 | 5 | I | Houston Port Authority | San Jacinto River | | 133504 |
| BE1_246_54 | 8.15 | 4 | G | Houston Port Authority | San Jacinto River | | 133504 |
| BE2_BSCFlare | 0.07 | 8 | 209 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| BE2_BSCFlare | 4.04 | 8 | 210 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| BE2_BSCFlare | 1.52 | 8 | 216 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| BETB3_BCCFlare_1800NS | 35.15 | 5 | 1 | Houston Port Authority | San Jacinto Bay | | 133504 |
| BETB3_BCCFlare_1800NS | 0.19 | 5 | 2 | Houston Port Authority | San Jacinto Bay | | 133504 |
| CD4_Whole | 1.31 | 2 | B | Houston Port Authority | Buffalo Bayou | | 133504 |
| CD4_Whole | 7.26 | 2 | B-1 | Houston Port Authority | Buffalo Bayou | | 133504 |
| CD4_Whole | 8.90 | 2 | B-2 | Houston Port Authority | Buffalo Bayou | | 133504 |
| CD4_Whole | 0.38 | 2 | NONE_1 | Houston Port Authority | Hunting Bayou | | 133504 |
| CD4_Whole | 31.21 | 1 | NONE_2 | Houston Port Authority | Buffalo Bayou | | 133504 |
| CD5_Whole | 8.35 | 1 | NONE_2 | Houston Port Authority | Buffalo Bayou | | 133504 |
| CD6_Whole | 7.90 | 1 | NONE_2 | Houston Port Authority | Buffalo Bayou | | 133504 |
| CW1_650 | 3.64 | 8 | 209 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW1_650 | 3.37 | 8 | 210 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW1_820 | 4.69 | 8 | 209 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW1_820 | 8.63 | 8 | 210 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW1_900 | 4.97 | 8 | 209 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW1_900 | 11.58 | 8 | 210 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW1_HOG_600 | 0.21 | 5 | 1 | Houston Port Authority | San Jacinto Bay | | 133504 |
| CW1_HOG_600 | 8.77 | 5 | 2 | Houston Port Authority | San Jacinto Bay | | 133504 |
| CW1_HOG_600 | 13.12 | 5 | 11 | Houston Port Authority | San Jacinto Bay | | 133504 |
| CW1_HOG_600 | 6.47 | 5 | I | Houston Port Authority | San Jacinto River | | 133504 |
| CW1_SJM_BB | 24.62 | 2 | B | Houston Port Authority | Buffalo Bayou | | 133504 |
| CW1_SJM_BB | 42.79 | 3 | C | Houston Port Authority | Buffalo Bayou | | 133504 |
| CW2_BSC_455 | 5.69 | 8 | 210 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW2_BSC_455 | 2.89 | 7 | 214 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW2_BSC_455 | 16.94 | 7 | 215 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW2_BSC_455 | 4.08 | 8 | 216 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| CW3_BCC_455 | 27.60 | 5 | 1 | Houston Port Authority | San Jacinto Bay | | 133504 |
| CW4_BB_GB | 9.45 | 2 | B | Houston Port Authority | Buffalo Bayou | | 133504 |
| CW4_BB_GB | 27.12 | 2 | B-1 | Houston Port Authority | Buffalo Bayou | | 133504 |
| CW4_BB_GB | 12.48 | 2 | B-2 | Houston Port Authority | Buffalo Bayou | | 133504 |
| MM1_520_00 | 51.44 | 3 | D | Houston Port Authority | Buffalo Bayou | | 133504 |
| MM1_AI_d | 95.00 | 5 | H | Houston Port Authority | San Jacinto River | | 133504 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MM1_AI_d | 0.05 | 5 | I | Houston Port Authority | San Jacinto River | | 133504 |
| MM2_BSC_1800 | 14.81 | 7 | 215 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| TB2_BSCRORO_1800 | 12.39 | 7 | 215 | Houston Port Authority | Galveston Bay | S-1014 | 278 |
| TB4_775_00 | 34.02 | 2 | B-1 | Houston Port Authority | Buffalo Bayou | | 133504 |
| TB4_775_00 | 0.94 | 2 | B-2 | Houston Port Authority | Buffalo Bayou | | 133504 |
| TB4_Hunting | 1.92 | 2 | NONE_1 | Houston Port Authority | Hunting Bayou | | 133504 |
| TB4_Hunting | 5.18 | 2 | NONE_2 | Houston Port Authority | Buffalo Bayou | | 133504 |
| TB6_Brady_900 | 4.18 | 1 | NONE_2 | Houston Port Authority | Buffalo Bayou | | 133504 |

EXHIBIT E

TB6 Brady
CD6 Whole
CD5 Whole
Houston Ship Channel
CD4 Whole
TB4 Hunting
Hunting Bayou
Greens Bayou
TB4 775+00
CW4 BB-GB
Boggy Bayou
CW1 SJM BB
MM1 520+00
San Jacinto State Pa
CW1 BSC-BCC
CW1 BR-BCC
CW1 Redfish-BSC
CW1 BR-Redfish
Midbay PA
Clear Lake
Galveston Bay
Smith Point
Redfish Island
Houston Ship Channel
Eagle Point
BE1 78+844
Dickinson Bayou
Bolivar Marsh Cells
Texas City Dike
BE1 128+731
BE1 138+369
Galveston Harbor
Galveston Island
BE1 246+54
Alexander Island
MM1 AI
BE1 153+06
CW1 Hog
Hog Island
BETB3 BCCFlare
Barbors Cut Channel
CW3 BCC
BE1 28+605
CW2 BSC
Bayport Ship Channel
MM2 BSC
BE2 BSCFlare
TB2 BSCRORO

The best combination of 1, 2, or 3 of these widening measures to be selected for the alternative. Widening by 120 ft, 290 ft, and 370 ft being analyzed.

**Legend**

- Existing Ship Channel
- Turning Basin

**Channel Deepening**

- CD4 Whole (up to 5 feet)
- CD5 Whole (up to 4 feet)
- CD6 Whole (up to 4 feet)
- Channel Widening (endpoints shown)
- Bend Easing
- Mooring

Note: Alternative 8 will include all of the best performing alternatives or portions thereof from Alternatives 1 through 7 in an attempt to maximize net benefits and achieve system-wide improvement.

0 9,000 18,000 Feet

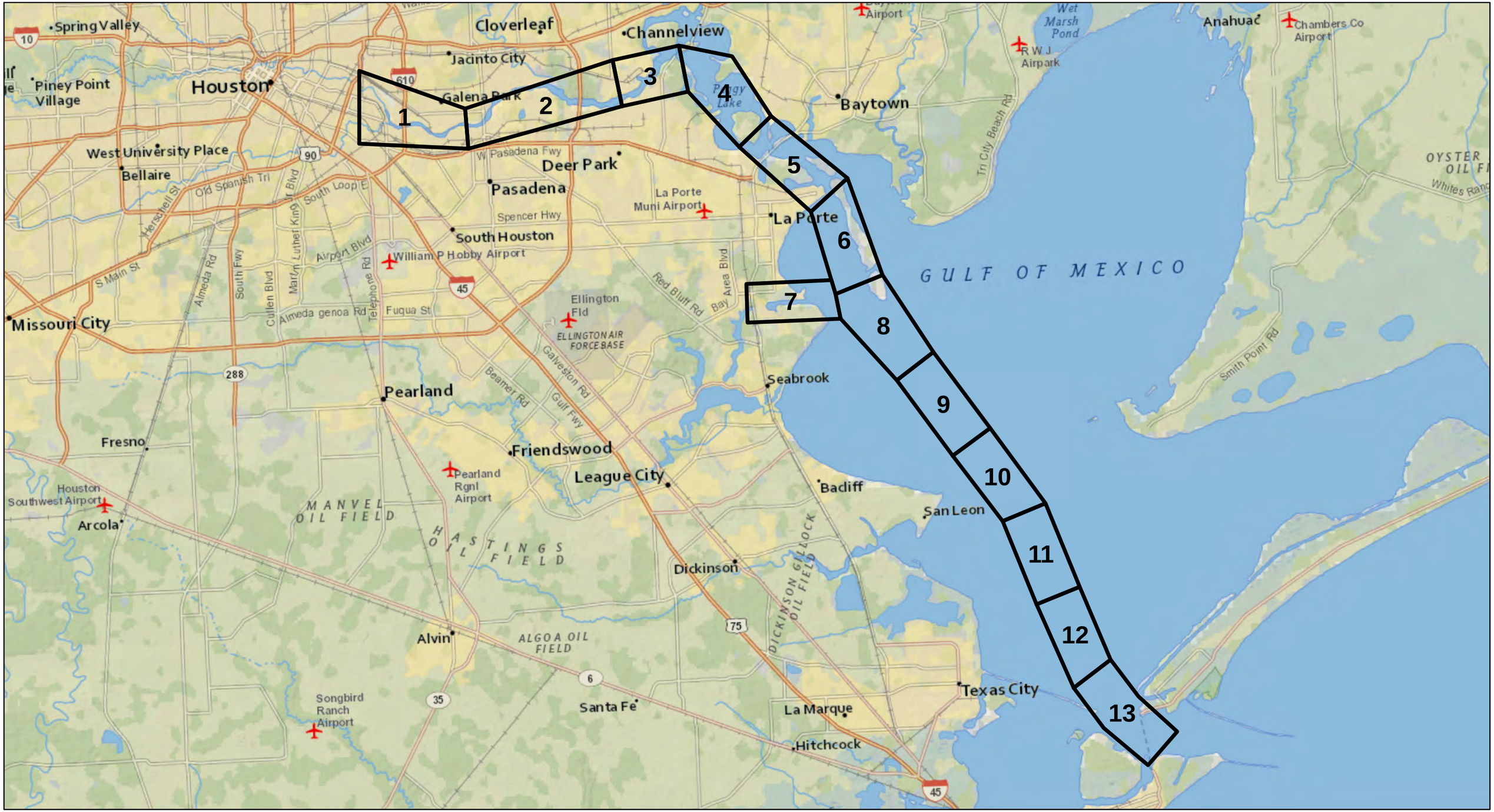
# ALTERNATIVE 8 – The Everything Plan (as indicated by economic analysis)

**U.S. Army Corps of Engineers and Port of Houston Authority**

**Houston Ship Channel Expansion**
**Channel Improvement Project**
**Alternate Map**

US Army Corps of Engineers BUILDING STRONG®

Document Path: P:\ PWD\Port of Houston\60345436 - HSC Nav Study\1200 HSC 216 Study\09 GIS CADD\GIS\Alternatives MapsVAlt 8 Formulation Illustration.mxd




N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL

0 5 10 Miles

# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

The data is only a representation of features on the earth compiled by computer program from raw data obtained from different sources and is not necessarily, in whole or in part, based upon any physical recording, study or survey, professional or otherwise, of the covered property. This information is not intended as a substitute for a field survey by a licensed professional or any other use or application that requires legal or engineering accuracy.

US Army Corps of Engineers ®
Galveston District




Harris County Parcel
HSC Measures
State Owned Submerged Tract
Houston Port Authority
Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 0.5 1 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel
HSC Measures
State Owned Submerged Tract
Houston Port Authority
Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL

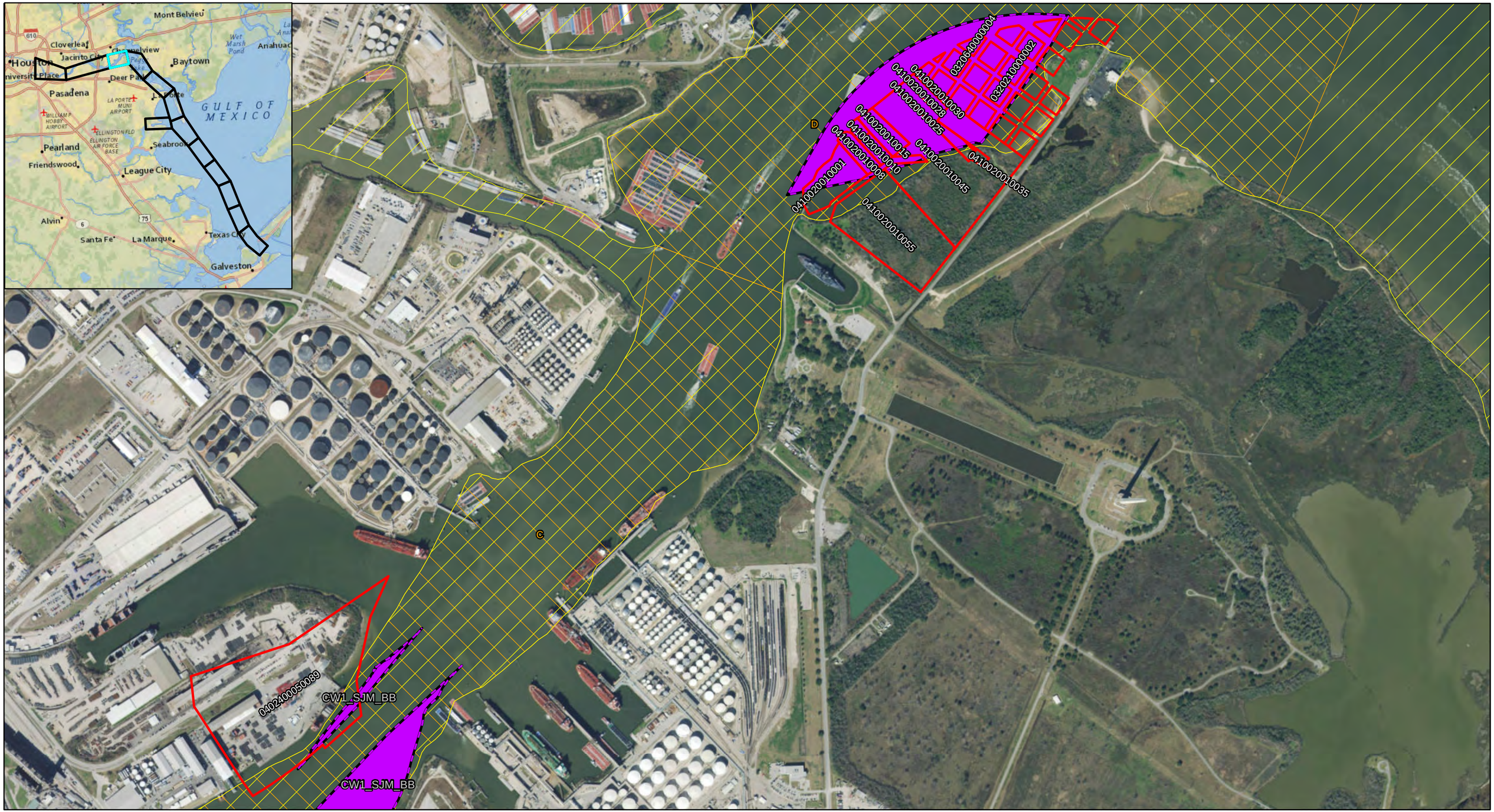


# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 0.5 1 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 0.25 0.5 Miles



US Army Corps of Engineers ®
Galveston District


Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL

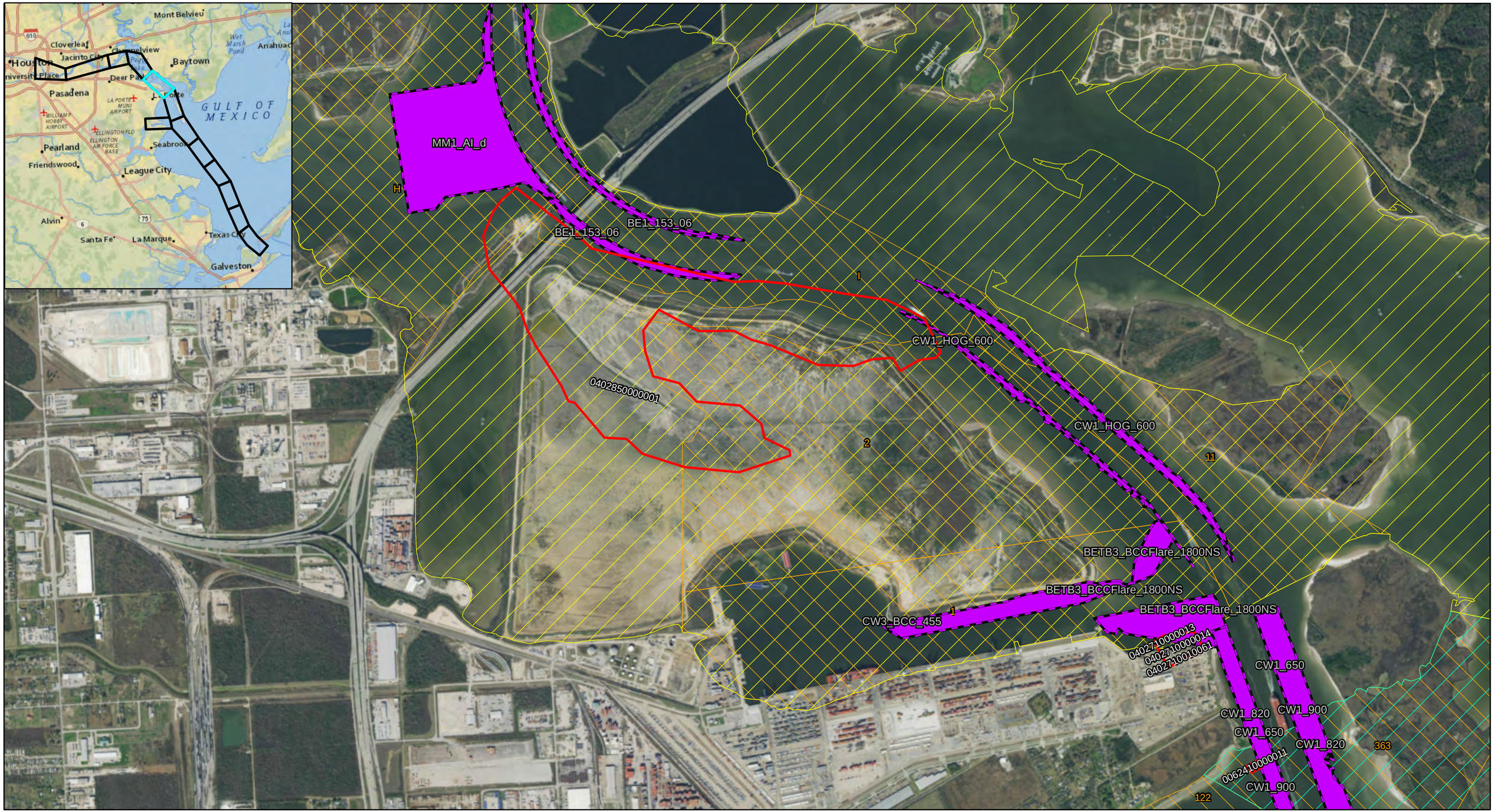


# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 0.5 1 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

N
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DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 0.5 1 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 0.5 1 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 0.5 1 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel
HSC Measures
State Owned Submerged Tract
Houston Port Authority
Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 1 2 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

N

W E

S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 1 2 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 1 2 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

N W E S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 1 2 Miles



US Army Corps of Engineers ®
Galveston District




Harris County Parcel

HSC Measures

State Owned Submerged Tract

Houston Port Authority

Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 1 2 Miles



US Army Corps of Engineers ®
Galveston District


345
129A
344
128A
CW1_650
130A
CW1_820
CW1_650
CW1_900
CW1_650E
131A
CW1_820
134A
BE1_128_731_228
131A
134A
CW1_650
137A
133A
BE1_138_369_228
CW1_900
137A
CW1_650

Harris County Parcel
HSC Measures
State Owned Submerged Tract
Houston Port Authority
Chambers and Liberty Counties Navigation District

N
W E
S

DATUM: NORTH AMERICAN 1983
PROJECTION: STATE PLANE
ZONE: 4204 TEXAS SOUTH CENTRAL



# HOUSTON SHIP CHANNEL 45-FOOT EXPANSION CHANNEL IMPROVEMENT FEASIBILITY STUDY

0 1 2 Miles



US Army Corps of Engineers ®
Galveston District

EXHIBIT F


# Potential Mitigation Sites Identified by TPWD

**U.S. Army Corps of Engineers and Port of Houston Authority**

**Legend**

Reef restoration site

**Houston Ship Channel Expansion Channel Improvement Project**

US Army Corps of Engineers BUILDING STRONG®

EXHIBIT G

**Measures**

BE1_138+369
BE1_128+731
BE1_78+844
BE1_28+605
BE1_153+06
BE1_246+54
*CW1_BR-Redfish (105+000)
*CW1_Redfish-BSC (54+000)
*CW1_BSC-BCC (12+000)
*CW1_BR-BCC (0+000)
CW1_Hog (50+00)
CW1_SJM-BB
MM1_AI (309+00)
MM1_520+00
BE2_BSCFlare (27+000)
SA2_BSCFlare
CW2_BSC (100+00)
TB2_BSCRORO (130+00)
MM2_BSC (BSC 130+00)
BETB3_BCCFlare (10+00)
CW3_BCC (45+00)
CW4_BB-GB (750+00)
TB4_775+00
CD4 – Whole (890+00)
TB4_Hunting (920+00)
CD5_Whole (1120+00)
TB6_Brady (1195+00)
CD6_Whole (1230+00)

**Non-Fed**

| Account | Description | Total |
|---|---|---|
| 0102 | Acquisitions (Labor) (20 hrs X $100 for each tract) | $0.00 |
| 0103 | Condemnation Subdivisions ($35,000 each) | $0.00 |
| 0103 | Condemnation ($90,000 per tract, 10% of the tracts) | $0.00 |
| 0105 | Appraisals ($2,000 each) | $0.00 |
| | Survey (20K each Resaca) | $0.00 |
| 0112 | Project Related Administration | $10,000.00 |
| 011501 | Payments by Sponsor (Land) | $0.00 |
| | Pipeline Relocations ($5000 per unit) | $55,000.00 |
| 01 | LERRD Crediting (Admin $500 each pipeline) | $5,500.00 |
| 01 | Title Policy ($300 each tract) | $0.00 |
| | | |
| | Total Admin and payments | $70,500.00 |
| | Contingencies | $35,250.00 |
| | Grand Total non Fed | $105,750.00 |

**Fed Cost**

| Account | Description | Total |
|---|---|---|
| 0102 | Acquisitions (Review RE Planning Documents & Mapping) (4 hrs x $100 an hour each tract) | $0.00 |
| 0105 | Appraisals (5hrs x $120 an hour, each tract) | $0.00 |
| 0112 | Project Related Administration | $5,000.00 |
| 01 | LERRD Crediting ($200 each tract) | $2,200.00 |
| 01 | Pipeline Relocations Attorney's Opinion ($1600 each tract) | $17,600.00 |
| | | |
| | Total Admin & Payments (FED COSTS) | $22,600.00 |
| | Total Contingencies (FED COSTS) | $11,300.00 |
| | Grand Total Fed Costs | $33,900.00 |
| | | |
| | Total Alternative Cost (Fed and Non-Fed) | $139,650.00 |

EXHIBIT H

HSC ECIP Pipeline Inventory

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 600+00 to 700+00 (1) | 1 | Enterprise Houston Ship Channel, L.P. | 2004-0422 | 687+75.06 | 16 | 123.00 | 130 | no | diesel and other liquefied products | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 2 | Enterprise Houston Ship Channel, L.P. | 2004-0422 | 687+75.06 | 12 | 123 | 130 | no | diesel and other liquefied products | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 3 | Enterprise Houston Ship Channel, L.P. | 2004-0422 | 687+75.06 | | | 130 | no | fiber | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 4 | Enterprise Houston Ship Channel, L.P. | 2012-0172 | | 30 | | 208 | no | petroleum products | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 5 | HFOTCO LLC | 1995-0066 | | 24 | | | no | Crude Oil | Robert Riemer | 1201 S. Sheldon Road | Houston, TX 77015 |
| | 6 | Shell Oil Company | 1991-0199 | 690+01.85 | 16 | 80 | 105 | no | Crude Oil | Sean Tackett | sean.tackett@shell.com | |
| 700+00 to 710+00 (2) | 7 | Kinder Morgan Texas Pipeline LP | 2001-0029 | | 12 | 50 | NA | yes | Natural Gas | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 8 | Kinder Morgan Texas Pipeline LP | 2001-0029 | | 12 | 50 | NA | yes | Natural Gas | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 9 | Enterprise Houston Ship Channel, L.P. | 2007-0307 | | 24 | 90 | 100.5 | no | Crude Oil | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 10 | HSC Pipeline Partnership, LLC | 2005-0003 | 705+81 | 12 | 80 | 81 | no | Propane, propylene | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 11 | HSC Pipeline Partnership, LLC | 2004-0468 | 705+81 | 8 | 80 | 83 | no | Isobutane | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12 | Howell | 2003-0192 | | 6 | 60 | | no | natural gas | ? | | |
| | 13 | Natural Gas Pipeline Company | ? | | 6 | 60 | | no | natural gas | ? | | |
| | 14 | Olin Corporation | 1975-0122 | | 10 | 50 | | no | gypsum slurry | ? | | |
| | 15 | Olin Corporation | 1975-0122 | | 10 | 50 | | no | gypsum slurry | ? | | |
| | 16 | Olin Corporation | 1975-0122 | | 10 | 50 | | no | gypsum slurry | ? | | |
| | | | | | | | | | | | | |
| | 17 | Kinder Morgan Crude and Condensate LLC | 2011-0376 | | 24 | 108 | 108.9 | no | Crude and condensate | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 18 | Air Products LLC | 1996-0039 | 722+00 | 6 | 80 | 67 | no | Hydrogen | Thomas Houser | houserts@airproducts.com | |
| 710+00 to 725+00 (3) | 19 | Air Products LLC | 1996-0039 | 722+00 | 6 | 80 | 67 | no | Syngas | Thomas Houser | houserts@airproducts.com | |
| | | | | | | | | | | | | |
| | 20 | HSC Pipeline Partnership, LLC | 1992-0027 | | 8 | 90 | 92 | no | Natural Gas Liquids | Paul Lair | 9420 West Sam | Houston, TX |
| | 21 | INEOS Pipeline Investment Company | 2004-0283 | 779+98 | 16 | 75 | | no | Ethane/Propane | Annette Vogel | P. O. Box 1488 | Alvin, TX 77512 |
| | 22 | Seminole Pipeline Company LLC | 2003-0040 | 779+98 | 20 | | 57 | no | Liquefied Petroleum Products | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 23 | Explorer Pipeline Company | 2000-0248 | 778+83 | 28 | 60 | 60 | no | Gasoline, Diesel, Jet fuel | Bill Sanders | 6846 Canton #300 | Tulsa, OK 74136 |
| | 24 | Colonial Pipeline Company | 1998-0284 | 779+35 | 40 | 110 | | no | Gasoline, Diesel, Kerosene | Michael Herman | 1185 Sanctuary Parkway Suite 100 | Alpharetta, GA 30009 |
| 750+00 to 800+00 (4) | 25 | HFOTCO LLC | 2014-0185 | | 24 | 127 | 138.7 | no | Crude Oil | Robert Riemer | 1201 S. Sheldon Road | Houston, TX 77015 |
| | 26 | Southtex 66 Pipeline Company Ltd | 2007-0350 | 777+34.63 | 8 | 95 | | no | E/P Mix, Propane | Rusty Genson | 10001 Six Pines Dr. | The Woodlands, TX 77380 |

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 27 | Equistar Chemicals, LP | 2002-0088 | | 10 | 68.5 | | no | Ethylene | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 28 | Colonial Pipeline Company | MO-P-0102 | | 36 | | | no | Gasoline, Diesel, Kerosene | Michael Herman | 1185 Sanctuary Parkway Suite 100 | Alpharetta, GA 30009 |
| | 29 | Targa | ? | | 6 | | 72 | no | LPG | Thom O'Brien | 1000 Louisiana, Ste 4300 | Houston, TX 77002 |
| | 30 | Chevron Phillips Chemical LP | 1991-0079 | | 8 | 67 | 75 | | propylene | Rusty Genson | 10001 Six Pines Dr. | The Woodlands, TX 77380 |
| | 31 | Chevron Phillips Chemical LP | 1991-0079 | | 8 | 67 | 75 | | ethylene | Rusty Genson | 10001 Six Pines Dr. | The Woodlands, TX 77380 |
| | 32 | Targa Downstream LP | 2003-0234 | | 8 | 67 | 75 | | LPG | Thom O'Brien | 1000 Louisiana, Ste 4300 | Houston, TX 77002 |
| | 33 | Targa Downstream LP | 2003-0234 | | 8 | 67 | 75 | | LPG | Thom O'Brien | 1000 Louisiana, Ste 4300 | Houston, TX 77002 |
| | 34 | Targa Downstream LP | 2003-0234 | | 8 | 67 | 75 | | LPG | Thom O'Brien | 1000 Louisiana, Ste 4300 | Houston, TX 77002 |
| | 35 | Targa Downstream LP | 2003-0234 | | 8 | 67 | 75 | | LPG | Thom O'Brien | 1000 Louisiana, Ste 4300 | Houston, TX 77002 |
| | 36 | Magellan Terminal Holdings, L.P. | 2004-0284 | 922+70 | 36 | 68.86 | ~-70' | no | liquid petroleum products | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| 800+00 to 900+00 (5) | 37 | Magellan Terminal Holdings, L.P. | 2004-0284 | 922+70 | 36 | 68.86 | ~-70' | no | liquid petroleum products | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| | 38 | Magellan Terminal Holdings, L.P. | 2004-0284 | 922+70 | 14 | 68.86 | ~-70' | no | liquid petroleum products | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| | 39 | Magellan Terminal Holdings, L.P. | 2004-0284 | 922+70 | 14 | 68.86 | ~-70' | no | liquid petroleum products | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | Magellan Terminal Holdings, L.P. | 2004-0284 | 922+70 | 4 | 68.86 | ~-70' | no | conduit | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| | 40a | Kinder Morgan Liquids Terminal LLC | 2015-0113 | | 3 | 146 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 40b | Kinder Morgan Liquids Terminal LLC | 2015-0113 | | 6 | 146 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 40c | Kinder Morgan Liquids Terminal LLC | 2015-0113 | | 20 | 146 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 40d | Kinder Morgan Liquids Terminal LLC | 2015-0113 | | 20 | 146 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 40e | Kinder Morgan Liquids Terminal LLC | 2015-0113 | | 20 | 146 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 41 | Praxair Inc. | 2002-0084 | 892+58.8 | 12 | 50 | ~-55' | yes | oxygen | Mike Carlo | 39 Old Ridgebury Road | Danbury, CT 06810 |
| | 42 | Praxair Inc. | 2002-0084 | 892+58.8 | 12 | 50 | ~-55' | yes | nitrogen | Mike Carlo | 39 Old Ridgebury Road | Danbury, CT 06810 |
| | 43 | Kinder Morgan Liquids Terminal LLC | 2000-0003 | 953+93 | 16 | 60 | | ? | unleaded gasoline | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 44 | Explorer Pipeline Company | 1992-0177 | 954+33.51 | 10 | 90 | | no | refined petroleum | Bill Sanders | 6846 Canton #300 | Tulsa, OK 74136 |
| | 45 | KM Liquids Terminals LLC | 2004-0338 | 954+74.7 | 20 | 68 | | yes | refined products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 46 | KM Liquids Terminals LLC | 2004-0338 | 954+74.7 | 6 | 68 | | yes | refined products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 47 | Phillips 66 Carrier LLC | 2015-0001 | 956+52.33 | 20 | 93 | | no | refined products | Rusty Genson | 10001 Six Pines Dr. | The Woodlands, TX 77380 |
| 900+00 to 970+00 (6) | 48 | KM Liquids Terminals LLC | 2004-0313 | 957+25.5 | 16 | 100 | | no | unleaded gasoline | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 49 | KM Liquids Terminals LLC | 2004-0313 | 957+25.5 | 16 | 100 | | no | unleaded gasoline | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 50 | Kinder Morgan Liquids Terminal LLC | 2006-0370 | | 20 | | 130 | no | kerosene | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 51 | Kinder Morgan Liquids Terminal LLC | 2006-0370 | | 20 | | 130 | no | refined products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 52 | KM Liquids Terminals LLC | 1996-0157 | 958+92.8 | 16 | 80 | | no | refined products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 53 | Valero Refining-Texas, L.P. | 1997-0039 | 958+92.8 | 16 | 80 | | no | refined products | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 54 | Frio LaSalle (RRC) | | | | | | | | | | |
| | 55 | Enterprise Houston Ship Channel, L.P. | 1999-0112 | 979+22.6 | 24 | 75 | 90 | no | crude | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 56 | Champion Tunnel | | | | | | ? | various | | | |
| | 57 | Kinder Morgan (RRC) tunnel? | | | | | | ? | natural gas | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 58 | Kinder Morgan (RRC) tunnel? | | | | | | ? | natural gas | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 59 | Magellan Crude Oil Pipeline Company LP | 2014-0012 | 1018+39 | 16 | 87 | 85 | no | Crude | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| | 60 | City of Houston | MO-K-0011-J | 1020+00 | 60 | 52 (45 fill) | | ? | water | Dale A. Rudick | 611 Walker | Houston, TX 77002 |
| | 61 | City of Houston | MO-K-0011-J | 1020+00 | 60 | 52 (45 fill) | | ? | water | Dale A. Rudick | 611 Walker | Houston, TX 77002 |
| 970+00 to 1025+00 (7) | 62 | City of Houston | MO-K-0011-J | 1020+00 | 60 | 52 (45 fill) | | ? | water | Dale A. Rudick | 611 Walker | Houston, TX 77002 |
| | 63 | Shell Pipeline Company LP | 2000-0068 | 1018+39 | 12 | 87 | 85 | no | Gasoline, jet fuel, diesel | Stephen Van Stone | P. O. Box 2648 | Houston, TX 77252-2648 |

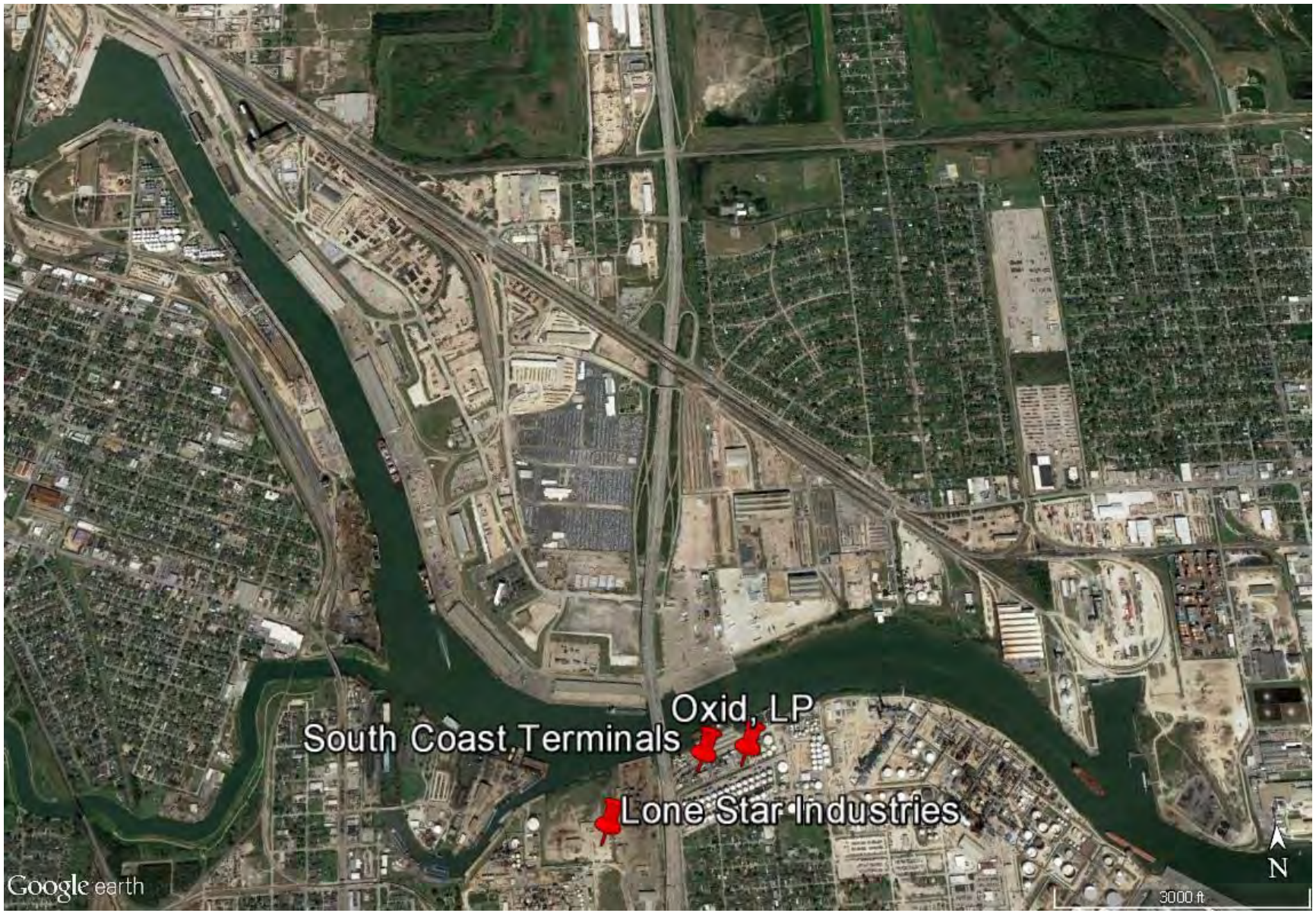
| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 64 | Shell Pipeline Company LP | 2000-0068 | 1018+39 | 12 | 87 | 85 | no | Gasoline, jet fuel, diesel | Stephen Van Stone | P. O. Box 2648 | Houston, TX 77252-2648 |
| | 65 | Magellan Pipeline Company LP | 2014-0357 | | 24 | | 138 | no | crude | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| | 66 | Enterprise TE Products Pipeline Company LLC | 2015-0006 | 103+89.28? | 18 | 58 | | no | Gasoline, jet fuel, diesel | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 67 | BridgeTex Pipeline Company LLC | 2013-0212 | | 24 | | 102 | no | crude | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| | 68 | KM Liquids Terminals LLC | 2014-0122 | | 20 | | 80 | no | crude | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 69 | KM Liquids Terminals LLC | 2014-0122 | | 20 | | 80 | no | crude | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 70 | KM Liquids Terminals LLC | 2014-0122 | | 3 | | 80 | no | conduit | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 71 | Williams Tunnel with multiple pipelines | | | | | 56.7 | no | various | Christie Hill | One Williams Center-MD-17 SE | Tulsa, OK 74172 |
| | 72 | Enterprise Texas Pipeline LLC | 2005-0110 | 1042+96 | 12 | 81 | 83.7 | no | natural gas | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 73 | Cowboy Pipeline Service Company | 2005-0107 | 1042+96 | 10 | 81 | | no | hydrogen | | | |
| | 74 | KM Liquids Terminals LLC | 2005-0111 | 1042+96 | 16 | 81 | | no | refined petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 75 | PL Propylene LLC | 1997-0298 | 1043+50 | 4 | 78 | | ? | propylene | | | |
| | 76 | Enterprise Texas Pipeline LLC | 2007-0175 | | 12 | 100 | 147 | no | natural gas | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1025+00 to 1050+00 (8) | 77 | Seaway Crude Pipeline Company LLC | 2011-0266 | 1045+57.2 | 30 | | 103 | no | crude | Paul Lair | 9420 West Sam Houston Parkway North | Houston, TX 77064-6317 |
| | 78 | Magellan Pipeline Company, LP | 2009-0200 | 1046+77 | 8 | 67 | | no | petroleum products | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| | 78a | Kinder Morgan Liquid Terminals | 2015-0114 | | 3 | 80 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 78b | Kinder Morgan Liquid Terminals | 2015-0114 | | 24 | 80 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 78c | Kinder Morgan Liquid Terminals | 2015-0114 | | 24 | 80 | | no | petroleum products | Suzanne Fikac | 1001 Louisiana, Suite 1000 | Houston, TX 77002 |
| | 78d | Equistar Chemicals, LP | 2014-0273 | | 4 | 84 | | no | propane | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78e | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | toluene, pygas | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78f | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | Cat BB's | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78g | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | isobutylene | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78h | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | C4's | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78i | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | butadiene | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 78j | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | tert-Butyl Alcohol | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78k | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | spare | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78l | Equistar Chemicals, LP | 2014-0273 | | 6 | 84 | | no | ? | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78m | Equistar Chemicals, LP | 2014-0273 | | 8 | 84 | | no | alkylate, raffinate, etc | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 78n | Equistar Chemicals, LP | 2014-0273 | | 16 | 84 | | no | condensate and naptha | Michelle Lloyd | 16055 Space Center Blvd, Ste. 350 | Houston, TX 77062 |
| | 79 | Magellan Pipeline Holdings, LP | 2012-0105 | | 20 | 72 | | no | refined petroleum products | Bryan Young | One Williams Center, OTC-9 | Tulsa, OK 74172 |
| 1050+00 to 1123+00 (9) | 80 | Valero Refining-Texas, L.P. | 2014-0290 | | 16 | | 94 | no | spare | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 81 | Valero Refining-Texas, L.P. | 2014-0293 | | 12 | | 94 | no | spare | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 82 | Valero Refining-Texas, L.P. | 2014-0294 | | 8 | | 94 | no | spare | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 83 | Valero Refining-Texas, L.P. | 2014-0295 | | 16 | | 104 | no | gasoline and distillate | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 84 | Valero Refining-Texas, L.P. | 2014-0296 | | 6 | | 73.5 | no | spare | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 85 | Valero Refining-Texas, L.P. | 2014-0297 | | 4 | | 73.5 | no | spare | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |

| Reach | No. | Company Owner | PHA File # | USACE Station | Pipe Size | Proposed Depth | As-Constructed | width issue | Main Product | Contact | Address | City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 86 | Valero Refining-Texas, L.P. | 2014-0298 | | 24 | | 73.5 | no | spare | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 87 | Valero Refining-Texas, L.P. | 2014-0299 | | 12 | | 104 | no | naphtha | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |
| | 88 | Valero Refining-Texas, L.P. | 2014-0300 | | 16 | | 104 | no | gasoline and distillate | Bryan Young | P. O. Box 696000 | San Antonio, TX 78249-1616 |

EXHIBIT I


Oxid, LP
South Coast Terminals
Lone Star Industries
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Pasadena Terminal
Pasadena Refining System
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San Jacinto Ordnance Depot
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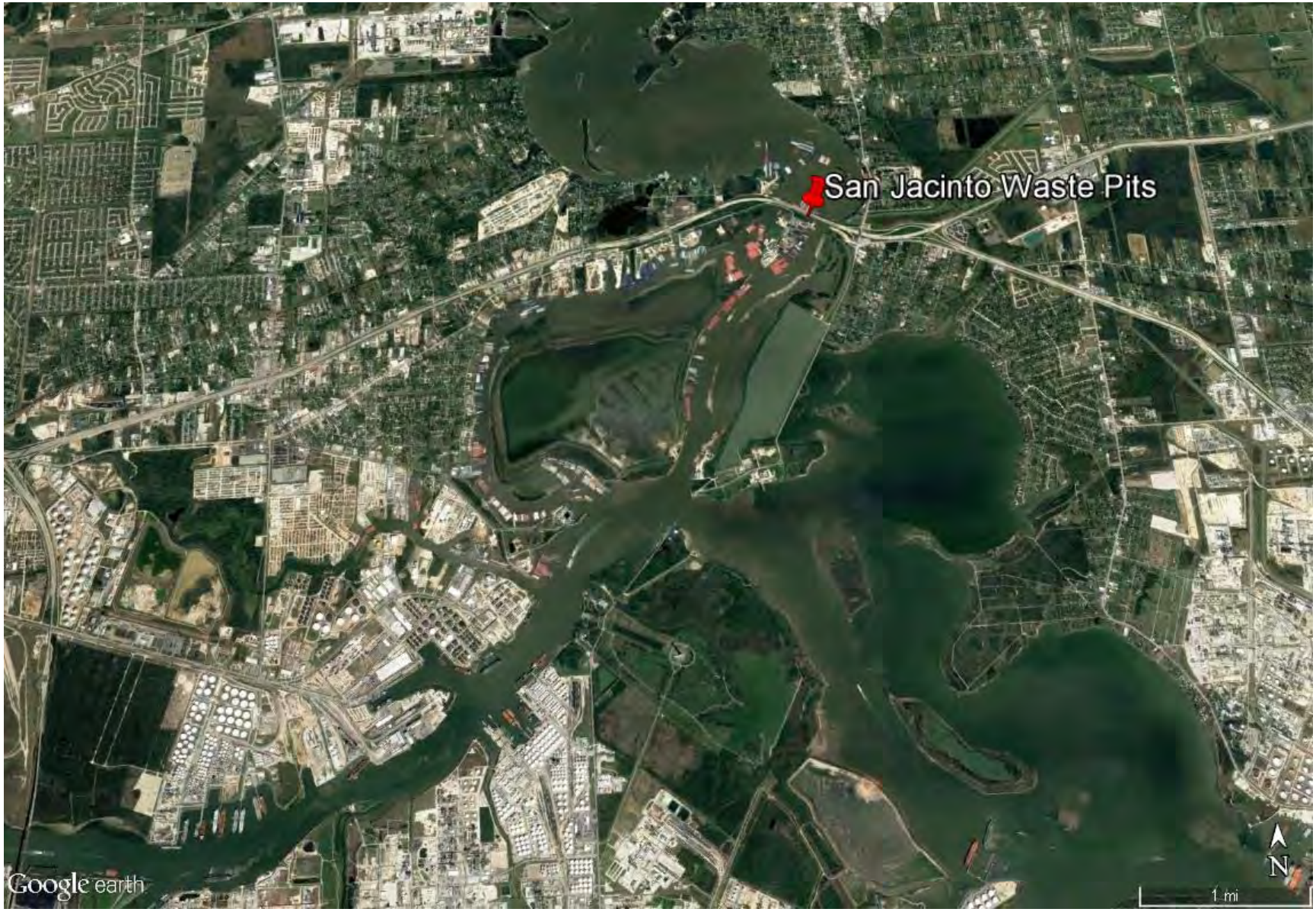
San Jacinto Waste Pits
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