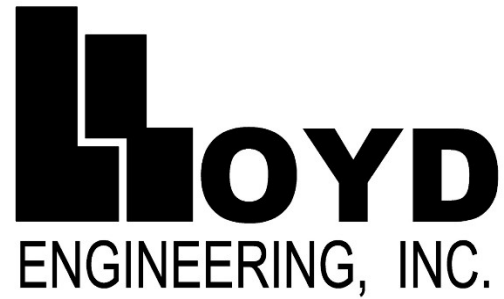


APPENDIX I AQUATIC RESOURCES SURVEY REPORT



**AQUATIC RESOURCES SURVEY REPORT
BLUEWATER SPM PROJECT
NUECES AND ARANSAS COUNTIES, TEXAS**

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Acronyms and Abbreviations

BWTT	Bluewater Texas Terminal LLC
°C	degrees Celsius
E1UB	Estuarine, subtidal, unconsolidated bottom
E2EM	Estuarine, intertidal, emergent
E2SS	Estuarine, intertidal, scrub-shrub
E2US	Estuarine, intertidal, unconsolidated shore
°F	degrees Fahrenheit
GNSS	global navigation satellite system
LEI	Lloyd Engineering, Inc.
MLLW	Mean Lower Low Water
mph	miles per hour
Project	Bluewater SPM Project
SAV	Submerged Aquatic Vegetation
TPWD	Texas Parks and Wildlife Department
USGS	U.S. Geological Survey

1.0 Introduction

Lloyd Engineering, Inc. (LEI) conducted an aquatic resources survey on behalf of Bluewater Texas Terminal LLC (BWTT) for the proposed Bluewater SPM Project (Project). LEI conducted surveys to determine the presence or absence of aquatic resources within the proposed Project area. Surveys were conducted to evaluate the potential for impacts to aquatic resources as a result of construction activities and/or inadvertent returns [related to proposed horizontal directional drilling (HDD) activities] associated with the proposed Project. This report details the findings of an aquatic resources survey conducted for the proposed Project and includes exhibits depicting the extent of aquatic resources and substrate types identified within the Project area.

The Project study areas consist of four irregularly shaped polygons situated around inshore components associated with the proposed Bluewater SPM Project located in Aransas, Nueces, and San Patricio Counties, Texas. The proposed Bluewater SPM Project will be located within the U.S. Army Corps of Engineers (USACE) Galveston District area of responsibility. The proposed Project is located on the U.S. Geological Survey (UGSS) (2019) Aransas Pass, Estes, and Port Aransas, TX, 7.5-minute series topographic quadrangle maps. The proposed inshore pipeline infrastructure originates near Aransas Pass, Texas, crosses to Stedman Island, and parallels State Highway 361 onto Harbor Island where a booster station will be positioned. From this point, the inshore pipelines will cross Lydia Ann Channel onto San Jose Island to extend offshore into the Gulf of Mexico. Refer to Figure 1 (Vicinity Map) in Appendix A for a depiction of the survey area investigated for inshore components associated with the proposed Bluewater SPM Project.

For the purpose of this survey, the Project area was divided into four individual study areas based on proposed HDD crossings. The individual study areas will be referred to herein as:

- Study Area “A” (73-acres);
- Study Area “B” (102-acres);
- Study Area “C” (29-acres); and
- Study Area “D” (84-acres).

Aquatic resources surveys were conducted in February and March 2019 within the four study areas totaling approximately 288 acres. Refer to Figure 1 - Vicinity Map in Appendix A for a depiction the Study Areas.

Based on a preliminary desktop review of aerial imagery, bathymetry, and salinities in the Project area, it was determined that the Project area had potential for oysters and/or submerged aquatic vegetation (SAV). These resources are detailed below in Section 1.1 and 1.2 below.

1.1 American Oysters (*Crassostrea virginica*)

American oysters (*Crassostrea virginica*) are sessile, bi-valved mollusks that occur throughout the Gulf of Mexico in shallow bays, mud flats, and offshore sandy bars (Stanley and Sellers, 1986). Oysters grow well

on a variety of substrates, ranging from rocky bottoms to some types of mud. The presence and growth of oysters are closely correlated with salinity and other abiotic variables.

Oysters spawn from March through November in the northern Gulf of Mexico (Butler, 1954), and the peak of spawning season in Texas waters is between May and early June (Stanley and Sellers, 1986). Spawning is triggered mostly by temperature (above 20 degrees Celsius (°C) for normal spawn and above 25°C for mass spawning (Pattillo, et al., 1997).)

Eggs hatch six hours after fertilization, and oyster larvae remain in the water column as meroplankton for two to three weeks after hatching (Patillo, et al., 1997). Upon settling or attachment, the sessile juveniles are referred to as spat. Spat-fall on the Gulf Coast typically occurs from March to mid-November (Gunter, 1955; Hopkins, 1931). Juveniles begin to develop once larvae attach. In the Gulf, sexual maturity of oysters may occur as soon as four weeks after attachment (Menzel, 1955), but generally maturation occurs at 18 to 24 months of age (Quast, et al. 1988).

Growth rates of adult oysters can vary greatly depending on conditions. Some adult oysters have been documented to grow at a rate of 50 millimeters per year (Butler, 1954). Gunter (1951) provides growth rates of 60 millimeters in the first year, 90 millimeters in the second year, and 115 millimeters in the third year. Based on these growth rates, it is possible for an oyster to reach harvestable size of 76.2 millimeters (3 inches) within two years.

During open season, anyone with a TX Parks and Wildlife Department (TPWD) harvester's license may harvest oysters from areas open to harvesting and sell to dealers certified by the TX Department of Health. The rest of the year, harvest occurs on private oyster leases. Oyster season in TX lasts from November 1 through April 30, however, the TX Department of Health and Safety has the discretion to close the fishery if the water conditions become conducive to propagation of toxic bacteria making oysters unsafe for human consumption.

1.2 Submerged Aquatic Vegetation (Seagrass)

Seagrasses represent a small number of species of marine organisms, but are highly productive communities that support a diversity of life. Seagrasses provide nursery habitat and foraging areas for a number of commercially and recreationally important fish and shellfish species (Hemminga, et al., 2008). This ecosystem provides food resources and protective cover for a number of species and contributes detritus to the open bay bottom food web (Lester and Gonzalez, 2011).

The majority of Texas seagrasses occur along the middle to lower Texas coast. Seagrasses typically thrive in warm, clear waters with higher salinities. *Halodule wrightii*, *Thalassia testudinum*, *Syringodium filiforme*, *Halophila engelmannii*, and *Ruppia maritima* are the five seagrass genera that occur in TX (TPWD, 1999). Table 1-1 includes a description of seagrass species that occur along Texas' coast.

Table 1-1
Seagrasses of Texas

Scientific Name	Common Name	Description
<i>Halodule wrightii</i>	Shoal grass	perennial, subtropical species that often occurs mixed in the higher salinity parts of all Texas bays and estuaries; the most abundant seagrass coastwide with the most extensive beds in Upper Laguna Madre; efficient colonizing species engineered to colonize and proliferate on disturbed, wave dominated, or shallow water areas
<i>Thalassia testudinum</i>	Turtlegrass	tropical species prefers high salinity water in areas buffered from intense wave action; occur as far north as Aransas Bay and are most abundant in the Lower Laguna Madre or Corpus Christi Bay area
<i>Syringodium filiforme</i>	Manateegrass	tropical species usually found in mixed beds alongside turtle and/or shoal grasses, or may be found in monospecific patches; occur as far north as Aransas Bay and are most abundant in the Lower Laguna Madre or Corpus Christi Bay area
<i>Halophila engelmannii</i>	Engelmann's seagrass, star grass, or clover grass	sandy or muddy substrates within sheltered and deeper waters; this species is more shade tolerant than most seagrasses, often occurring as an understory species within mixed seagrass beds
<i>Ruppia maritima</i>	Widgeongrass	technically not a seagrass because it tolerates very low salinity, even fresh water

Sources: TPWD, 1999; University of Texas at Austin, 2015

2.0 Survey Methodology

The Project area was divided into two survey methodologies based on water depth: 1) water depth less than eight feet and 2) water depth greater than eight feet. Seagrasses' elevated light requirements restrict the depth at which they can grow; therefore, underwater light availability is often the limiting factor restricting seagrass survival. Seagrasses are usually found in shallow waters where they are able to receive ample quantities of light and nutrients (TX Seagrass, 2018). For this reason, water depths greater than eight feet were determined as an un-suitable environment for seagrasses to occur. In areas with water depths greater than eight feet, side-scan-sonar (SSS) mapping is proposed to be collected in order to help verify the presence or absence of oyster resources and to characterize the substrate types in these areas. The results of the SSS survey are not included in this report and will be provided under a separate report cover. The survey plan below describes the methods used in the less than eight-foot-deep portions of the Project.

2.1 Survey Plan

The survey plan within the Project area included approximately 288 acres inside four irregularly shaped polygons (Survey Area A, Survey Area B, Survey Area C, and Survey Area D). Prior to the survey, the TPWD's web-based *Seagrass Viewer* mapping tool was reviewed to determine if any recorded seagrass beds were located within the Project area. Aerial imagery, bathymetry, water quality, and tide data were also reviewed to determine current and past site conditions.

A 50-foot-on-center point intersect transect grid (transect grid) was produced using ESRI's ArcGIS mapping software and loaded onto a Trimble GeoExplorer 6000 global navigation satellite system (GNSS) unit as a background layer. An aerial view of the transect grid is provided as Appendix A - Figure 2a to 2d. Utilizing the Trimble GNSS unit for navigation, the transect grid was traversed by wading, kayaking, or via boat. Substrate observations were recorded at each 50-foot intersection of the transect grid where the depth of water was less than eight feet; recorded field transect data sheets are provided as Appendix B. In water depths traversed by wading, substrate types were characterized by sight or by feel (braille technique). Within water depths traversed by kayaked or survey boat, an eight-foot-long aluminum sounding pole, with a three-inch disk affixed on one end and a penetration point on the other end, was used to determine substrate type. A six-inch by six-inch stainless-steel Ekman dredge was also used to verify substrate type. Representative photographs were taken of each substrate type observed and are provided in Appendix C.

Upon completion of the substrate characterization, the recorded transect grid data was used to delineate boundaries of the aquatic resources located within the Project study area. Section 2.3 and 2.4 below detail the substrate types observed within the Project study area, while Section 3.0 describes the survey results.

2.2 Substrate Characterization

Substrate was determined using the procedures in Section 2.1 and characterized using select categories and descriptions provided in Table 2-1.

Table 2-1
Substrate Type Categories

Symbol	Categories	Description
S	Soft Mud	Soft, slushy mud that would not support small pieces of cultch material (stones, shells, and grit that form the base of an oyster bed)
M	Moderately Firm Mud or Sand	Bottom that would support small pieces of cultch material
F	Firm Sand or Mud	Compact muddy or sandy substrate
G	Seagrass	Presence of seagrass bed
I Is la	Intertidal Marsh <i>Spartina alterniflora</i> <i>Avicennia germinans</i>	Presence of intertidal marsh
H	Shell Hash ¹	Loose shell (broken or whole) accumulations with a median particle size of 2 millimeters to < 64 millimeters ¹
CO	Consolidated Oyster Reef	Thick shell
SO	Scattered Oyster Shell	Single or scattered shells
BO	Buried Oyster Shell Under Sediment	Shells buried under sediment
R	Rip-rap/Concrete/Rubble	Rock, concrete, or other non-organic material placed to stabilize shoreline
T	Trash-Debris	Non-organic debris
W	Woody-Debris	Organic, woody debris
X	Other	Anything that does not fit into any of the previous categories

Notes:

¹ Source: USGS, 2017

2.3 Seagrass Resources

Seagrass resources observed within the transect grid were identified to the species level and first assessed using the Braun-Blanquet (1972) rapid visual assessment technique (see Table 2-2) at a randomly placed one-meter square plot. The Braun-Blanquet method provides a quick rating system for seagrass beds through estimation of the vegetation's percent areal cover.

Seagrass beds were further assessed to estimate the number of stems per bed. A random sample was taken using the six-inch by six-inch Ekman dredge within the one-meter square plot. The number of samples taken per bed was determined in the field according to the size of each seagrass bed. The number of stems counted per sample taken was used to calculate the average stem count per square foot, from which the total stem count was extrapolated for the seagrass bed area.

Table 2-2
Braun-Blanquet Seagrass Presence Ratings

Score	Visual Indication
0	Species absent from quadrant
0.1	Species represented by a solitary short shoot, <5% cover
0.5	Species represented by a few (<5%) short shoots, <5% cover
1	Species represented by many (>5%) short shoots, <5% cover
2	Species represented by many (>5%) short shoots, 5%-25% cover
3	Species represented by many (>5) short shoots, 25%-50% cover
4	Species represented by many (>5) short shoots, 50%-75% cover
5	Species represented by many (>5%) short shoots, 75%-100% cover

2.4 Oyster Resources

As mentioned above in Section 2.1, to identify the presence or absence of oyster resources substrate observations were recorded at 50-foot intersections of the transect grid. Substrate types were characterized by sight, feel, or the use of the eight-foot aluminum sounding pole. The Ekman dredge was also used to verify substrate type. If consolidated oyster beds were visually observed outside of the 50-foot transect sample points, the resource was mapped.

2.5 Intertidal Marsh Resources

If intertidal marsh resources were located at the 50-foot intersections of the transect grid, the resource type was recorded. Marsh types are characterized by sight, and if they were visually observed outside of the 50-foot transect sample points, the resource was mapped.

Table 2-3
Intertidal Marsh Cowardin Classifications

Cowardin Code	Description/Type
E2EM	Estuarine, Intertidal, Emergent (i.e., <i>Spartina alterniflora</i>)
E2SS	Estuarine, Intertidal, Scrub-Shrub (i.e., <i>Avicennia germinans</i>)
E2US	Estuarine, Intertidal, Unconsolidated Shore (i.e., sandflat, mudflat)

3.0 Observations and Results

Transect grid data sheets collected within the Project study area are provided in Appendix B. Substrates, aquatic resources, and oyster beds observed in the Project area are shown in Tables 3-2 to 3-9, and Attachment A - Figures 3a to 3d. Appendix C contains representative photos of the substrates and aquatic resources sampled as wells as images of E2EM, E2SS, and E2US habitats found within the Project area.

LEI identified multiple substrates and aquatic resources within the Project study area including: soft, moderately firm, and firm mud or sand; shell hash; scattered oysters; consolidated oyster bed; seagrass; intertidal marsh (emergent and scrub-shrub); rubble and riprap; woody, organic, and other debris; and algae.

LEI ecologists mapped 24 seagrass beds containing shoal grass (*Halodule wrightii*). Stem counts were conducted for each Ekman sample grab (a 0.25 square foot sample) at seagrass beds when possible. At the ecologists' discretion, more than one Ekman sample grab may have been recorded to obtain an average of stems across the bed, particularly at larger seagrass beds.

Seventeen E2EM habitats were recorded. Dominated vegetation included *Spartina alterniflora*; *Batis maritima*, *Distichlis littoralis*, *Distichlis spicata*, and *Salicornia* species were also observed. Thirteen E2SS habitats were recorded. *Avicennia germinans* was the dominant scrub/shrub species present. E2US mud and/or sandflats were present at nearly all shorelines and were mapped when within the Project area.

3.1 Sampling Conditions

Field surveys were conducted in February and March 2019. Weather conditions observed during surveys are presented in Table 3-1. Conditions were typically cloudy and foggy with low visibility. Air temperatures ranged from 37 to 71 degrees Fahrenheit (°F) and water temperatures ranged from 58 to 62°F.

Table 3-1
Weather Conditions During Surveys

Date	Observed Conditions	Air Temperature (L=Low, H=High)	Wind Speed/ Direction	Water Levels (Mean Lower Low Water) (L=Low tide, H=High tide)	Water Temperature
2/20/2019	Clear	L 46°F H 68°F	10-17 mph/ Northeast	H 2.23' @ 7:12am L 0.5' @ 3:54pm	58°F
2/21/2019	Cloudy	L 57°F H 60°F	7-14 mph/ Northeast	H 1.8' @ 10:24am L 1.03' @ 3:48pm H 1.84' @ 10:12pm	59°F
2/26/2019	Cloudy/ Foggy	L 61°F H 71°F	5-13 mph/ Southeast	H 1.69' @ 12:12am L 1.12' @ 8:36am H 2.07' @ 7:06pm	61°F
3/1/2019	Cloudy/ Foggy	L 49.5°F H 55°F	5-16 mph/ Northeast	H 1.7' @ 1:54am L 0.62' @ 11:18am H 1.76' @ 10:24pm	62°F
Date	Observed Conditions	Air Temperature (L=Low, H=High)	Wind Speed/ Direction	Water Levels (Mean Lower Low Water)	Water Temperature

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				(L=Low tide, H=High tide)	
3/2/2019	Cloudy/ Foggy	L 61°F H 63°F	3-15 mph/ Northeast	H 1.69' @ 12:06am L 0.6' @ 11:48am H 1.56' @ 10:24pm	62°F
3/3/2019	Cloudy/ Foggy	L 57°F H 67°F	2-23 mph/ Southeast to Northeast	H 1.54' @ 12:36am L 0.64' @ 2:18pm H 1.63' @ 8:06pm	62°F
3/4/2019	Cloudy/ Foggy	L 37°F H 44°F	16-27 mph, Northeast	H 1.68' @ 3:18am L 0.58' @ 1:18pm H 1.46' @ 9:42pm	60°F
3/8/2019	Cloudy/ Foggy	L 65.5°F H 67.5°F	3-16 mph, Southeast to Southwest	H 1.49' @ 8:54am L 1' @ 4:36pm 1.48' @ 9:30pm	58°F

Source: National Weather Service and NOAA

3.3 Survey Results

The following section includes the survey results for Study Area A, B, C, and D.

3.3.1 Study Area A

Table 3-2 presents the total area of resources found in Study Area A. Table 3-3 presents the seagrass stem counts observed in Study Area A and an estimated total stem count per seagrass bed that was observed in Study Area A. Refer to Appendix A, Figure 2a for a depiction of Study Area A and Figure 3a for a map of resources and substrates identified in Study Area A.

Table 3-2
Resources and Substrates in Study Area A

Resource	Sq. Ft.	Acres
Deep Water, 8ft+	1,668,419.16	38.30
Firm, Moderately Firm, or Soft/Mud/Sand	790,975.63	18.16
Inland	724,971.05	16.64
Intertidal Marsh	211,771.86	4.86
Scattered Oyster Shell	5,532.28	0.13
Seagrass	664,524.14	15.26
Shell Hash	43,608.34	1.0
Total	4,109,802.46	94.35¹

Notes:

¹ As multiple resources can be located within the same area (i.e., seagrass, shell hash, soft mud/sand) resource acreage totals exceed survey area boundary.

Table 3-3
Seagrass and Stem Counts in Study Area A

Bed # ¹	Mapped Area (sq.ft.)	Seagrass Species	Seagrass Presence Rating	Ekman Grab #	Stem Count (0.25 sq.ft.)	Average Stem Count per 1 sq.ft.	Extrapolated Total Stem Count per Bed	Notes
D-SB24	61,234	<i>Halodule wrightii</i>	2	SB24_01	135	540	33,066,360	Scattered oyster reef present
			(5-25% cover)					
D-SB25	86,103	<i>Halodule wrightii</i>	2	SB25_01	110	440	37,885,320	Scattered oyster reef present
			(5-25% cover)					
D-SB26	258,855	<i>Halodule wrightii</i>	3	SB26_01	86	344	89,046,120	—
			(25-50% cover)					
D-SB27	12,349	<i>Halodule wrightii</i>	3	SB27_01	91	364	4,495,036	—
			(25-50% cover)					
D-SB28	46,553	<i>Halodule wrightii</i>	3	SB28_01	45	180	8,379,540	—
			(25-50% cover)					
D-SB29	27,438	<i>Halodule wrightii</i>	2	SB29_01	15	60	1,646,280	—
			(5-25% cover)					
J-SB30	18,638	<i>Halodule wrightii</i>	2	SB29_01	83	332	6,187,816	—
			(5-25% cover)					
Total	511,170	—	—	—	—	322²	180,706,472	—

Notes:

¹ Feature IDs consist of field lead/observer's first initial and feature number

² Average stem count.

3.3.2 Study Area B

Table 3-4 presents the total area of resources found in Study Area B. Table 3-5 presents the seagrass stem counts observed in Study Area B and an estimated total stem count per seagrass bed that was observed in Study Area B. Refer to Appendix A, Figure 2b for a depiction of Study Area B and Figure 3b for a map of resources and substrates identified in Study Area B.

Table 3-4
Resources and Substrates in Study Area B

Resource	Sq. Ft.	Acres
Algae Bed	8,160.46	0.19
Deep Water, 8ft+	1,411,746.79	32.41
Firm, Moderately Firm, or Soft/Mud/Sand	1,971,172.22	45.25
Inland	137,031.66	3.15
Intertidal Marsh	438,934.31	10.08
Scattered Oyster Shell	476.64	0.01
Seagrass	358,011.64	8.22
Shell Hash	95,483.33	2.19
Oyster Bed	478	0.01
Total	4,421,495.05	101.51¹

Notes:

¹ As multiple resources can be located within the same area (i.e., seagrass, shell hash, soft mud/sand) resource acreage totals exceed survey area boundary.

Table 3-5
Seagrass and Stem Counts in Study Area B

Bed # ¹	Mapped Area (sq.ft.)	Seagrass Species	Seagrass Presence Rating	Ekman Grab #	Stem Count (0.25 sq.ft.)	Average Stem Count per 1 sq.ft.	Extrapolated Total Stem Count per Bed	Notes
J-SB14	15,758	<i>Halodule wrightii</i>	3 (25-50% cover)	SB14_01	107	372	5,861,976	—
J-SB15	128,339	<i>Halodule wrightii</i>	3 (25-50% cover)	SB15_01	96	410	52,618,990	—
D-SB17	17,843	<i>Halodule wrightii</i>	2 (5-25% cover)	SB17_01	67	268	4,781,924	—
D-SB18	52,516	<i>Halodule wrightii</i>	2 (5-25% cover)	SB18_01	75	300	15,754,800	—
D-SB19	10,082	<i>Halodule wrightii</i>	3 (25-50% cover)	SB19_01	92	368	3,710,176	—
D-SB20	32,275	<i>Halodule wrightii</i>	3 (25-50% cover)	SB20_01	115	460	14,846,500	—
D-SB21	67,825	<i>Halodule wrightii</i>	3 (25-50% cover)	SB21_01	110	440	29,843,000	—
D-SB22	9,310	<i>Halodule wrightii</i>	2 (5-25% cover)	SB22_01	50	200	1,862,000	—
D-SB23	30,528	<i>Halodule wrightii</i>	2 (5-25% cover)	SB23_01	88	352	10,745,856	—
Total	364,476	—	—	—	—	352²	140,025,222	—

Notes:

¹ Feature IDs consist of field lead/observer's first initial and feature number

² Average stem count.

3.3.3 Study Area C

Table 3-6 presents the total area of resources found in Study Area C. Table 3-7 presents the seagrass stem counts observed in Study Area C and an estimated total stem count per seagrass bed that was observed in Study Area C. Refer to Appendix A, Figure 2c for a depiction of Study Area C and Figure 3c for a map of resources and substrates identified in Study Area C.

Table 3-6
Resources and Substrates in Study Area C

Resource	Sq. Ft.	Acres
Deep Water, 8ft+	317,201.85	7.28
Firm, Moderately Firm, or Soft/Mud/Sand	486,114.14	11.16
Inland	17,994.84	0.41
Intertidal Marsh	137,568.44	3.16
Scattered Oyster Shell	33,926.61	0.77
Seagrass	141,068.66	3.24
Shell Hash	116,511.99	2.67
Oyster Bed	17,848	0.41
Total	1,268,234.53	29.10¹

Notes:

¹ As multiple resources can be located within the same area (i.e., seagrass, shell hash, soft mud/sand) resource acreage totals exceed survey area boundary.

Table 3-7
Seagrass and Stem Counts in Study Area C

Bed # ¹	Mapped Area (sq.ft.)	Seagrass Species	Seagrass Presence Rating	Ekman Grab #	Stem Count (0.25 sq.ft.)	Average Stem Count per 1 sq.ft.	Extrapolated Total Stem Count per Bed	Notes
T-SB04	13,413	<i>Halodule wrightii</i>	4 (50-75% cover)	SB04_01	270	1,080	14,486,040	—
T-SB05	75,338	<i>Halodule wrightii</i>	2 (5-25% cover)	SB05_01 SB05_02	97 173	540	40,682,520	—
T-SB06	2,474	<i>Halodule wrightii</i>	3 (25-50% cover)	SB06_01	238	952	2,355,248	—
J-SB07	12,167	<i>Halodule wrightii</i>	3 (25-50% cover)	SB07_01	139	556	6,764,852	—
T-SB08	16,448	<i>Halodule wrightii</i>	2 (5-25% cover)	SB08_01 SB08_02	126 176	604	9,934,592	—
J-SB09	10,748	<i>Halodule wrightii</i>	3 (25-50% cover)	SB09_01	167	668	7,179,664	—
T-SB10	558	<i>Halodule wrightii</i>	3 (25-50% cover)	SB10_01	180	720	401,760	—
J-SB11	5,060	<i>Halodule wrightii</i>	3 (25-50% cover)	SB11_01	100	400	2,024,000	—
J-SB12	26,530	<i>Halodule wrightii</i>	3 (25-50% cover)	SB12_01	122	488	12,946,640	—
J-SB13	13,508	<i>Halodule wrightii</i>	3 (25-50% cover)	SB13_01	158	632	8,537,056	—
J-SB16	3,213	<i>Halodule wrightii</i>	3 (25-50% cover)	SB16_01	105	420	1,349,460	—
Total	179,457	—	—	—	—	642 ²	106,661,832	—

Notes:

¹ Feature IDs consist of field lead/observer's first initial and feature number

² Average stem count.

3.3.4 Study Area D

Table 3-8 presents the total area of resources found in Study Area D. Table 3-9 presents the seagrass stem counts observed in Study Area D and an estimated total stem count per seagrass bed that was observed in Study Area D. Refer to Appendix A, Figure 2d for a depiction of Study Area D and Figure 3d for a map of resources and substrates identified in Study Area D.

Table 3-8
Resources and Substrates in Study Area D

Resource	Sq. Ft.	Acres
Deep Water, 8ft+	2,791,739.23	64.09
Firm, Moderately Firm, or Soft/Mud/Sand	590,050.40	13.55
Inland	0	0
Intertidal Marsh	4,559.84	0.10
Scattered Oyster Shell	0	0
Seagrass	34,448.78	0.79
Shell Hash	228,092.83	5.24
Total	3,648,891.08	83.77¹

Notes:

¹ As multiple resources can be located within the same area (i.e., seagrass, shell hash, soft mud/sand) resource acreage totals exceed survey area boundary.

Table 3-9
Seagrass and Stem Counts in Study Area D

Bed # ¹	Mapped Area (sq.ft.)	Seagrass Species	Seagrass Presence Rating	Ekman Grab #	Stem Count (0.25 sq.ft.)	Average Stem Count per 1 sq.ft.	Extrapolated Total Stem Count per Bed	Notes
T-SB01	2,886	<i>Halodule wrightii</i>	0.1	SB01_01	N/A	N/A	N/A	Living roots, but no stem growth observed at this time
			(0% cover)					
T-SB02	6.6	<i>Halodule wrightii</i>	0.1	SB02_01	N/A	N/A	N/A	Living roots, but no stem growth observed at this time
			(0% cover)					
T-SB03	30,058	<i>Halodule wrightii</i>	2	SB03_01	47	522	15,690,276	—
			(5-25% cover)	SB03_02	214			
Total	32,951	—	—	—	—	522 ²	15,690,276	—

Notes:

¹ Feature IDs consist of field lead/observer's first initial and feature number

² Average stem count.

3.3.6 Summary

Table 3-10 presents a summary of findings from the aquatic resources survey for all study areas

Table 3-10
 Seagrass and Stem Counts in all Study Areas

Bed # ¹	Mapped Area (sq.ft.)	Seagrass Species	Seagrass Presence Rating	Ekman Grab #	Stem Count (0.25 sq.ft.)	Average Stem Count per 1 sq.ft.	Extrapolated Total Stem Count per Bed	Notes
D-SB24	61,234	<i>Halodule wrightii</i>	2	SB24_01	135	540	33,066,360	Scattered oyster reef present
			(5-25% cover)					
D-SB25	86,103	<i>Halodule wrightii</i>	2	SB25_01	110	440	37,885,320	Scattered oyster reef present
			(5-25% cover)					
D-SB26	258,855	<i>Halodule wrightii</i>	3	SB26_01	86	344	89,046,120	—
			(25-50% cover)					
D-SB27	12,349	<i>Halodule wrightii</i>	3	SB27_01	91	364	4,495,036	—
			(25-50% cover)					
D-SB28	46,553	<i>Halodule wrightii</i>	3	SB28_01	45	180	8,379,540	—
			(25-50% cover)					
D-SB29	27,438	<i>Halodule wrightii</i>	2	SB29_01	15	60	1,646,280	—
			(5-25% cover)					
J-SB30	18,638	<i>Halodule wrightii</i>	2	SB29_01	83	332	6,187,816	—
			(5-25% cover)					
J-SB14	15,758	<i>Halodule wrightii</i>	3	SB14_01	107	372	5,861,976	—
			(25-50% cover)					
J-SB15	128,339	<i>Halodule wrightii</i>	3	SB15_01	96	410	52,618,990	—
			(25-50% cover)					
D-SB17	17,843	<i>Halodule wrightii</i>	2	SB17_01	67	268	4,781,924	—
			(5-25% cover)					
D-SB18	52,516	<i>Halodule wrightii</i>	2	SB18_01	75	300	15,754,800	—
			(5-25% cover)					
D-SB19	10,082	<i>Halodule wrightii</i>	3	SB19_01	92	368	3,710,176	—
			(25-50% cover)					
D-SB20	32,275	<i>Halodule wrightii</i>	3	SB20_01	115	460	14,846,500	—
			(25-50% cover)					
D-SB21	67,825	<i>Halodule wrightii</i>	3	SB21_01	110	440	29,843,000	—
			(25-50% cover)					
D-SB22	9,310	<i>Halodule wrightii</i>	2	SB22_01	50	200	1,862,000	—
			(5-25% cover)					
D-SB23	30,528	<i>Halodule wrightii</i>	2	SB23_01	88	352	10,745,856	—
			(5-25% cover)					
T-SB04	13,413	<i>Halodule wrightii</i>	4	SB04_01	270	1,080	14,486,040	—
			(50-75% cover)					
T-SB05	75,338	<i>Halodule wrightii</i>	2	SB05_01	97	540	40,682,520	—
			(5-25% cover)	SB05_02	173			
T-SB06	2,474		3	SB06_01	238	952	2,355,248	

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 Bluewater SPM Project

		<i>Halodule wrightii</i>	(25-50% cover)					—
J-SB07	12,167	<i>Halodule wrightii</i>	3	SB07_01	139	556	6,764,852	—
			(25-50% cover)					
T-SB08	16,448	<i>Halodule wrightii</i>	2	SB08_01	126	604	9,934,592	—
			(5-25% cover)	SB08_02	176			
J-SB09	10,748	<i>Halodule wrightii</i>	3	SB09_01	167	668	7,179,664	—
			(25-50% cover)					
T-SB10	558	<i>Halodule wrightii</i>	3	SB10_01	180	720	401,760	—
			(25-50% cover)					
J-SB11	5,060	<i>Halodule wrightii</i>	3	SB11_01	100	400	2,024,000	—
			(25-50% cover)					
J-SB12	26,530	<i>Halodule wrightii</i>	3	SB12_01	122	488	12,946,640	—
			(25-50% cover)					
J-SB13	13,508	<i>Halodule wrightii</i>	3	SB13_01	158	632	8,537,056	—
			(25-50% cover)					
J-SB16	3,213	<i>Halodule wrightii</i>	3	SB16_01	105	420	1,349,460	—
			(25-50% cover)					
T-SB01	2,886	<i>Halodule wrightii</i>	0.1	SB01_01	N/A	N/A	N/A	Living roots, but no stem growth observed at this time
			(0% cover)					
T-SB02	6.6	<i>Halodule wrightii</i>	0.1	SB02_01	N/A	N/A	N/A	Living roots, but no stem growth observed at this time
			(0% cover)					
T-SB03	30,058	<i>Halodule wrightii</i>	2	SB03_01	47	522	15,690,276	—
			(5-25% cover)	SB03_02	214			
Total	1,088,054	—	—	—	—	—	443,083,802	—

4.0 Conclusions

LEI conducted field investigations in February and March 2019 on behalf of BWTT. The primary substrates within the Project study areas included firm and moderately firm sand or mud and shell hash. Seagrass resources totaled 1,088,144 square feet, and consolidated oyster bed resources totaled 0.42 acre within the Project study areas. *Spartina alterniflora* dominant E2EM marshes and *Avicennia germinans* dominant E2SS marshes were frequently observed and are noticeably visible on aerial imagery. Remaining habitats include E2US sand/mudflats and deep water (greater than 8-feet-deep).

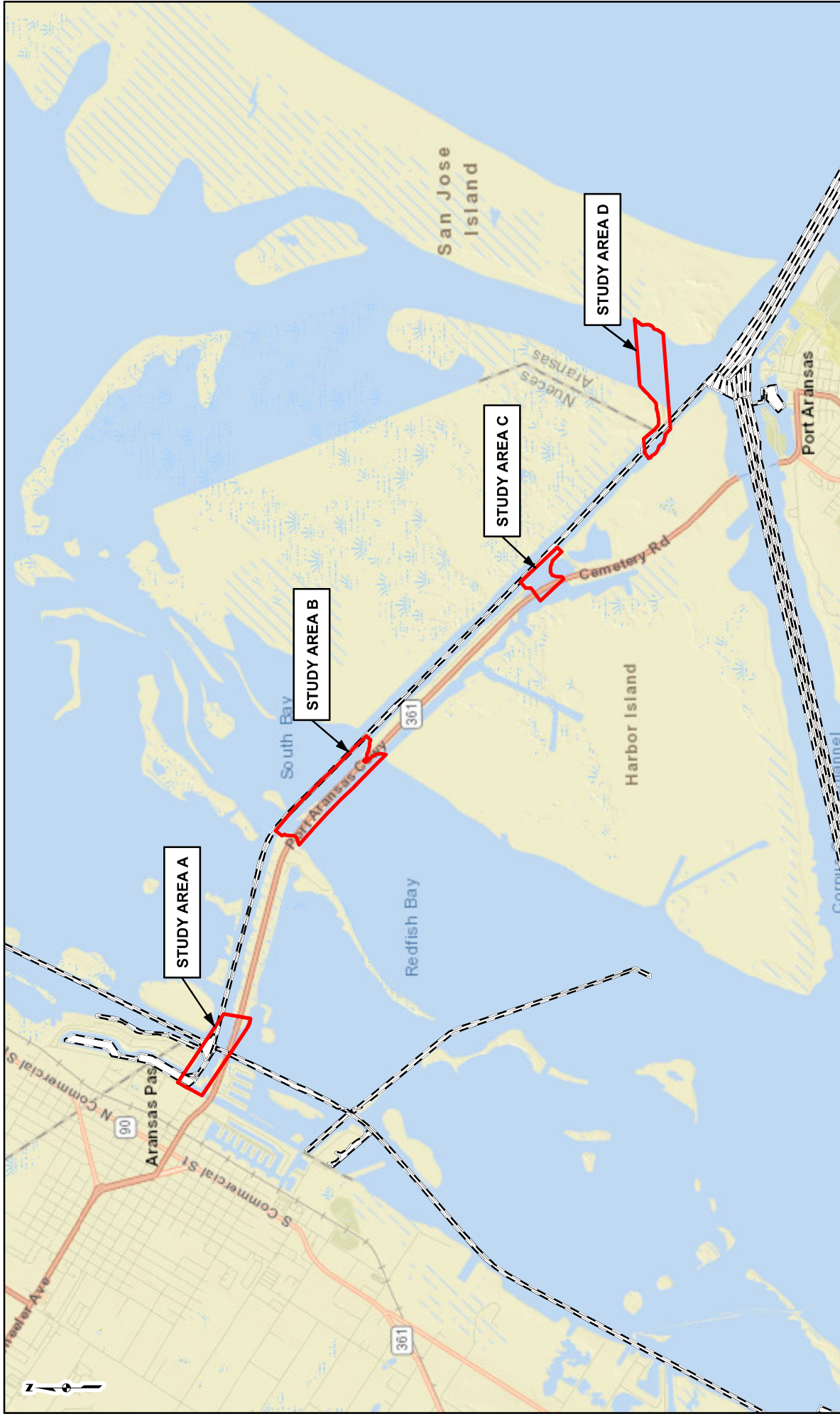
5.0 References

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- U.S. Geological Survey. 2019. Port Aransas Quadrangle, Texas, 7.5-minute Series Topographic Map.

Appendix A

Figures



**FIGURE 1
VICINITY MAP**

LLOYD
ENGINEERING, INC.

BLUEWATER SPM PROJECT
NUECES AND ARANSAS
COUNTY, TEXAS

DRAWN BY: DAF DATE: 4/9/2019
CHECKED: JRM/TMA APPROVED: JW

LEGEND
 Study Area



REFERENCE:
WORLD STREETMAP, OBTAINED
THROUGH ESRI/ARCGIS ONLINE,
© 2012 ESRI, DeLORME, NAVTEQ,
TOMTOM, ACCESSED 04/2019.

PROJECT LOCATION





FIGURE 2a
STUDY AREA A FIFTY-FOOT POINT
INTERCEPT SURVEY GRID

LLOYD
 ENGINEERING, INC.

BLUEWATER SPM PROJECT
NUECES & ARANSAS COUNTIES
TEXAS

DRAWN BY: EAE/DAF DATE: 4/9/2019
 CHECKED: JRM/TMA APPROVED:

LEGEND

 Study Area  Survey Grid

0 0.075 0.15 0.3 Miles

REFERENCE:
 WORLD STREETMAP, OBTAINED THROUGH ESRI/ARCGIS ONLINE, © 2012 ESRI, DeLORME, NAVTEQ, TOMTOM, ACCESSED 04/2019.

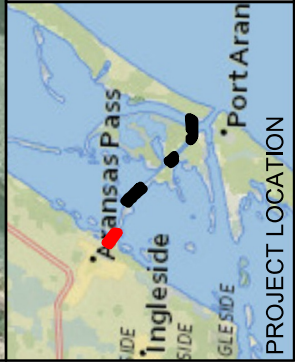




FIGURE 2b
STUDY AREA B FIFTY-FOOT POINT
INTERCEPT SURVEY GRID

LLOYD
 ENGINEERING, INC.
 BLUEWATER SPM PROJECT
 NUECES & ARANSAS COUNTIES
 TEXAS

DRAWN BY: EAE/DAF DATE: 4/9/2019
 CHECKED: JRM/TMA APPROVED:

LEGEND

Study Area Survey Grid

0 0.075 0.15 0.3 Miles

REFERENCE:
 WORLD STREETMAP, OBTAINED
 THROUGH ESRI/ARCGIS ONLINE,
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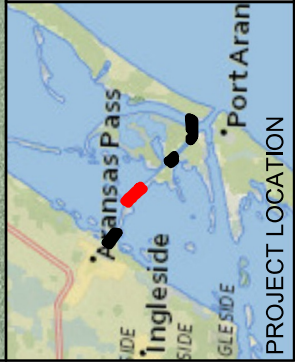






FIGURE 2c
STUDY AREA C FIFTY-FOOT POINT
INTERCEPT SURVEY GRID

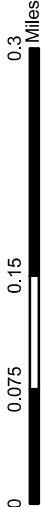
LLOYD
 ENGINEERING, INC.
 BLUEWATER SPM PROJECT
 NUECES & ARANSAS COUNTIES
 TEXAS

DRAWN BY: EAE/DAF DATE: 4/9/2019
 CHECKED: JRM/TMA APPROVED:

LEGEND

 Study Area  Survey Grid

0 0.075 0.15 0.3 Miles



REFERENCE:
 WORLD STREETMAP, OBTAINED
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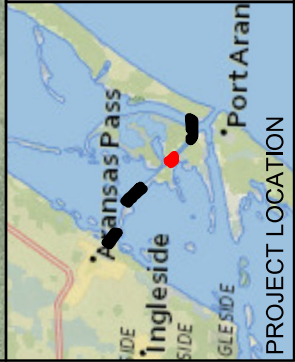




FIGURE 2d
STUDY AREA D FIFTY-FOOT POINT
INTERCEPT SURVEY GRID

Lloyd
 ENGINEERING, INC.

BLUEWATER SPM PROJECT
 NUECES & ARANSAS COUNTIES
 TEXAS

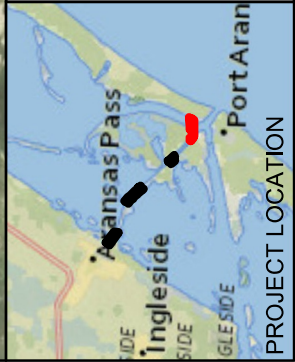
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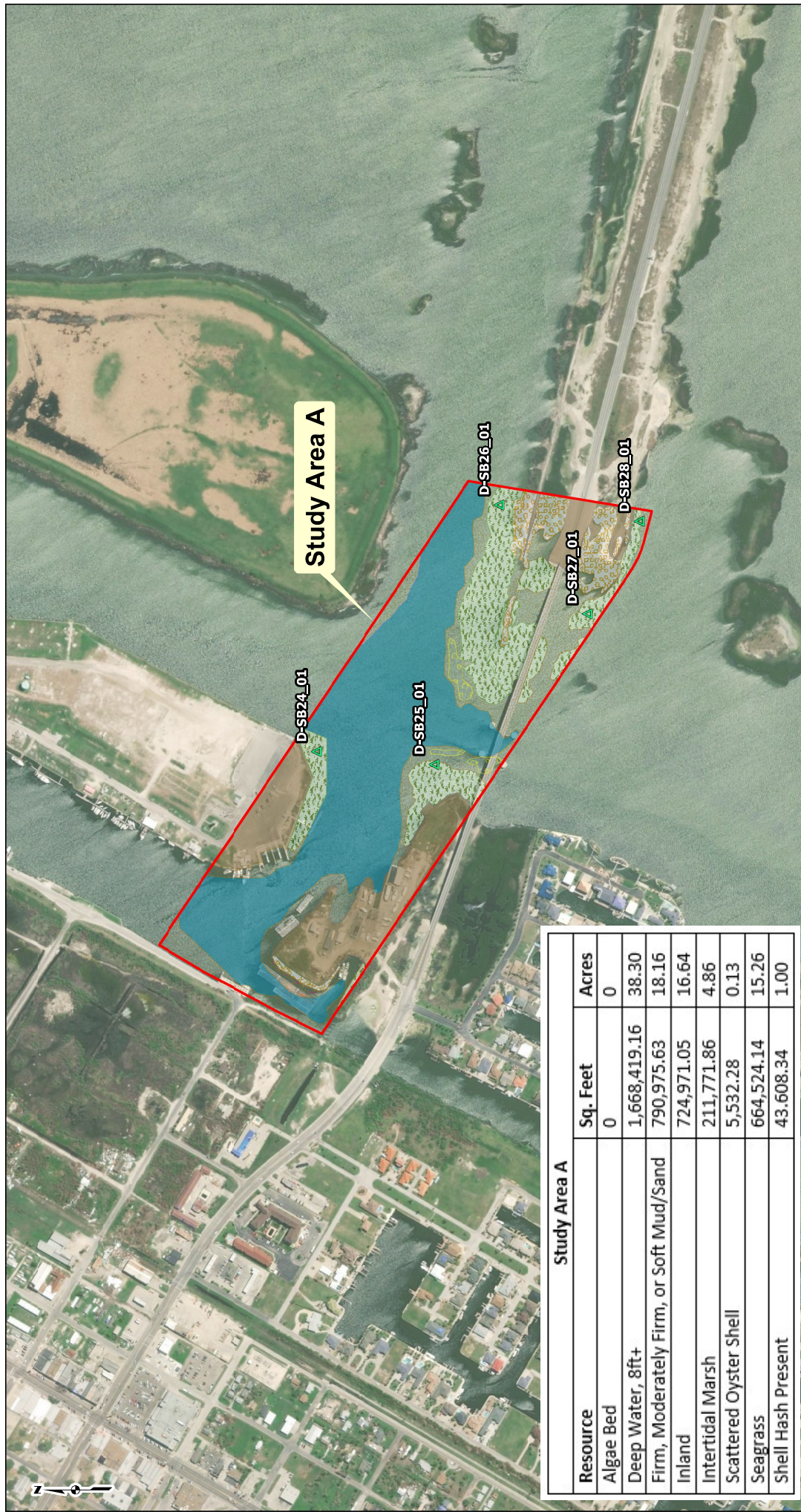
LEGEND

Study Area Survey Grid

0 0.075 0.15 0.3 Miles

REFERENCE:
 WORLD STREETMAP, OBTAINED
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Study Area A

Study Area A		
Resource	Sq. Feet	Acres
Algae Bed	0	0
Deep Water, 8ft+	1,668,419.16	38.30
Firm, Moderately Firm, or Soft Mud/Sand	790,975.63	18.16
Inland	724,971.05	16.64
Intertidal Marsh	211,771.86	4.86
Scattered Oyster Shell	5,532.28	0.13
Seagrass	664,524.14	15.26
Shell Hash Present	43,608.34	1.00

FIGURE 3a
Study Area A
Substrate Characterization Map

LLOYD ENGINEERING, INC.
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CHECKED: JRM/TMA
DATE: 4/10/2019
APPROVED:

BLUEWATER SPM PROJECT
NUECES & ARANSAS COUNTIES
TEXAS

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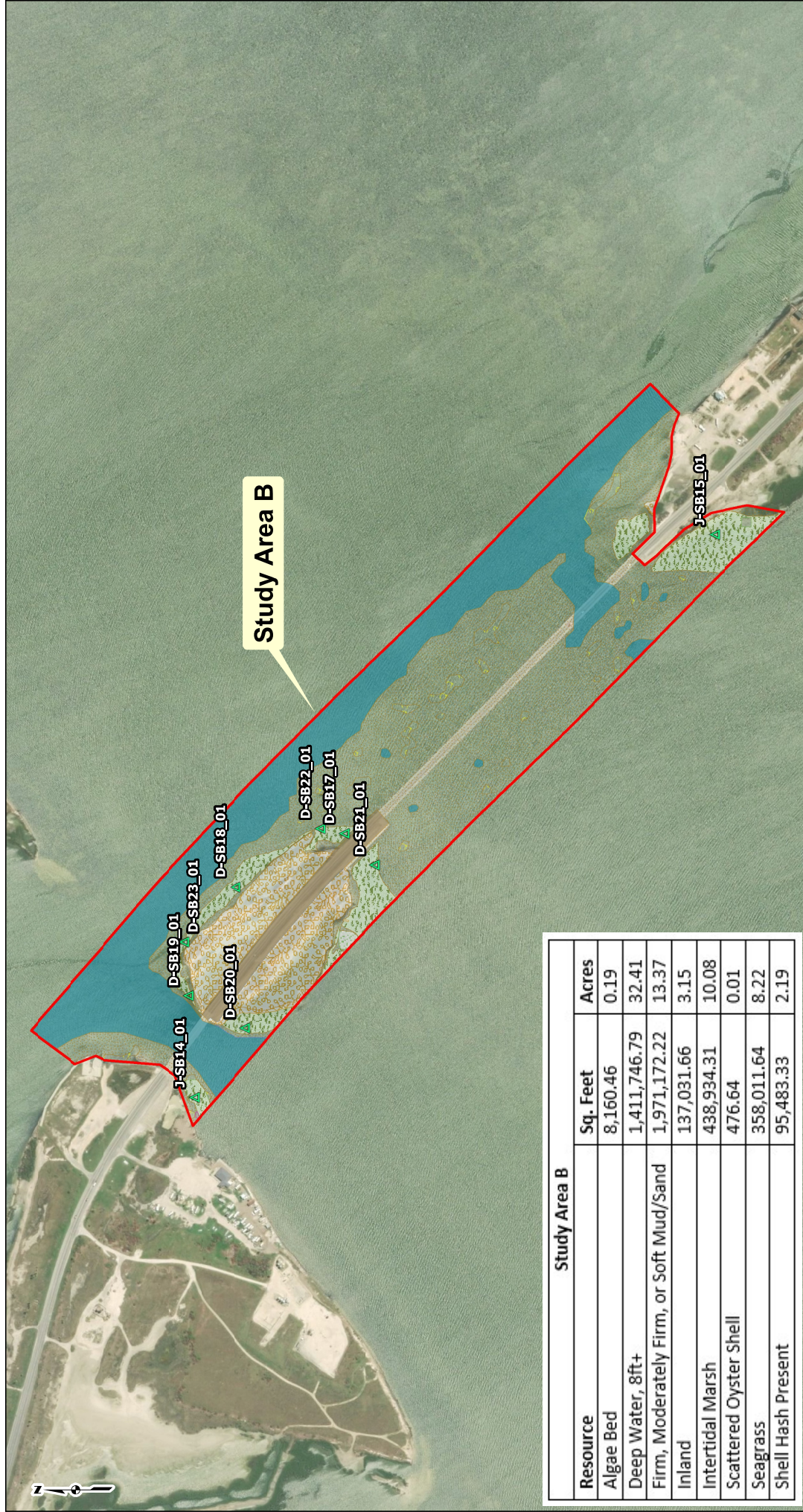
LEGEND

- Sample Plot/Ekman
- Study Area
- Deep Water, 8ft+
- Firm, Moderately Firm, or Soft Mud/Sand
- Inland
- Intertidal Marsh
- Scattered Oyster Shell
- Seagrass
- Shell Hash Present

0 500 1,000 2,000 Feet

REFERENCE:
WORLD STREETMAP, OBTAINED THROUGH ESRI ARCGIS ONLINE. © 2012 ESRI, DeLORME, NAVTEQ, TOMTOM, ACCESSED 04/2019.





Study Area B		
Resource	Sq. Feet	Acres
Algae Bed	8,160.46	0.19
Deep Water, 8ft+	1,411,746.79	32.41
Firm, Moderately Firm, or Soft Mud/Sand	1,971,172.22	13.37
Inland	137,031.66	3.15
Intertidal Marsh	438,934.31	10.08
Scattered Oyster Shell	476.64	0.01
Seagrass	358,011.64	8.22
Shell Hash Present	95,483.33	2.19

FIGURE 3b
Study Area B
Substrate Characterization Map

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ENGINEERING, INC.

BLUEWATER SPM PROJECT
NUECES & ARANSAS COUNTIES
TEXAS

DRAWN BY: DAF
CHECKED: JRM/TMA
DATE: 4/10/2019
APPROVED:

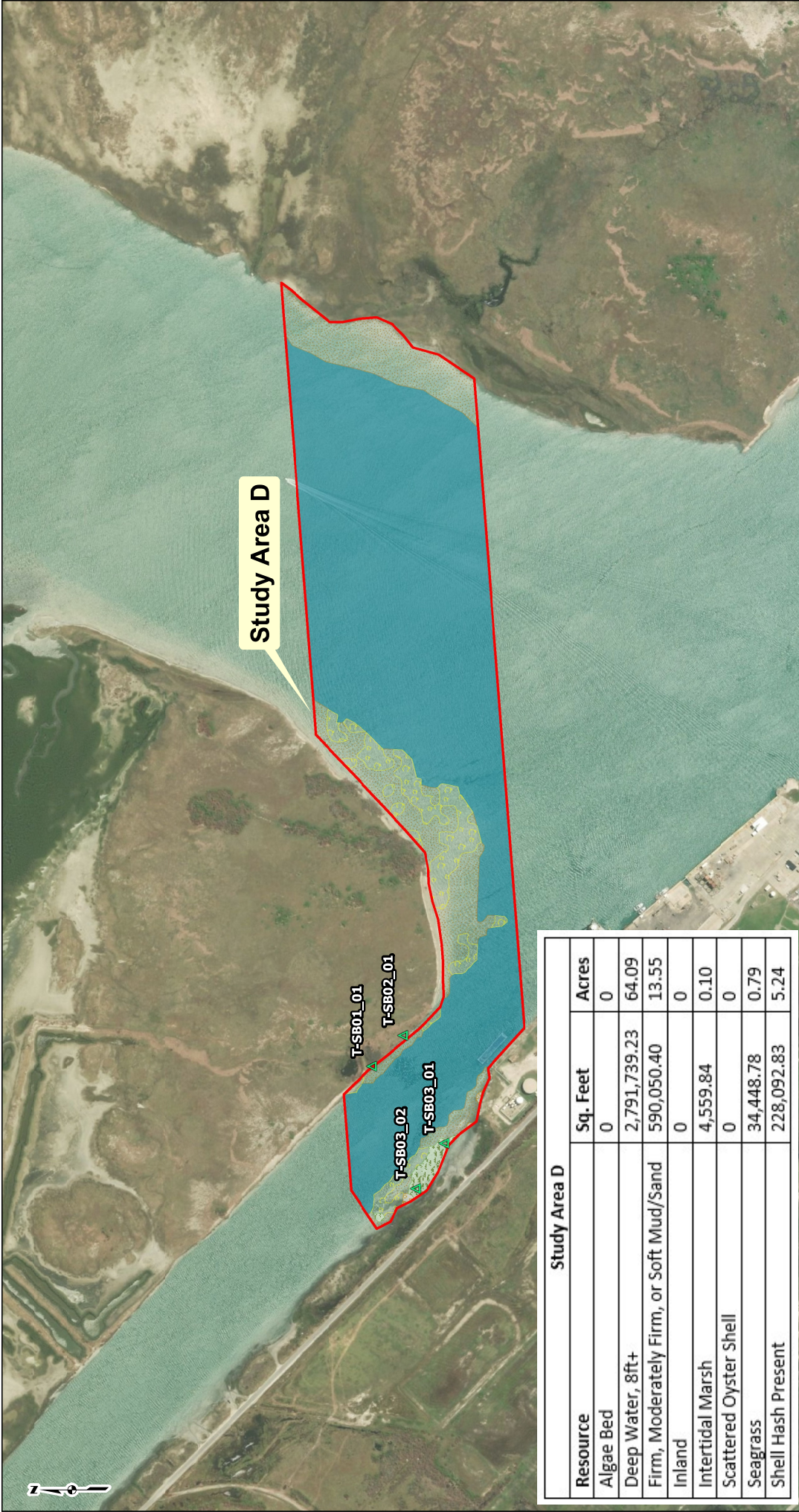
LEGEND

- Sample Plot/Ekman
- Study Area
- Algae Bed
- Deep Water, 8ft+
- Firm, Moderately Firm, or Soft Mud/Sand
- Inland
- Intertidal Marsh
- Scattered Oyster Shell
- Seagrass
- Shell Hash Present
- Steel Pipe

0 500 1,000 2,000 Feet

REFERENCE:
WORLD STREETMAP, OBTAINED
THROUGH ESRI ARCGIS ONLINE,
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TOMTOM, ACCESSED 04/2019.





Study Area D

Resource	Sq. Feet	Acres
Algae Bed	0	0
Deep Water, 8ft+	2,791,739.23	64.09
Firm, Moderately Firm, or Soft Mud/Sand	590,050.40	13.55
Inland	0	0
Intertidal Marsh	4,559.84	0.10
Scattered Oyster Shell	0	0
Seagrass	34,448.78	0.79
Shell Hash Present	228,092.83	5.24

FIGURE 3d
Study Area D
Substrate Characterization Map

HOYD
ENGINEERING, INC.

BLUEWATER SPM PROJECT
NUECES & ARANAS COUNTIES
TEXAS

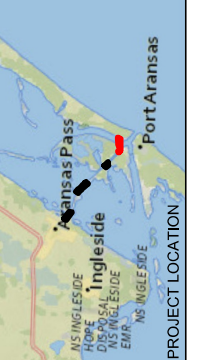
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DRAWN BY: DAF
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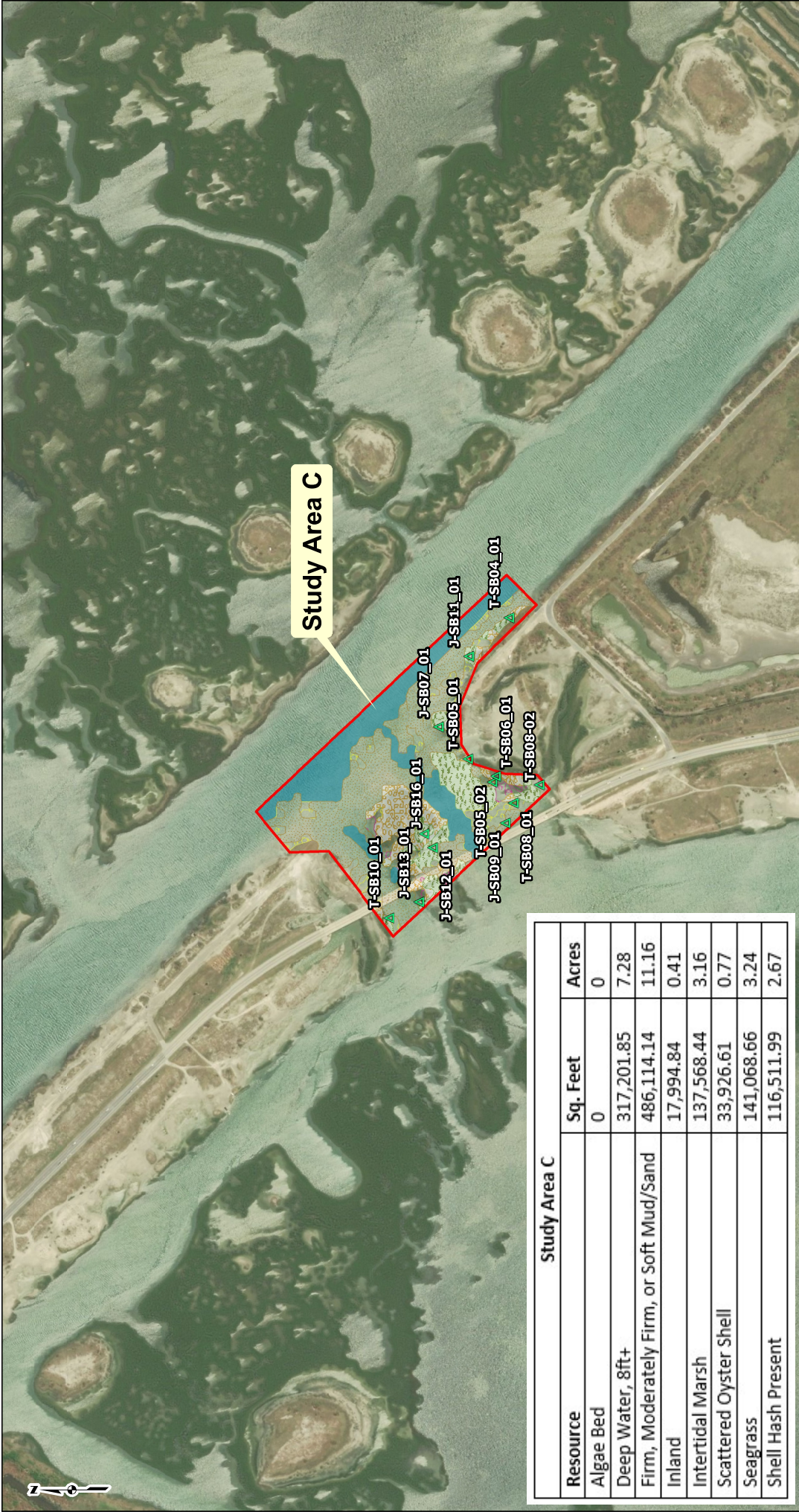
LEGEND

- ▲ Sample Plots/Ekman
- Study_Area_2
- Deep Water, 8ft+
- FIRM, MOD FIRM, SOFT MUD/SAND
- Intertidal Marsh
- Seagrass
- Shell Hash Presence

0 500 1,000 2,000 Feet

REFERENCE:
WORLD STREETMAP, OBTAINED THROUGH ESRI ARCGIS ONLINE. © 2012 ESRI, DeLORME, NAVTEQ, TOMTOM, ACCESSED 04/2019.





Study Area C

Study Area C		
Resource	Sq. Feet	Acres
Algae Bed	0	0
Deep Water, 8ft+	317,201.85	7.28
Firm, Moderately Firm, or Soft Mud/Sand	486,114.14	11.16
Inland	17,994.84	0.41
Intertidal Marsh	137,568.44	3.16
Scattered Oyster Shell	33,926.61	0.77
Seagrass	141,068.66	3.24
Shell Hash Present	116,511.99	2.67

FIGURE 3c
Study Area C
Substrate Characterization Map

LLOYD ENGINEERS, INC.
BLUEWATER SPM PROJECT
NUECES & ARANSAS COUNTIES
TEXAS

DRAWN BY: EAE
CHECKED: JRM/TMA
DATE: 4/10/2019
APPROVED:

LEGEND

- Sample Plot/Ekman
- Study Area
- Intertidal Marsh
- Seagrass
- Shell Hash Present
- Scattered Oyster Shell
- Deep Water, 8ft+
- FIRM, MODERATELY FIRM, OR SOFT MUD/SAND
- INLAND

0 500 1,000 2,000 Feet

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REFERENCE:
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Appendix B

Transect Sampling Data

STUDY AREA "A"
Transect Sampling Data

Bluewater Texas Terminal LLC
Bluewater SPM Project
Appendix B
Study Area A - Transect Sampling Data

Transect Point I.D.	Substrate Field Symbol	Study Area and Observed Substrate Type	Latitude	Longitude
4722	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.894063	-97.13111916
4721	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8940652	-97.1312739
4720	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8940674	-97.13142864
4728	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89420048	-97.13111669
4727	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89420268	-97.13127143
4726	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89420488	-97.13142617
4725	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89420707	-97.13158091
4724	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89420927	-97.13173565
4723	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89421147	-97.13189039
4735	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89433796	-97.13111422
4734	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89434016	-97.13126896
4733	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89434236	-97.1314237
4732	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89434456	-97.13157844
4731	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89434675	-97.13173318
4730	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89434895	-97.13188792
4729	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89435114	-97.13204266
4744	H	STUDY AREA A - SHELL HASH PRESENCE	27.89447545	-97.13111174
4743	H	STUDY AREA A - SHELL HASH PRESENCE	27.89447764	-97.13126648
4742	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89447984	-97.13142122
4741	H	STUDY AREA A - SHELL HASH PRESENCE	27.89448204	-97.13157597
4740	H	STUDY AREA A - SHELL HASH PRESENCE	27.89448423	-97.13173071
4739	H	STUDY AREA A - SHELL HASH PRESENCE	27.89448643	-97.13188545
4738	H	STUDY AREA A - SHELL HASH PRESENCE	27.89448863	-97.13204019
4737	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89449082	-97.13219493
4736	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89449302	-97.13234967
4754	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89461293	-97.13110927
4753	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89461513	-97.13126401
4752	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89461732	-97.13141875
4751	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89461952	-97.13157349
4750	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89462172	-97.13172824
4749	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89462391	-97.13188298
4748	I	STUDY AREA A - INTERTIDAL MARSH PRESENCE	27.89462611	-97.13203772
4747	I	STUDY AREA A - INTERTIDAL MARSH PRESENCE	27.8946283	-97.13219246
4746	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8946305	-97.1323472
4745	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.8946327	-97.13250194
4767	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89474821	-97.13095206
4766	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89475041	-97.1311068
4765	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89475261	-97.13126154
4764	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8947548	-97.13141628
4763	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.894757	-97.13157102
4762	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8947592	-97.13172576
4761	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89476139	-97.1318805
4760	I	STUDY AREA A - INTERTIDAL MARSH PRESENCE	27.89476359	-97.13203524
4759	I	STUDY AREA A - INTERTIDAL MARSH PRESENCE	27.89476579	-97.13218999
4758	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89476798	-97.13234473
4757	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89477018	-97.13249947
4756	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89477237	-97.13265421

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Appendix B
Study Area A - Transect Sampling Data

Transect Point I.D.	Substrate Field Symbol	Study Area and Observed Substrate Type	Latitude	Longitude
4755	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89477457	-97.13280895
4781	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89488569	-97.13094958
4780	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89488789	-97.13110433
4779	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89489009	-97.13125907
4778	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89489229	-97.13141381
4777	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89489448	-97.13156855
4776	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89489668	-97.13172329
4775	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89489887	-97.13187803
4774	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89490107	-97.13203277
4773	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89490327	-97.13218751
4772	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89490546	-97.13234226
4771	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89490766	-97.132497
4770	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89490985	-97.13265174
4769	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89491205	-97.13280648
4768	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89491424	-97.13296122
4797	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89502318	-97.13094711
4796	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89502537	-97.13110185
4795	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89502757	-97.13125659
4794	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89502977	-97.13141133
4793	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89503196	-97.13156608
4792	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89503416	-97.13172082
4791	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89503636	-97.13187556
4790	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89503855	-97.1320303
4789	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89504075	-97.13218504
4788	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89504294	-97.13233978
4787	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89504514	-97.13249453
4786	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89504734	-97.13264927
4785	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89504953	-97.13280401
4784	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89505173	-97.13295875
4783	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89505392	-97.13311349
4782	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89505612	-97.13326824
4814	H	STUDY AREA A - SHELL HASH PRESENCE	27.89516066	-97.13094464
4813	H	STUDY AREA A - SHELL HASH PRESENCE	27.89516285	-97.13109938
4812	H	STUDY AREA A - SHELL HASH PRESENCE	27.89516505	-97.13125412
4811	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89516725	-97.13140886
4810	H	STUDY AREA A - SHELL HASH PRESENCE	27.89516945	-97.1315636
4809	H	STUDY AREA A - SHELL HASH PRESENCE	27.89517164	-97.13171835
4808	H	STUDY AREA A - SHELL HASH PRESENCE	27.89517384	-97.13187309
4807	H	STUDY AREA A - SHELL HASH PRESENCE	27.89517603	-97.13202783
4806	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89517823	-97.13218257
4805	H	STUDY AREA A - SHELL HASH PRESENCE	27.89518043	-97.13233731
4804	H	STUDY AREA A - SHELL HASH PRESENCE	27.89518262	-97.13249206
4803	H	STUDY AREA A - SHELL HASH PRESENCE	27.89518482	-97.1326468
4802	H	STUDY AREA A - SHELL HASH PRESENCE	27.89518701	-97.13280154
4801	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89518921	-97.13295628
4800	H	STUDY AREA A - SHELL HASH PRESENCE	27.8951914	-97.13311102
4799	H	STUDY AREA A - SHELL HASH PRESENCE	27.8951936	-97.13326577

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Study Area A - Transect Sampling Data

Transect Point I.D.	Substrate Field Symbol	Study Area and Observed Substrate Type	Latitude	Longitude
4798	H	STUDY AREA A - SHELL HASH PRESENCE	27.89519579	-97.13342051
4833	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89529814	-97.13094216
4832	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89530034	-97.13109691
4831	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89530253	-97.13125165
4830	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89530473	-97.13140639
4829	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89530693	-97.13156113
4828	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89530912	-97.13171587
4827	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89531132	-97.13187062
4826	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89531352	-97.13202536
4825	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89531571	-97.1321801
4824	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89531791	-97.13233484
4823	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8953201	-97.13248959
4822	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8953223	-97.13264433
4821	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89532449	-97.13279907
4820	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89532669	-97.13295381
4819	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89532888	-97.13310855
4818	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89533108	-97.1332633
4817	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89533327	-97.13341804
4816	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89533547	-97.13357278
4815	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89533766	-97.13372752
4853	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89543562	-97.13093969
4852	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89543782	-97.13109443
4851	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89544002	-97.13124917
4850	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89544221	-97.13140392
4849	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89544441	-97.13155866
4848	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89544661	-97.13171134
4847	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8954488	-97.13186814
4846	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.895451	-97.13202289
4845	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89545319	-97.13217763
4844	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89545539	-97.13233237
4843	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89545759	-97.13248711
4842	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89545978	-97.13264186
4841	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89546198	-97.1327966
4840	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89546417	-97.13295134
4839	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89546637	-97.13310608
4838	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89546856	-97.13326083
4837	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89547076	-97.13341557
4836	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89547295	-97.13357031
4835	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89547514	-97.13372505
4834	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89547734	-97.1338798
4876	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8955709	-97.13078247
4875	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8955731	-97.13093722
4874	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8955753	-97.13109196
4873	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8955775	-97.1312467
4872	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89557969	-97.13140144
4871	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89558189	-97.13155619
4870	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89558409	-97.13171093

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Study Area A - Transect Sampling Data

Transect Point I.D.	Substrate Field Symbol	Study Area and Observed Substrate Type	Latitude	Longitude
4869	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89558628	-97.13186567
4868	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89558848	-97.13202041
4867	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89559068	-97.13217516
4866	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89559287	-97.1323299
4865	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89559507	-97.13248464
4864	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89559726	-97.13263938
4863	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89559946	-97.13279413
4862	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89560165	-97.13294887
4861	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89560385	-97.13310361
4860	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89560604	-97.13325836
4859	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89560824	-97.1334131
4858	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89561043	-97.13356784
4857	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89561263	-97.13372258
4856	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89561482	-97.13387733
4855	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89561701	-97.13403207
4854	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89561921	-97.13418681
4900	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89570839	-97.13078
4899	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89571058	-97.13093474
4898	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89571278	-97.13108949
4897	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89571498	-97.13124423
4896	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89571718	-97.13139897
4895	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89571937	-97.13155371
4894	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89572157	-97.13170846
4893	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89572376	-97.1318632
4892	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89572596	-97.13201794
4891	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89572816	-97.13217269
4890	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89573035	-97.13232743
4889	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89573255	-97.13248217
4888	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89573474	-97.13263691
4887	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89573694	-97.13279166
4886	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89573913	-97.1329464
4885	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89574133	-97.13310114
4884	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89574352	-97.13325589
4883	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89574572	-97.13341063
4882	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89574791	-97.13356537
4881	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89575011	-97.13372011
4880	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8957523	-97.13387486
4879	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8957545	-97.1340296
4878	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89575669	-97.13418434
4877	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89575888	-97.13433909
4926	H	STUDY AREA A - SHELL HASH PRESENCE	27.89584587	-97.13077753
4925	H	STUDY AREA A - SHELL HASH PRESENCE	27.89584807	-97.13093227
4924	H	STUDY AREA A - SHELL HASH PRESENCE	27.89585026	-97.13108701
4923	H	STUDY AREA A - SHELL HASH PRESENCE	27.89585246	-97.13124176
4922	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89585466	-97.1313965
4921	H	STUDY AREA A - SHELL HASH PRESENCE	27.89585685	-97.13155124
4920	H	STUDY AREA A - SHELL HASH PRESENCE	27.89585905	-97.13170598

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Study Area A - Transect Sampling Data

Transect Point I.D.	Substrate Field Symbol	Study Area and Observed Substrate Type	Latitude	Longitude
4919	H	STUDY AREA A - SHELL HASH PRESENCE	27.89586125	-97.13186073
4918	H	STUDY AREA A - SHELL HASH PRESENCE	27.89586344	-97.13201547
4917	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89586564	-97.13217021
4916	H	STUDY AREA A - SHELL HASH PRESENCE	27.89586783	-97.13232496
4915	H	STUDY AREA A - SHELL HASH PRESENCE	27.89587003	-97.1324797
4914	H	STUDY AREA A - SHELL HASH PRESENCE	27.89587223	-97.13263444
4913	H	STUDY AREA A - SHELL HASH PRESENCE	27.89587442	-97.13278919
4912	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89587662	-97.13294393
4911	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89587881	-97.13309867
4910	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89588101	-97.13325342
4909	H	STUDY AREA A - SHELL HASH PRESENCE	27.8958832	-97.13340816
4908	H	STUDY AREA A - SHELL HASH PRESENCE	27.89588539	-97.1335629
4907	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89588759	-97.13371764
4906	H	STUDY AREA A - SHELL HASH PRESENCE	27.89588978	-97.13387239
4905	H	STUDY AREA A - SHELL HASH PRESENCE	27.89589198	-97.13402713
4904	H	STUDY AREA A - SHELL HASH PRESENCE	27.89589417	-97.13418187
4903	H	STUDY AREA A - SHELL HASH PRESENCE	27.89589636	-97.13433662
4902	H,R	STUDY AREA A - SHELL HASH PRESENCE	27.89589856	-97.13449136
4901	H	STUDY AREA A - SHELL HASH PRESENCE	27.89590075	-97.1346461
4953	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89598335	-97.13077505
4952	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89598555	-97.1309298
4951	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89598774	-97.13108454
4950	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89598994	-97.13123928
4949	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89599214	-97.13139403
4948	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89599434	-97.13154877
4947	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89599653	-97.13170351
4946	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89599873	-97.13185826
4945	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89600092	-97.132013
4944	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89600312	-97.13216774
4943	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89600532	-97.13232249
4942	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89600751	-97.13247723
4941	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89600971	-97.13263197
4940	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8960119	-97.13278672
4939	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8960141	-97.13294146
4938	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89601629	-97.1330962
4937	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89601849	-97.13325095
4936	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89602068	-97.13340569
4935	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89602288	-97.13356043
4934	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89602507	-97.13371518
4933	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89602726	-97.13386992
4932	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89602946	-97.13402466
4931	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89603165	-97.1341794
4930	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89603385	-97.13433415
4929	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89603604	-97.13448889
4928	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89603823	-97.13464363
4927	D	STUDY AREA A - DEEP, 8+ FT	27.89604042	-97.13479838
4982	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89612083	-97.13077258

Bluewater Texas Terminal LLC
Bluewater SPM Project
Appendix B
Study Area A - Transect Sampling Data

Transect Point I.D.	Substrate Field Symbol	Study Area and Observed Substrate Type	Latitude	Longitude
4981	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89612303	-97.13092732
4980	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89612523	-97.13108207
4979	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89612742	-97.13123681
4978	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89612962	-97.13139155
4977	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89613182	-97.1315463
4976	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89613401	-97.13170104
4975	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89613621	-97.13185578
4974	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89613841	-97.13201053
4973	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8961406	-97.13216527
4972	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8961428	-97.13232001
4971	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89614499	-97.13247476
4970	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89614719	-97.1326295
4969	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89614938	-97.13278424
4968	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89615158	-97.13293899
4967	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89615377	-97.13309373
4966	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89615597	-97.13324848
4965	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89615816	-97.13340322
4964	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89616036	-97.13355796
4963	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89616255	-97.1337127
4962	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89616475	-97.13386745
4961	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89616694	-97.13402219
4960	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89616913	-97.13417694
4959	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89617133	-97.13433168
4958	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89617352	-97.13448642
4957	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89617571	-97.13464117
4956	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89617791	-97.13479591
4955	D	STUDY AREA A - DEEP, 8+ FT	27.8961801	-97.13495065
4954	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89618229	-97.1351054
5012	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89625831	-97.13077011
5011	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89626051	-97.13092485
5010	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89626271	-97.13107959
5009	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89626491	-97.13123434
5008	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8962671	-97.13138908
5007	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8962693	-97.13154382
5006	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.8962715	-97.13169857
5005	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89627369	-97.13185331
5004	S,G	STUDY AREA A - SEAGRASS PRESENCE	27.89627589	-97.13200806
5003	M,G	STUDY AREA A - SEAGRASS PRESENCE	27.89627808	-97.1321628
5002	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89628028	-97.13231754
5001	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89628248	-97.13247229
5000	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89628467	-97.13262703
4999	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89628687	-97.13278177
4998	F,G	STUDY AREA A - SEAGRASS PRESENT	27.89628906	-97.13293652
4997	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89629126	-97.13309126
4996	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89629345	-97.133246
4995	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89629565	-97.13340075
4994	F	STUDY AREA A - FIRM, MODERATELY FIRM, OR SOFT MUD/SAND	27.89629784	-97.13355549