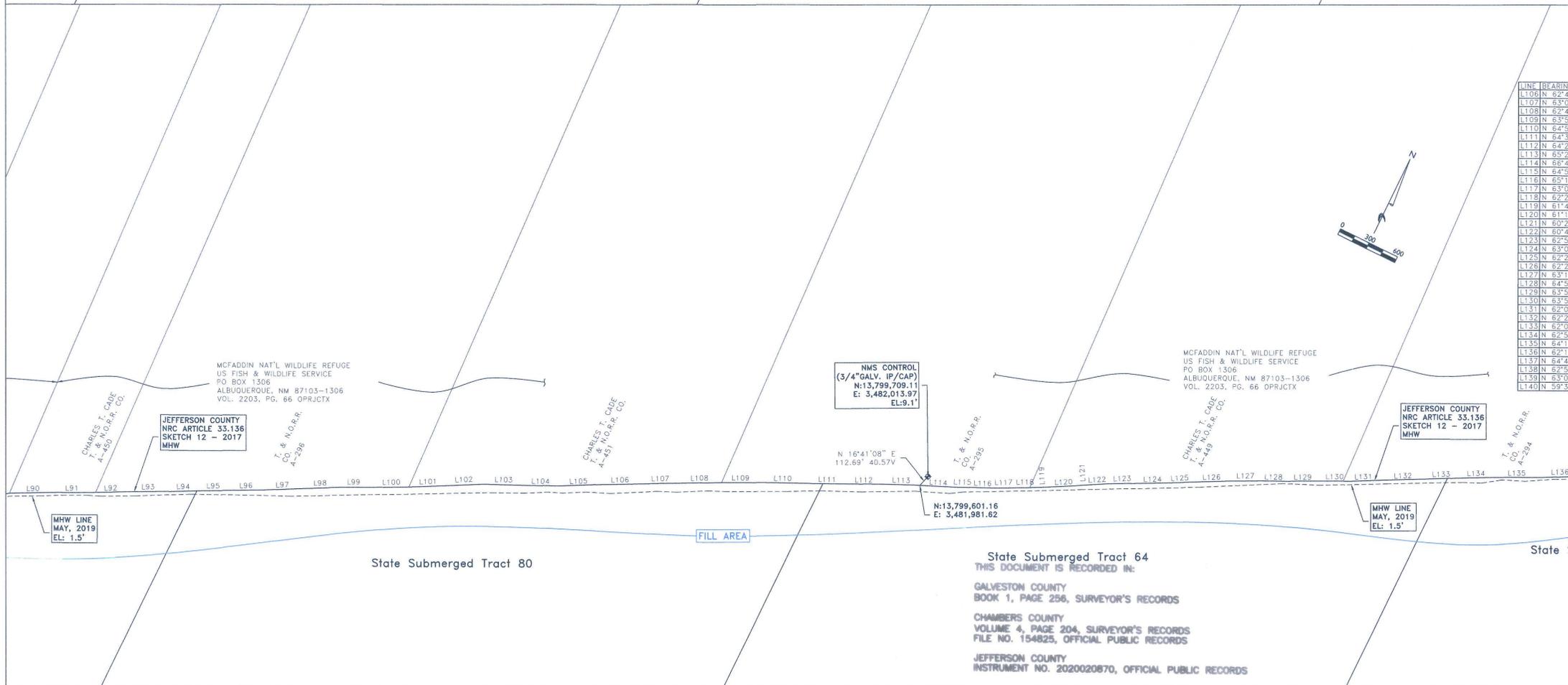
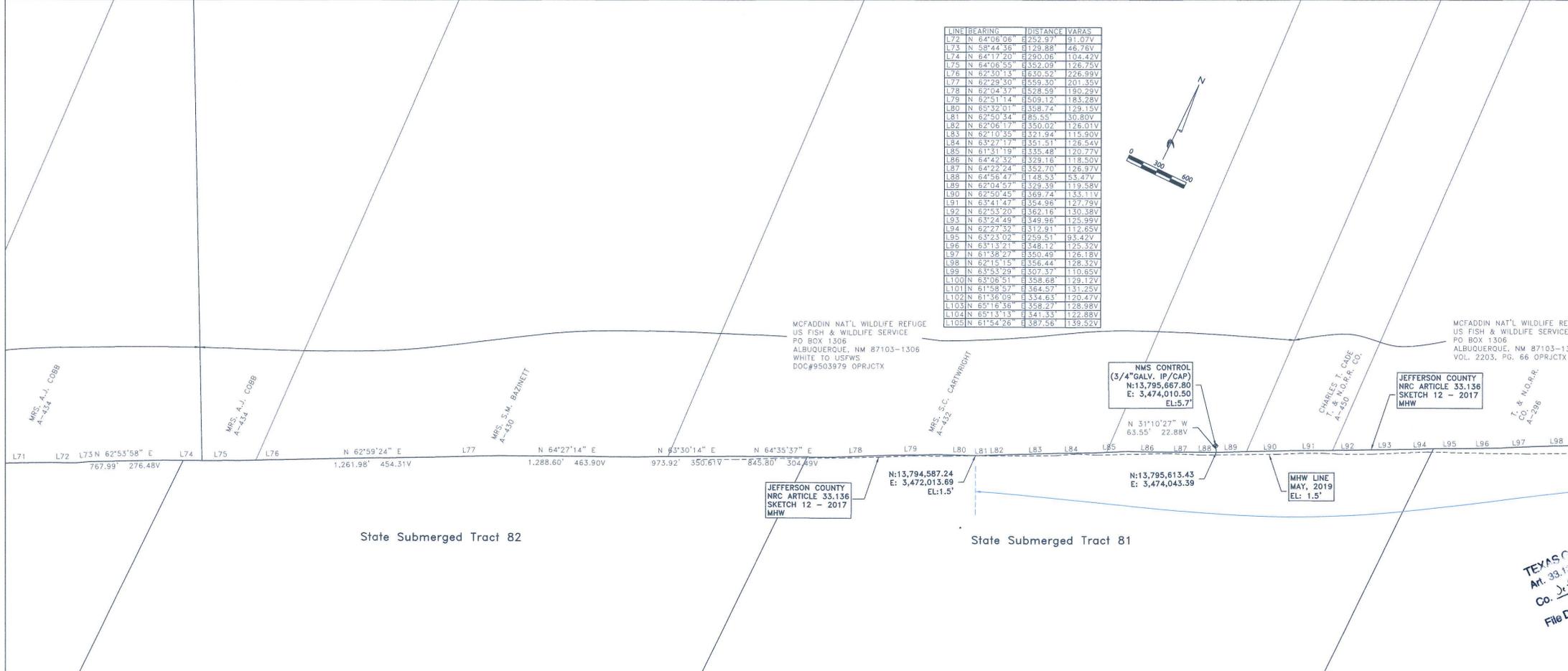
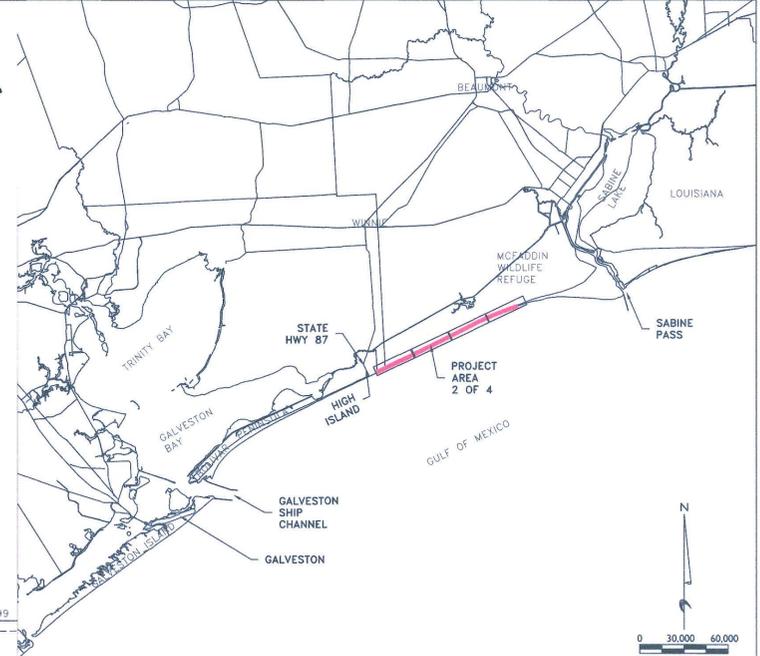


LINE	BEARING	DISTANCE	VARIAS
L72	N 84°06'06"	8232.97	81.07V
L73	N 58°44'36"	8129.88	46.76V
L74	N 64°17'20"	8290.06	104.42V
L75	N 84°06'55"	8352.09	126.75V
L76	N 62°30'13"	8650.32	278.99V
L77	N 62°29'30"	8559.30	201.35V
L78	N 62°04'37"	8528.59	190.29V
L79	N 62°51'14"	8509.12	183.28V
L80	N 85°32'01"	8398.74	129.15V
L81	N 62°50'34"	885.55	30.80V
L82	N 62°06'17"	8350.02	126.01V
L83	N 62°10'35"	8321.94	115.90V
L84	N 63°27'17"	8351.51	128.54V
L85	N 61°31'19"	8335.48	120.77V
L86	N 64°42'32"	8329.16	118.50V
L87	N 64°22'24"	8352.70	126.97V
L88	N 64°56'47"	8168.53	83.42V
L89	N 62°04'57"	8329.39	119.58V
L90	N 62°50'45"	8369.74	133.11V
L91	N 63°41'47"	8349.96	127.79V
L92	N 62°53'20"	8362.16	130.38V
L93	N 63°24'49"	8349.96	125.99V
L94	N 62°27'32"	8312.91	112.65V
L95	N 63°23'02"	8259.51	83.42V
L96	N 63°13'21"	8348.12	129.32V
L97	N 61°38'27"	8350.49	126.18V
L98	N 62°15'15"	8356.44	128.32V
L99	N 63°53'29"	8307.37	110.65V
L100	N 63°06'51"	8358.68	129.12V
L101	N 61°58'57"	8364.57	131.25V
L102	N 61°36'09"	8334.63	120.47V
L103	N 63°16'36"	8358.27	128.98V
L104	N 65°13'13"	8341.33	122.88V
L105	N 61°54'26"	8387.56	139.52V



TEXAS CENTRAL LAND OFFICE
 Art. 33, Natural Resources Code
 Co. Jefferson, Sec. No. 13
 File Date 01/26/2019 by K. Schreiner

NOTES:
 1. ALL COORDINATES REFER TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (#4204), AS DEFINED BY ARTICLE 21.071 OF THE NATURAL RESOURCES CODE OF THE STATE OF TEXAS, 1983 DATUM (2011), US FEET. ALL BEARINGS ARE LAMBERT GRID BEARINGS AND ALL DISTANCES GRID. THE SCALE FACTOR IS 0.999871555 AND MAPPING ANGLE IS 02d 17' 04".

2. COORDINATES AND ELEVATIONS ARE BASED ON NGS MONUMENTS & ON OPUS SOLUTIONS. VERTICAL DATUM: NAVD88

NGS MONUMENT "FADDEN"	NGS MONUMENT "877 0923 E"
N:13,818,416.50	N:13,765,402.04
E: 3,519,789.40	E: 3,411,293.73
EL: 2.4' NAVD88	EL: 4.8' NAVD88
NGS MONUMENT "REBECCA 2"	NMS CONTROL (3/4" GALV. IP/CAP)
N:13,828,404.20	N:13,776,219.90
E: 3,545,493.70	E: 3,434,047.10
EL: 3.6' NAVD88	EL: 4.5' NAVD88

3. ALL POSITIONS AND ELEVATIONS RECORDED USING SURVEY GRADE, RTK GPS. EQUIPMENT: HEMISPHERE S320 OR TRIMBLE R8.

4. STATE OWNERSHIP BOUNDARY BASED MEAN HIGH WATER (MHW) CONTOUR. MHW ELEVATION OF 1.5' FOR THE GULF OF MEXICO WAS DETERMINED FROM PLEASURE PIER TIDE GAUGE AND HIGH ISLAND TIDE GAUGE.

5. TO CONVERT FEET TO VARAS MULTIPLY BY 0.36.

6. UPLAND TRACT LINES SHOWN HEREON ARE BASED ON MCFADDEN NATIONAL WILDLIFE REFUGE INTERNAL GIS DATA, DEED DESCRIPTIONS, AND GALVESTON, CHAMBERS, AND JEFFERSON COUNTY APPRAISAL DISTRICT MAPS. LINES ARE SHOWN FOR REFERENCE ONLY.

7. EROSION RESPONSE WORK:
 DUNE RESTORATION AND BEACH NOURISHMENT, UNDER AUTHORITY OF COASTAL EROSION PLANNING AND RESPONSE ACT (CEPRA) PROJECT NO. 1658

8. REFERENCE ACCOMPANYING REPORT CONTAINING FIELD NOTES DATED MAY, 2019 FOR ADDITIONAL INFORMATION.

I, JAMES M. NAISMITH, HEREBY STATE THAT THIS DRAWING REPRESENTS A SURVEY THAT IS CORRECT; IN ACCORDANCE WITH SECTION 21.042 TEXAS NATURAL RESOURCES CODE, WAS MADE ACCORDING TO LAW; WAS MADE IN THE FIELD UNDER MY DIRECT CONTROL AND SUPERVISION; WAS MADE UTILIZING METHODOLOGY APPROVED BY THE GLO; AND IS RECORDED IN

NOTICE: THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH SECTION 33.136, NATURAL RESOURCES CODE, FOR THE PURPOSE OF EVIDENCING THE LOCATION OF THE SHORELINE IN THE AREA DEPICTED IN THIS SURVEY AS THAT SHORELINE EXISTED BEFORE COMMENCEMENT OF EROSION RESPONSE ACTIVITY, AS REQUIRED BY CHAPTER 33, NATURAL RESOURCES CODE. THE LINE DEPICTED ON THIS SURVEY FIXES THE SHORELINE FOR THE PURPOSE OF LOCATING A SHORELINE BOUNDARY, SUBJECT TO MOVEMENT LANDWARD AS PROVIDED BY SECTION 33.136, NATURAL RESOURCES CODE.

THERE ARE TWO AREAS OF FILL OR BULKHEAD LOCATED WITHIN THE SURVEYED AREA. THERE ARE NO RETAINING WALLS WITHIN THE SURVEYED AREA.

SURVEYED: MAY 1-3 & 23-24, 2019 SURVEY PERSONNEL:
 JAMES M. NAISMITH
 J. ZAC GIESSEL

JAMES M. NAISMITH
 LICENSED STATE LAND SURVEYOR

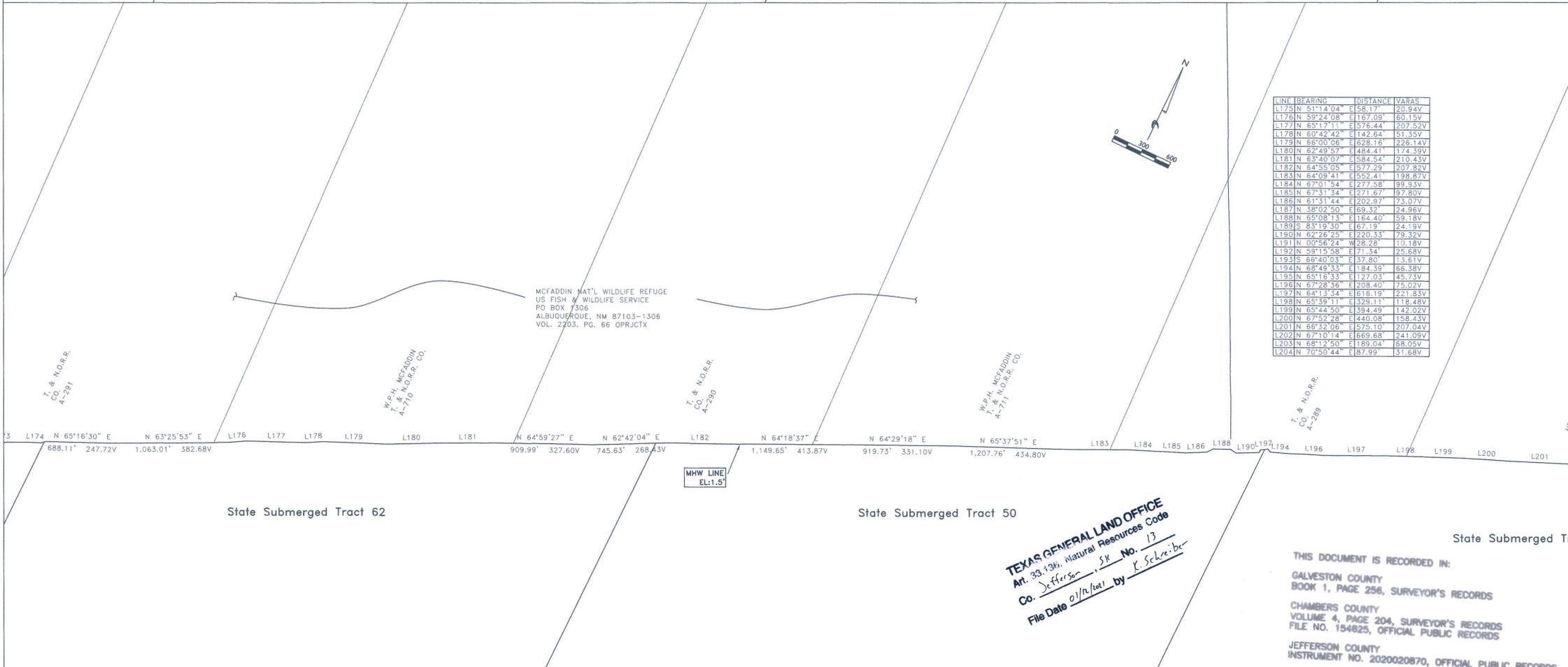
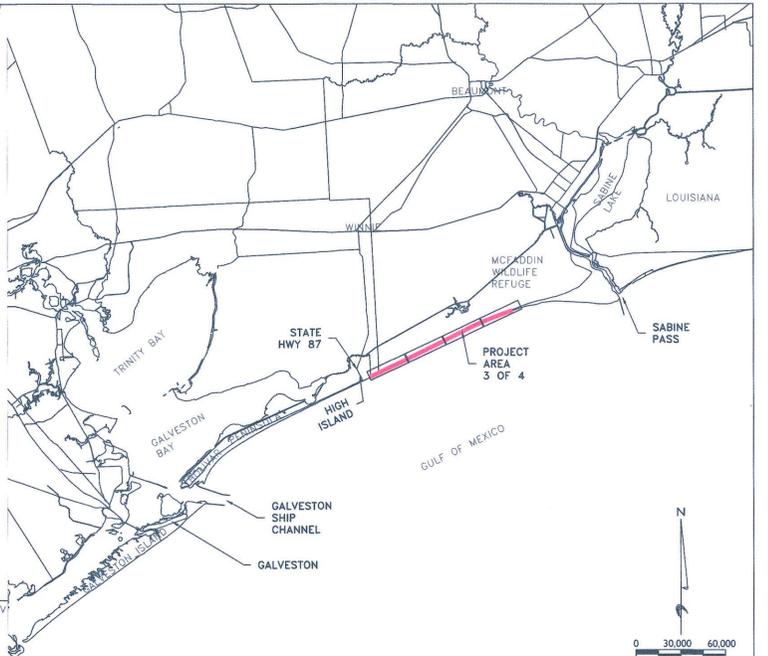
NO.	DATE	REVISION	CONTR: HDR ENGINEERING, INC

COASTAL BOUNDARY SURVEY OF A PORTION OF MCFADDIN NAT'L WILDLIFE REFUGE ADJACENT TO GOM STATE TRACTS 14, 48-51, 62-66, 80-82, & 98-101 FROM HIGH ISLAND TO SEA RIM STATE PARK, GALVESTON, CHAMBERS, & JEFFERSON COUNTIES, TX

SCALE: 1" = 600'
 DWN. BY: JZG SHEET 2 OF 4 DATE: MAY 2019

State Submerged Tract 64
 THIS DOCUMENT IS RECORDED IN:
 GALVESTON COUNTY
 BOOK 1, PAGE 256, SURVEYOR'S RECORDS
 CHAMBERS COUNTY
 VOLUME 4, PAGE 204, SURVEYOR'S RECORDS
 FILE NO. 154825, OFFICIAL PUBLIC RECORDS
 JEFFERSON COUNTY
 INSTRUMENT NO. 2020020870, OFFICIAL PUBLIC RECORDS

Naismith Marine
 Hydrographic • Geophysical
 Environmental
 www.naismithmarine.com
 (361) 945-0248
 FIRM #10078500



NOTES:

- ALL COORDINATES REFER TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (#4204), AS DEFINED BY ARTICLE 21.071 OF THE NATURAL RESOURCES CODE OF THE STATE OF TEXAS, 1983 DATUM (2011), US FEET. ALL BEARINGS ARE LAMBERT GRID BEARINGS AND ALL DISTANCES GRID. THE SCALE FACTOR IS 0.999871555 AND MAPPING ANGLE IS 02d 17' 04".
- COORDINATES AND ELEVATIONS ARE BASED ON NGS MONUMENTS & ON OPUS SOLUTIONS. VERTICAL DATUM: NAVD88

NGS MONUMENT "FADDEN"	NGS MONUMENT "877 0923 E"
N: 13,818,416.50	N: 13,765,402.04
E: 3,519,789.40	E: 3,411,293.73
EL: 2.4' NAVD88	EL: 4.8' NAVD88

NGS MONUMENT "REBECCA 2"	NMS CONTROL (3" GALV. IP/CAP)
N: 13,828,404.20	N: 13,776,219.90
E: 3,545,493.70	E: 3,434,047.10
EL: 3.6' NAVD88	EL: 4.5' NAVD88

NMS CONTROL 1" GALV. IP W/ALUMINUM CAP "CP1"
 N: 13,784,262.32
 E: 3,449,966.02
 EL: 4.8'
- ALL POSITIONS AND ELEVATIONS RECORDED USING SURVEY GRADE, RTK GPS. EQUIPMENT: HEMISPHERE S320 OR TRIMBLE R8.
- STATE OWNERSHIP BOUNDARY BASED MEAN HIGH WATER (MHW) CONTOUR. MHW ELEVATION OF 1.5' FOR THE GULF OF MEXICO WAS DETERMINED FROM PLEASURE PIER TIDE GAUGE AND HIGH ISLAND TIDE GAUGE.
- TO CONVERT FEET TO VARAS MULTIPLY BY 0.36.
- UPLAND TRACT LINES SHOWN HEREON ARE BASED ON MCFADDEN NATIONAL WILDLIFE REFUGE INTERNAL GIS DATA, DEED DESCRIPTIONS, AND GALVESTON, CHAMBERS, AND JEFFERSON COUNTY APPRAISAL DISTRICT MAPS. LINES ARE SHOWN FOR REFERENCE ONLY.
- EROSION RESPONSE WORK:
 DUNE RESTORATION AND BEACH NOURISHMENT, UNDER AUTHORITY OF COASTAL EROSION PLANNING AND RESPONSE ACT (CEPRA) PROJECT NO. 1658
- REFERENCE ACCOMPANYING REPORT CONTAINING FIELD NOTES DATED MAY, 2019 FOR ADDITIONAL INFORMATION.

I, JAMES M. NAISMITH, HEREBY STATE THAT THIS DRAWING REPRESENTS A SURVEY THAT IS CORRECT; IN ACCORDANCE WITH SECTION 21.042 TEXAS NATURAL RESOURCES CODE, WAS MADE ACCORDING TO LAW; WAS MADE IN THE FIELD UNDER MY DIRECT CONTROL AND SUPERVISION; WAS MADE UTILIZING METHODOLOGY APPROVED BY THE GLO; AND IS RECORDED IN

NOTICE: THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH SECTION 33.136, NATURAL RESOURCES CODE, FOR THE PURPOSE OF EVIDENCING THE LOCATION OF THE SHORELINE IN THE AREA DEPICTED IN THIS SURVEY AS THAT SHORELINE EXISTED BEFORE COMMENCEMENT OF EROSION RESPONSE ACTIVITY, AS REQUIRED BY CHAPTER 33, NATURAL RESOURCES CODE. THE LINE DEPICTED ON THIS SURVEY FIXES THE SHORELINE FOR THE PURPOSE OF LOCATING A SHORELINE BOUNDARY, SUBJECT TO MOVEMENT LANDWARD AS PROVIDED BY SECTION 33.136, NATURAL RESOURCES CODE.

THERE ARE TWO AREAS OF FILL OR BUILDUP LOCATED WITHIN THE SURVEYED AREA. THERE ARE NO RETAINING WALLS WITHIN THE SURVEYED AREA.

SURVEYED: MAY 1-3 & 23-24, 2019 SURVEY PERSONNEL:
 JAMES M. NAISMITH
 J. ZAC GIESSEL

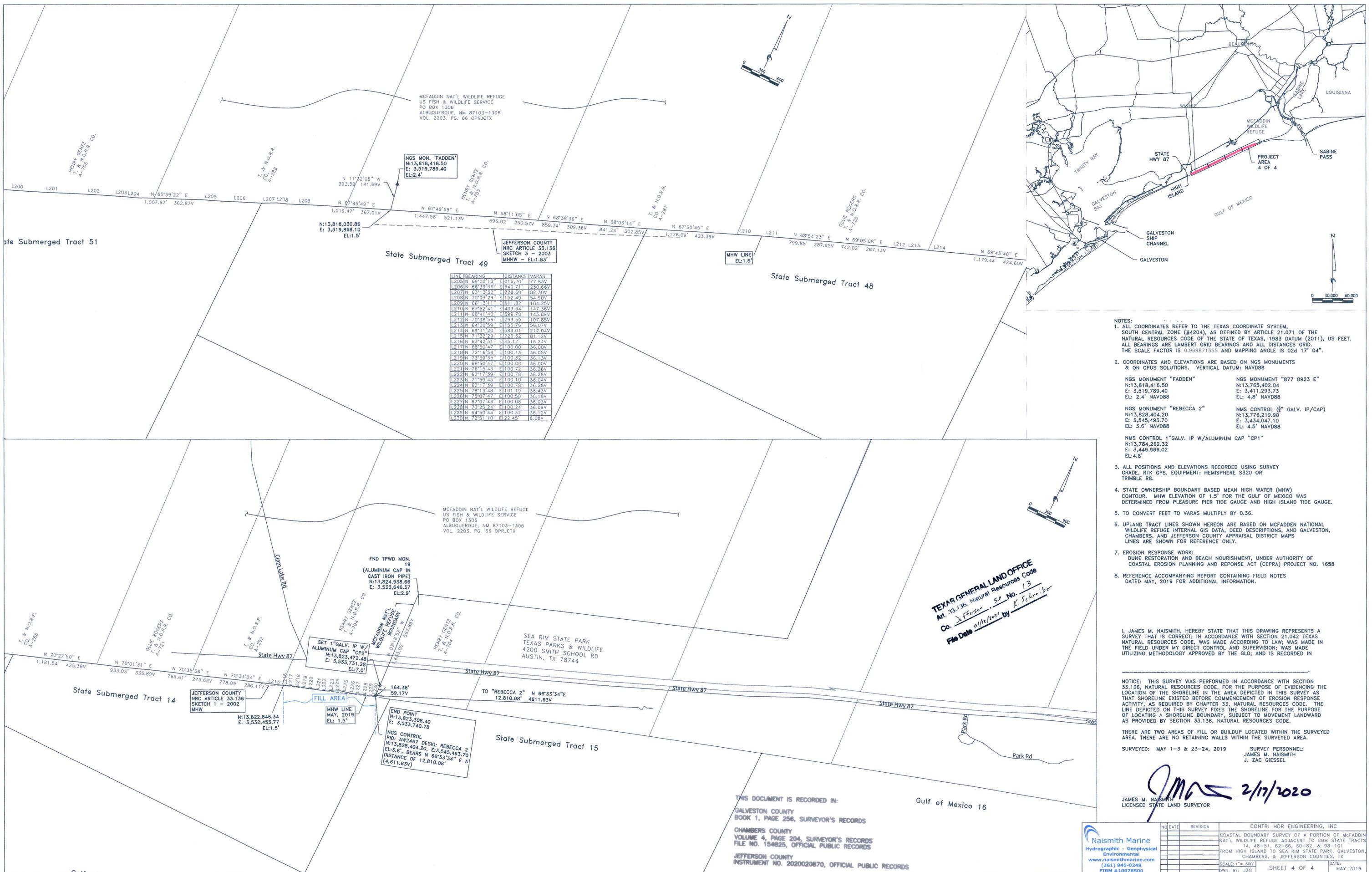
THIS DOCUMENT IS RECORDED IN:
 GALVESTON COUNTY
 BOOK 1, PAGE 258, SURVEYOR'S RECORDS
 CHAMBERS COUNTY
 VOLUME 4, PAGE 204, SURVEYOR'S RECORDS
 FILE NO. 154825, OFFICIAL PUBLIC RECORDS
 JEFFERSON COUNTY
 INSTRUMENT NO. 2020020870, OFFICIAL PUBLIC RECORDS

NAISMITH MARINE
 Hydrographic - Geophysical
 Environmental
 www.naismithmarine.com
 (361) 945-0248
 FIRM #10078500

NO DATE REVISION CONTR: HDR ENGINEERING, INC
 COASTAL BOUNDARY SURVEY OF A PORTION OF MCFADDEN NAT'L WILDLIFE REFUGE ADJACENT TO GOM STATE TRACTS 14, 45-51, 62-66, 80-82 & 98-101 FROM HIGH ISLAND TO SEA RIM STATE PARK, GALVESTON, CHAMBERS, & JEFFERSON COUNTIES, TX
 SCALE: 1"= 600'
 DWN. BY: JZG SHEET 3 OF 4 DATE: MAY 2019

TEXAS GENERAL LAND OFFICE
 Art. 33.136, Natural Resources Code
 Co. Jefferson, Sk No. 13
 File Date 01/16/21 by K. Seckreibe

JAMES M. NAISMITH
 LICENSED STATE LAND SURVEYOR
 2/17/2020



LINE	BEARING	DISTANCE	VARAS
L205	N 69°02'13"	E 216.20'	77.83V
L206	N 68°59'36"	E 140.71'	230.86V
L207	N 63°13'32"	E 228.60'	82.30V
L208	N 70°03'29"	E 152.49'	54.90V
L209	N 66°13'11"	E 511.82'	184.25V
L210	N 67°52'41"	E 409.34'	147.36V
L211	N 68°41'40"	E 399.70'	143.89V
L212	N 70°38'56"	E 299.59'	107.85V
L213	N 64°00'59"	E 155.75'	56.07V
L214	N 69°31'20"	E 599.01'	212.04V
L215	N 71°22'29"	E 225.32'	81.12V
L216	N 63°42'31"	E 45.12'	16.24V
L217	N 68°50'47"	E 100.00'	36.00V
L218	N 72°18'54"	E 100.13'	36.05V
L219	N 73°59'35"	E 100.32'	36.13V
L220	N 68°50'47"	E 100.00'	36.00V
L221	N 76°15'43"	E 100.72'	36.26V
L222	N 62°17'59"	E 100.78'	36.28V
L223	N 71°59'45"	E 100.10'	36.04V
L224	N 62°17'59"	E 100.78'	36.28V
L225	N 78°13'48"	E 101.19'	36.43V
L226	N 72°07'47"	E 100.50'	36.18V
L227	N 67°07'43"	E 100.08'	36.03V
L228	N 73°25'24"	E 100.24'	36.09V
L229	N 64°50'43"	E 100.32'	36.12V
L230	N 72°51'10"	E 122.45'	43.08V

- NOTES:
1. ALL COORDINATES REFER TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (#4204), AS DEFINED BY ARTICLE 21.071 OF THE NATURAL RESOURCES CODE OF THE STATE OF TEXAS, 1983 DATUM (2011), US FEET. ALL BEARINGS ARE LAMBERT GRID BEARINGS AND ALL DISTANCES GRID. THE SCALE FACTOR IS 0.999871555 AND MAPPING ANGLE IS 02d 17' 04".
 2. COORDINATES AND ELEVATIONS ARE BASED ON NGS MONUMENTS & ON OPUS SOLUTIONS. VERTICAL DATUM: NAVD83

NGS MONUMENT "FADDEN" N:13,818,416.50 E: 3,519,789.40 EL: 2.4' NAVD88	NGS MONUMENT "877 0923 E" N:13,765,402.04 E: 3,411,293.73 EL: 4.8' NAVD88
NGS MONUMENT "REBECCA 2" N:13,828,404.20 E: 3,545,493.70 EL: 3.6' NAVD88	NMS CONTROL (3rd) GALV. IP/CAP N:13,776,219.90 E: 3,434,047.10 EL: 4.5' NAVD88
NMS CONTROL 1" GALV. IP W/ALUMINUM CAP "CP1" N:13,784,262.32 E: 3,449,966.02 EL: 4.8'	
 3. ALL POSITIONS AND ELEVATIONS RECORDED USING SURVEY GRADE, RTK GPS. EQUIPMENT: HEMISPHERE S320 OR TRIMBLE R8.
 4. STATE OWNERSHIP BOUNDARY BASED MEAN HIGH WATER (MHW) CONTOUR. MHW ELEVATION OF 1.5' FOR THE GULF OF MEXICO WAS DETERMINED FROM PLEASURE PIER TIDE GAUGE AND HIGH ISLAND TIDE GAUGE.
 5. TO CONVERT FEET TO VARAS MULTIPLY BY 0.36.
 6. UPLAND TRACT LINES SHOWN HEREON ARE BASED ON MCFADDIN NATIONAL WILDLIFE REFUGE INTERNAL GIS DATA, DEED DESCRIPTIONS, AND GALVESTON CHAMBERS, AND JEFFERSON COUNTY APPRAISAL DISTRICT MAPS. LINES ARE SHOWN FOR REFERENCE ONLY.
 7. EROSION RESPONSE WORK: DUNE RESTORATION AND BEACH NOURISHMENT, UNDER AUTHORITY OF COASTAL EROSION PLANNING AND RESPONSE ACT (CEPRA) PROJECT NO. 1658
 8. REFERENCE ACCOMPANYING REPORT CONTAINING FIELD NOTES DATED MAY, 2019 FOR ADDITIONAL INFORMATION.

TEXAS GENERAL LAND OFFICE
 Art. 33.136, Natural Resources Code
 Co. Jefferson, Sr No. 13
 File Date 01/16/2021 by E. Schreiber

I, JAMES M. NAISMITH, HEREBY STATE THAT THIS DRAWING REPRESENTS A SURVEY THAT IS CORRECT; IN ACCORDANCE WITH SECTION 21.042 TEXAS NATURAL RESOURCES CODE, WAS MADE ACCORDING TO LAW; WAS MADE IN THE FIELD UNDER MY DIRECT CONTROL AND SUPERVISION; WAS MADE UTILIZING METHODOLOGY APPROVED BY THE GLO; AND IS RECORDED IN

NOTICE: THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH SECTION 33.136, NATURAL RESOURCES CODE, FOR THE PURPOSE OF EVIDENCING THE LOCATION OF THE SHORELINE IN THE AREA DEPICTED IN THIS SURVEY AS THAT SHORELINE EXISTED BEFORE COMMENCEMENT OF EROSION RESPONSE ACTIVITY, AS REQUIRED BY CHAPTER 33, NATURAL RESOURCES CODE. THE LINE DEPICTED ON THIS SURVEY FIXES THE SHORELINE FOR THE PURPOSE OF LOCATING A SHORELINE BOUNDARY, SUBJECT TO MOVEMENT LANDWARD AS PROVIDED BY SECTION 33.136, NATURAL RESOURCES CODE.

THERE ARE TWO AREAS OF FILL OR BUILDUP LOCATED WITHIN THE SURVEYED AREA. THERE ARE NO RETAINING WALLS WITHIN THE SURVEYED AREA.

SURVEYED: MAY 1-3 & 23-24, 2019 SURVEY PERSONNEL: JAMES M. NAISMITH, J. ZAC GIESSEL

JAMES M. NAISMITH
 LICENSED STATE LAND SURVEYOR
 2/17/2020

THIS DOCUMENT IS RECORDED IN:
 GALVESTON COUNTY
 BOOK 1, PAGE 256, SURVEYOR'S RECORDS
 CHAMBERS COUNTY
 VOLUME 4, PAGE 204, SURVEYOR'S RECORDS
 FILE NO. 154825, OFFICIAL PUBLIC RECORDS
 JEFFERSON COUNTY
 INSTRUMENT NO. 2020020870, OFFICIAL PUBLIC RECORDS

 Naismith Marine Hydrographic - Geophysical Environmental www.naismithmarine.com (361) 945-0248 FIRM #10078500	NO	DATE	REVISION	CONTR: HDR ENGINEERING, INC
				COASTAL BOUNDARY SURVEY OF A PORTION OF MCFADDIN NAT'L WILDLIFE REFUGE ADJACENT TO GOM STATE TRACTS 14, 48-51, 62-66, 80-82, & 98-101 FROM HIGH ISLAND TO SEA RIM STATE PARK, GALVESTON, CHAMBERS, & JEFFERSON COUNTIES, TX
				SCALE: 1" = 800'
				SHEET 4 OF 4
				DATE: MAY 2019



TEXAS GENERAL LAND OFFICE
GEORGE P. BUSH, COMMISSIONER

Surveying Division
Coastal Boundary Survey Approval

Project: McFaddin National Wildlife Refuge adjacent to Gulf of Mexico State Tracts 14, 48-51, 62-66, 80-82, & 98-101 from High Island to Sea Rim State Park, Galveston, Chambers, & Jefferson Counties, Tx

Project No: Coastal Erosion Planning and Response Act (CPERA) Project # 1658

Project Manager: Kelly Brooks, Coastal Resources

Surveyor: James M. Naismith, Licensed State Land Surveyor

Description: Coastal Boundary Survey, dated May 1-3 & 23-24, 2019, delineating the littoral boundary along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge adjacent to Gulf of Mexico & State Tracts 14, 48-51, 62-66, 80-82, & 98-101 in Galveston, Chambers, & Jefferson Counties, Texas in connection with planned Coastal Erosion Planning and Response Act (CEPRA) Project # 1658, Dune Restoration and Beach Nourishment. Centroid coordinates N 29°37'22", W 94°12'01", WGS84. A copy of the survey has been filed in Book 1, Page 256, Surveyor's Records of Galveston County, Texas, Volume 4, Page 204, Surveyor's Records, File Number 154825, Official Public Records of Chambers County, and Instrument Number 2020020870, Official Public Records of Jefferson County, Texas.

A Coastal Boundary Survey for the above-referenced project has been reviewed and accepted; upon completion of public notice requirements, the survey will be filed in the Texas General Land Office, Archives and Records, in accordance with provisions of the *Texas Natural Resources Code*, Chapter 33.136.

Approved:

Signed:

Surveying Division

9/10/2020

Date

Approval Filed as:

Tex.Nat.Res.Code Article 33.136, Jefferson County, Sketch No. 13

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code

Co. Jefferson, SK No. 13

File Date 01/12/2021 by K. Schreiber

Naismith Marine Services, Inc.

www.naismithmarine.com

(361) 945-0248

FIRM #10078500



TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SR No. 13
File Date 01/12/2021 by K. Schreiber

MAY 2019

BUILD UP/FILL AREA REPORT TO ACCOMPANY
COASTAL BOUNDARY SURVEY OF A PORTION OF
McFADDIN NATIONAL WILDLIFE REFUGE ADJACENT TO GULF OF MEXICO
STATE TRACTS 14, 64, 65, 80 & 81
JEFFERSON COUNTY, TX

This report accompanies a map of survey dated MAY 2019.



Figure 1: Typical shoreline along the Gulf of Mexico Shoreline of the McFaddin National Wildlife Refuge.

A coastal boundary survey was conducted along the Gulf of Mexico shoreline from the west end of the McFaddin Wildlife Refuge (the refuge) near High Island, Galveston County, Texas to the east boundary of the refuge at the border with Sea Rim State Park in Jefferson County, Texas. All survey work was performed using survey grade RTK GPS base and rover: Hemisphere S320 receivers. The survey was conducted May 1-3 & 23-24, 2019.

SURVEY CONTROL: Three NGS survey markers were used as primary control: "FADDEN" (AW5735, N:13,818,416.50, E: 3,519,789.40, EL: 2.4' NAVD88), "REBECCA 2" (AW2467, N:13,828,404.20, E:3,545,493.70, EL: 3.6' NAVD88 .and "877 0923 E" (DO9990, N: 13,765,402.04, E: 3,411,297.73, EL: 4.8') In addition to published NGS control, local temporary benchmarks were set in order to establish elevations on site. Positions were based on OPUS solutions.

Table 1: NGS benchmarks were used as primary control for the survey. Temporary benchmarks were set along the length of the project in order to accurately transfer and establish tidal datums during the littoral boundary survey.

	Northing	Easting	Elevation
NGS BENCHMARKS			
NGS 'FADDEN'	13,818,416.50	3,519,789.40	2.4'
NGS 'REBECCA 2'	13,828,404.20	3,545,493.70	3.6'
NGS '877 0923 E'	13,765,402.04	3,411,297.73	4.8'
LOCAL CONTROL (TEMPORARY BENCHMARKS)			
NMS CONTROL (3/4" GALV. IP/CAP)	13,776,219.90	3,434,047.10	4.5'
NMS CONTROL 1"GALV. IP W/ALUMINUM CAP "CP1"	13,784,262.32	3,449,966.02	4.8'
NMS TBM (3/4"GALV. IP/CAP)	13,795,667.80	3,474,010.50	5.7'
NMS TBM (3/4"GALV. IP/CAP)	13,799,709.11	3,482,013.97	9.1'
SET 1"GALV. IP W/ALUMINUM CAP "CP"	13,809,243.68	3,500,280.47	5.4'
SET 1"GALV. IP W/ALUMINUM CAP "CP2"	13,823,472.48	3,533,731.28	7.0'

Datum is NAD 83 (2011), South Central Zone of the Texas Coordinate System (US Feet). Orthometric height was calculated using geoid 2012b and is referenced to NAVD88 datum.



Figure 2: NGS benchmark "REBECCA 2" (N:13,828,404.20, E: 3,545,493.70, EL: 3.6')

TEXAS GENERAL LAND OFFICE
 Art. 33.136 Natural Resources Code
 Co. Jefferson, Sec. No. 13
 File Date 01/12/2021 by K. Schreiber



Figure 3: Typical TBM set during the survey was a 3/4" galvanized iron pipe with an aluminum cap stamped "NAISMITH MARINE SVCS CONTROL". "CP2" was set at the east end of the project (N:13,823,472.48, E: 3,533,731.28, EL: 7.0')



Figure 4: The west point of beginning of the MHW line (littoral boundary) was tied to a refuge corner which was marked by a round concrete monument (N:13,779,691.27, E: 3,438,951.82, EL: 3.0')

TEXAS GENERAL LAND OFFICE

Art. 33.136, Natural Resources Code

Co. Jefferson, SK No. 13

File Date 01/12/2021 by K. Schreiber McFaddin National Wildlife Refuge, Page 3



Figure 5: The east end point of the MHW line (littoral boundary) was tied to a refuge corner which was marked with a bronze TPWD monument set in a cast iron pipe (N:13,824,938.66, E: 3,533,646.37, EL: 2.9')

STATE OWNERSHIP BOUNDARY: As referenced to this survey, the elevation of MHW on the Gulf of Mexico shoreline is 1.5 feet (datum is NAVD88) as reported in a 2011 Coastal Boundary Survey of Rollover Pass by Naismith Marine Services. The tide gauge "Pleasure Pier" on Galveston Island and the, now removed, tide gauge "High Island" were used to establish MHW along the Gulf of Mexico beach.

EXISTING FILL: Apparent existing artificial fill remains in two places (Jefferson County Article 33.132 Sketch 1, 2002, and Sketch 12, 2017) within the survey area. In those portions of the current survey area the previously established MHW/littoral boundary lines are landward of the current (May, 2019) MHW line and these areas of artificial fill are described in this description. In all other portions of the survey area the MHW line has migrated landward as a result of normal erosion, including that portion where the MHHW line was previously surveyed (Jefferson County Article 33.132 Sketch 3, 2003). Pavement from destroyed State Highway 87 lies along portions of the McFaddin Gulf of Mexico shoreline. Artificial fill tracts are described hereinbelow.

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SK No. 13
File Date 01/12/2021 by K. Schreiber

TRACT 1 - BUILD UP / ARTIFICIAL FILL

FIELD NOTES for the boundary of a 19.05 acre tract of land, being an area of Build Up / Artificial Fill lying between the current (May, 2019) MHW line and the MHW line/littoral boundary established by Jefferson County NRC Article 33.136 Sketch 12 coastal boundary survey performed in 2017, along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge (the refuge), and being a part of Gulf of Mexico state tracts 64, 65, 80 & 81 in Jefferson County, Texas. Distances, bearings, and Coordinates are grid, North American Datum of 1983 (2011), South Central zone of the Texas coordinate system;

Beginning at a point on the southeast littoral boundary of the refuge where the current (May, 2019) MHW line intersects the MHW line established in 2017 (N: 13,794,587.24, E: 3,472,013.69, EL: 1.5'), for the southwest corner of this tract, from which NGS monument "877 0923 E" (N:13,765,402.04, E: 3,411,297.73, EL: 4.8'), bears S 64°19'38" W a distance of 67,366.19 feet (24,251.83V);

Thence along the MHW line as established in 2017, the southeast littoral boundary of the refuge and the northwest line of this tract the following courses:

N 62°50'34" E a distance of 85.55 feet (30.80V)
N 62°06'17" E a distance of 350.02 feet (126.01V);
N 62°10'35" E a distance of 321.94 feet (115.90V);
N 63°27'17" E a distance of 351.51 feet (126.54V);
N 61°31'19" E a distance of 335.48 feet (120.77V);
N 64°42'32" E a distance of 329.16 feet (118.50V);
N 64°22'24" E a distance of 352.70 feet (126.97V);
N 64°56'47" E a distance of 148.53 feet (53.47V) to a point on the MHW line established in 2017 (N:13,795,613.43, E: 3,474,043.39) from which a NMS TBM (3/4" galvanized iron pipe and cap, N:13,795,667.80, E: 3,474,010.50, EL: 5.7') bears N 31°10'27" E a distance of 63.55 feet (22.88V);

N 62°04'57" E a distance of 329.39 feet (119.58V);
N 62°50'45" E a distance of 369.74 feet (133.11V);
N 63°41'47" E a distance of 354.96 feet (127.79V);
N 62°53'20" E a distance of 362.16 feet (130.38V)
N 63°24'49" E a distance of 349.96 feet (125.99V);
N 62°27'32" E a distance of 312.91 feet (112.65V);
N 63°23'02" E a distance of 259.51 feet (93.42V);
N 63°13'21" E a distance of 348.12 feet (125.32V);
N 61°38'27" E a distance of 350.49 feet (126.18V);
N 62°15'15" E a distance of 366.44 feet (128.32V);
N 63°53'29" E a distance of 307.37 feet (110.65V);
N 63°06'51" E a distance of 358.68 feet (129.12V);
N 61°58'57" E a distance of 364.57 feet (131.25V);
N 61°36'09" E a distance of 334.63 feet (120.47V);
N 65°16'36" E a distance of 358.27 feet (128.98V);

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, sk. No. 13
File Date 01/12/2021 by K. Schreiber

N 65°13'13" E a distance of 341.33 feet (122.88V);
N 61°54'26" E a distance of 387.56 feet (139.52V);
N 62°47'51" E a distance of 413.29 feet (148.78V);
N 63°08'07" E a distance of 341.50 feet (122.94V);
N 62°47'59" E a distance of 402.86 feet (145.03V);
N 63°59'58" E a distance of 371.71 feet (133.82V);
N 64°53'51" E a distance of 444.60 feet (160.06V);
N 64°36'54" E a distance of 370.33 feet (133.32V)
N 64°23'34" E a distance of 334.57 feet (120.45V);
N 65°29'24" E a distance of 350.37 feet (126.13V) to a point on the MHW line established in 2017 (N:13,799,601.16, E: 3,481,981.62) from which a NMS TBM (3/4" galvanized iron pipe and cap, N:13,799,709.11, E: 3,482,013.97, EL: 9.1') bears N 16°41'08" E a distance of 112.69 feet (40.57V);

N 66°46'19" E a distance of 361.44 feet (130.12V);
N 64°57'30" E a distance of 105.80 feet (38.09V);
N 65°15'15" E a distance of 268.35 feet (96.61V);
N 63°06'39" E a distance of 137.90 feet (49.64V);
N 62°28'03" E a distance of 245.20 feet (88.27V);
N 61°47'51" E a distance of 102.53 feet (36.91V);
N 61°13'39" E a distance of 294.01 feet (105.84V);
N 60°24'08" E a distance of 85.36 feet (30.73V);
N 60°45'15" E a distance of 173.23 feet (62.36V);
N 62°50'57" E a distance of 284.49 feet (102.42V);
N 63°00'27" E a distance of 296.80 feet (106.85V);
N 62°26'06" E a distance of 260.02 feet (93.61V);
N 62°23'26" E a distance of 321.65 feet (115.79V);
N 63°18'58" E a distance of 289.95 feet (104.38V);
N 64°56'28" E a distance of 258.28 feet (92.98V)
N 63°50'00" E a distance of 300.35 feet (108.13V);
N 63°54'56" E a distance of 281.52 feet (101.35V);
N 62°00'01" E a distance of 302.51 feet (108.90V);
N 62°27'14" E a distance of 408.49 feet (147.06V);
N 62°07'23" E a distance of 353.75 feet (127.35V);
N 62°51'56" E a distance of 286.16 feet (103.02V);
N 64°11'45" E a distance of 443.32 feet (159.60V);
N 62°12'22" E a distance of 419.72 feet (151.10V);
N 64°43'34" E a distance of 422.66 feet (152.06V) to a point where the MHW line established in 2017 intersects the current (May, 2019) MHW line (N:13,802,619.05, E:3,487,965.03, EL: 1.5'), for the northeast corner of this tract, from which NGS monument "FADDEN" (N:13,818,416.50, E: 3,519,789.40, EL: 2.4') bears N 63°36'02" E a distance of 35,529.56 feet (12,790.64V);

Thence along the current (May, 2019) MHW line, the southeast limit of the artificial fill and the southeast line of this tract the following courses:

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SK No. 13
File Date 01/12/2021 by K. Schreiber

S 59°41'39" W a distance of 125.53 feet (45.19V);
 S 62°28'41" W a distance of 574.26 feet (206.74V);
 S 60°10'47" W a distance of 285.51 feet (102.78V);
 S 67°26'57" W a distance of 219.92 feet (79.17V);
 S 55°17'26" W a distance of 190.51 feet (68.58V);
 S 65°41'00" W a distance of 180.78 feet (65.08V);
 S 62°47'13" W a distance of 716.82 feet (258.05V);
 S 62°36'31" W a distance of 636.99 feet (229.32V);
 S 66°39'18" W a distance of 347.82 feet (125.21V);
 S 61°25'30" W a distance of 786.41 feet (283.11V);
 S 62°49'32" W a distance of 1,118.26 feet (402.57V);
 S 62°39'02" W a distance of 900.34 feet (324.12V);
 S 63°21'00" W a distance of 212.22 feet (76.40V);
 S 57°46'55" W a distance of 129.53 feet (46.63V);
 S 67°34'18" W a distance of 318.85 feet (114.79V);
 S 63°08'59" W a distance of 510.27 feet (183.70V);
 S 65°31'10" W a distance of 392.99 feet (141.48V);
 S 62°28'49" W a distance of 322.02 feet (115.93V);
 S 64°01'36" W a distance of 576.64 feet (207.59V);
 S 66°03'15" W a distance of 153.00 feet (55.08V);
 S 61°19'12" W a distance of 309.95 feet (111.58V);
 S 66°24'10" W a distance of 182.46 feet (65.69V);
 S 61°24'47" W a distance of 440.78 feet (158.68V);
 S 66°47'25" W a distance of 233.67 feet (84.12V);
 S 61°19'02" W a distance of 219.58 feet (79.05V);
 S 67°40'35" W a distance of 141.77 feet (51.04V);
 S 61°45'50" W a distance of 221.47 feet (79.73V);
 S 64°33'37" W a distance of 298.77 feet (107.56V);
 S 62°52'27" W a distance of 1,904.06 feet (685.46V);
 S 65°04'29" W a distance of 943.56 feet (339.68V);
 S 61°46'26" W a distance of 529.21 feet (190.51V);
 S 63°48'02" W a distance of 321.11 feet (115.60V);
 S 67°19'33" W a distance of 131.83 feet (47.46V);
 S 63°51'24" W a distance of 224.96 feet (80.98V);
 S 61°47'09" W a distance of 204.18 feet (73.50V);
 S 63°14'39" W a distance of 731.73 feet (263.42V);
 S 66°56'03" W a distance of 315.55 feet (113.60V);
 S 62°29'14" W a distance of 662.52 feet (238.51V);
 S 67°03'57" W a distance of 201.19 feet (72.43V);
 S 59°23'59" W a distance of 199.39 feet (71.78V);
 S 63°26'53" W a distance of 585.91 feet (210.93V);
 S 65°32'01" W a distance of 168.16 feet (60.54V) to the **Place of Beginning**, containing 19.05 acres of land, more or less.

TEXAS GENERAL LAND OFFICE
 Art. 33.136, Natural Resources Code
 Co. Jefferson, Sec. No. 13
 File Date 01/12/2021 by K. Schreiber

TRACT 2 - BUILD UP / ARTIFICIAL FILL

FIELD NOTES for the boundary of a 0.36 acre tract of land, being an area of Build Up / Artificial Fill lying between the current (May, 2019) MHW line and the MHW line/littoral boundary established by Jefferson County NRC Article 33.136 Sketch 1 coastal boundary survey performed in 2002, along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge (the refuge), and being a part of Gulf of Mexico state tract 14 in Jefferson County, Texas. Distances, bearings, and Coordinates are grid, North American Datum of 1983 (2011), South Central zone of the Texas coordinate system;

Beginning at a point (N:13,823,287.25 E: 3,533,742.01) on a southerly extension of the east line of the refuge, on the current MHW line of the Gulf of Mexico as established in 2019 and on the southeast limit of the artificial fill, for the southeast corner of this tract, from which a set 1" galvanized iron pipe with aluminum cap marked "CP2" (N:13,823,472.48, E: 3,533,731.28, EL:7.0') bears N 03°18'52" W a distance of 185.55 feet (66.80V), a bronze TPWD monument in cast iron pipe found (N:13,824,938.66, E:3,533,646.37, EL: 2.9') for a corner of the refuge bears N 03°18'52" W a distance of 1,654.19 feet (595.51V) and NGS monument "REBECCA 2" (N:13,828,404.20, E:3,545,493.70, EL: 3.6') bears N 66°28'14" E a distance of 12,817.39 feet (4614.26V).

Thence along the current (May, 2019) MHW line, the southeast limit of the artificial fill and the southeast line of this tract the following courses:

S 70°56'01" W a distance of 816.41 feet (293.91V) to a point (N:13,823,020.55, E:3,532,970.39, EL:1.5') common to the MHW line established in 2002;

S 71°19'38" W, departing said MHW line established in 2002, a distance of 112.43 feet (40.47V);

S 71°22'29" W a distance of 432.78 feet (155.80V) to a point on the southeast littoral boundary of the refuge where the current (May, 2019) MHW line intersects the MHW line established in 2002 (N: 13,822,846.34, E: 3,532,453.77, EL: 1.5') for the southwest corner of this tract, from which NGS monument "FADDEN" (N:13,818,416.50, E: 3,519,789.40, EL: 2.4') bears S 70°43'15" W a distance of 13,416.77 feet (4,830.04V);

Thence along the MHW line as established in 2002, the southeast littoral boundary of the refuge and the northwest line of this tract the following courses:

N 63°42'31" E a distance of 45.12 feet (16.24V);

N 68°50'47" E a distance of 100.00 feet (36.00V);

N 72°16'54" E a distance of 100.13 feet (36.05V);

N 73°59'35" E a distance of 100.32 feet (36.13V);

N 68°50'47" E a distance of 100.00 feet (36.00V);

N 76°15'43" E a distance of 100.72 feet (36.26V);

N 62°17'39" E a distance of 100.78 feet (36.28V);

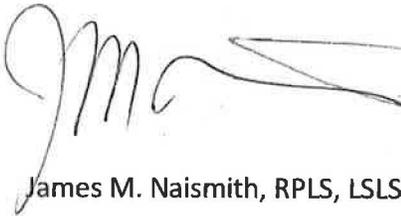
N 71°59'45" E a distance of 100.10 feet (36.04V);

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, Sk. No. 13
File Date 01/12/2021 by K. Schreiber

N 62°17'39" E a distance of 100.78 feet (36.28V);
N 78°13'48" E a distance of 101.19 feet (36.43V);
N 75°07'47" E a distance of 100.50 feet (36.18V);
N 67°07'43" E a distance of 100.08 feet (36.03V);
N 73°25'24" E a distance of 100.24 feet (36.09V);
N 64°50'43" E a distance of 100.32 feet (36.12V);

Thence N 72°51'10" E a distance of 22.45 feet (8.08V) to the north corner of this tract (N:13,823,308.40, E: 3,533,740.78) on an east line of the refuge and on the MHW line of the Gulf of Mexico as established in 2002;

Thence S 03°18'52" E along the east line of this tract, crossing said artificial fill, a distance of 21.19 feet (7.63V) to the **Place of Beginning**, containing 0.36 acre of land, more or less.



2/12/2020

James M. Naismith, RPLS, LSLS

Naismith Marine Services, Inc.

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SK No. 13
File Date 01/12/2021 by K. Schreiber

Naismith Marine Services, Inc.

www.naismithmarine.com

(361) 945-0248

FIRM #10078500



TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SK No. 13
File Date 01/12/2021 By K. Schreiber

MAY 2019

COASTAL BOUNDARY SURVEY OF A PORTION OF
McFADDIN NATIONAL WILDLIFE REFUGE ADJACENT TO GULF OF MEXICO
STATE TRACTS 14, 48-51, 62-66, 80-82, & 98-101
FROM HIGH ISLAND TO SEA RIM STATE PARK,
GALVESTON, CHAMBERS, & JEFFERSON COUNTIES, TX

This report accompanies a map of survey dated MAY 2019.

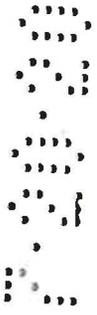


Figure 1: Typical shoreline along the Gulf of Mexico Shoreline of the McFaddin National Wildlife Refuge.

A coastal boundary survey was conducted along the Gulf of Mexico shoreline from the west end of the McFaddin Wildlife Refuge (the refuge) near High Island, Galveston County, Texas to the east boundary of the refuge at the border with Sea Rim State Park in Jefferson County, Texas. All survey work was performed using survey grade RTK GPS base and rover: Hemisphere S320 receivers. The survey was conducted May 1-3 & 23-24, 2019.

SURVEY CONTROL: Three NGS survey markers were used as primary control: "FADDEN" (AW5735, N:13,818,416.50, E: 3,519,789.40, EL: 2.4' NAVD88), "REBECCA 2" (AW2467, N:13,828,404.20, E:3,545,493.70, EL: 3.6' NAVD88 .and "877 0923 E" (DO9990, N: 13,765,402.04, E: 3,411,297.73, EL: 4.8') In addition to published NGS control, local temporary benchmarks were set in order to establish elevations on site. Positions were based on OPUS solutions.

Table 1: NGS benchmarks were used as primary control for the survey. Temporary benchmarks were set along the length of the project in order to accurately transfer and establish tidal datums during the littoral boundary survey.

	Northing	Easting	Elevation
NGS BENCHMARKS			
NGS 'FADDEN'	13,818,416.50	3,519,789.40	2.4'
NGS 'REBECCA 2'	13,828,404.20	3,545,493.70	3.6'
NGS '877 0923 E'	13,765,402.04	3,411,297.73	4.8'
LOCAL CONTROL (TEMPORARY BENCHMARKS)			
NMS CONTROL (3/4" GALV. IP/CAP)	13,776,219.90	3,434,047.10	4.5'
NMS CONTROL 1"GALV. IP W/ALUMINUM CAP "CP1"	13,784,262.32	3,449,966.02	4.8'
NMS TBM (3/4"GALV. IP/CAP)	13,795,667.80	3,474,010.50	5.7'
NMS TBM (3/4"GALV. IP/CAP)	13,799,709.11	3,482,013.97	9.1'
SET 1"GALV. IP W/ALUMINUM CAP "CP"	13,809,243.68	3,500,280.47	5.4'
SET 1"GALV. IP W/ALUMINUM CAP "CP2"	13,823,472.48	3,533,731.28	7.0'

Datum is NAD 83 (2011), South Central Zone of the Texas Coordinate System (US Feet). Orthometric height was calculated using geoid 2012b and is referenced to NAVD88 datum.



Figure 2: NGS benchmark "REBECCA 2" (N:13,828,404.20, E: 3,545,493.70, EL: 3.6')

TEXAS GENERAL LAND OFFICE
 Art. 33.136, Natural Resources Code

Co. Jefferson, S_{1/4} No. 13

File Date 01/12/2021 by K. Schreiber McFaddin National Wildlife Refuge, Page 2

96464



Figure 3: Typical TBM set during the survey was a 3/4" galvanized iron pipe with an aluminum cap stamped "NAISMITH MARINE SVCS CONTROL". "CP2" was set at the east end of the project (N:13,823,472.48, E: 3,533,731.28, EL: 7.0')



Figure 4: The west point of beginning of the MHW line (littoral boundary was tied to a refuge corner which was marked by a round concrete monument (N:13,779,691.27, E: 3,438,951.82, EL: 3.0')

TEXAS GENERAL LAND OFFICE

Art. 33.136, Natural Resources Code

Co. Jefferson, Sec. No. 13

McFaddin National Wildlife Refuge, Page 3

File Date 01/12/2021 by K. Schreiber



Figure 5: The east end point of the MHW line (littoral boundary) was tied to a refuge corner which was marked with a bronze TPWD monument set in a cast iron pipe (N:13,824,938.66, E: 3,533,646.37, EL: 2.9')

STATE OWNERSHIP BOUNDARY: As referenced to this survey, the elevation of MHW on the Gulf of Mexico shoreline is 1.5 feet (datum is NAVD88) as reported in a 2011 Coastal Boundary Survey of Rollover Pass by Naismith Marine Services. The tide gauge "Pleasure Pier" on Galveston Island and the, now removed, tide gauge "High Island" were used to establish MHW along the Gulf of Mexico beach.

EXISTING FILL: Apparent existing artificial fill remains in two places (Jefferson County Article 33.132 Sketch 1, 2002, and Sketch 12, 2017) within the survey area. In those portions of the current survey area the previously established MHW lines are landward of the current MHW line and are described and followed in this description. In all other portions of the survey area the MHW line has migrated landward as a result of normal erosion, including that portion where the MHHW line was previously surveyed (Jefferson County Article 33.132 Sketch 3, 2003). Pavement from destroyed State Highway 87 lies along portions of the McFaddin Gulf of Mexico shoreline.

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SIC No. 13
File Date 01/12/2021 by K. Schreiber

FIELD NOTES for a portion of the littoral boundary along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge (the refuge) adjacent to Gulf of Mexico state tracts 14, 48-51, 62-66, 80-82, & 98-101 in Galveston, Chambers, & Jefferson Counties, Texas. Distances, bearings, and Coordinates are grid, North American Datum of 1983 (2011), South Central zone of the Texas coordinate system;

Beginning at a point, (N:13,778,662.34, E: 3,439,451.37, EL. 1.5') on a west line of the refuge and the MHW (Mean High Water) line on the Gulf of Mexico shoreline; from which NMS TBM (3/4" galvanized iron pipe and cap, N:13,776,219.90, E: 3,434,047.10, EL: 4.5'), bears S 65°40'47" W a distance of 5,930.57 feet (2135.01V), a concrete monument found for a refuge corner (N:13,779,691.27, E: 3,438,951.82, EL: 3.0') bears N 25°53'50" W a distance of 1,143.79 feet (411.77V) and NGS monument "877 0923 E" (N:13,765,402.04, E: 3,411,297.73, EL: 4.8'), bears S 64°46'47" W a distance of 31,120.14 feet (11,203.25V).

Thence along the MHW line the following courses:

- N 66°13'15" E a distance of 324.90 feet (116.96V);
- N 67°55'10" E a distance of 366.42 feet (131.91V);
- N 65°00'20" E a distance of 671.45 feet (241.72V);
- N 63°43'19" E a distance of 568.56 feet (204.68V);
- N 67°16'58" E a distance of 280.33 feet (100.92V);
- N 64°41'59" E a distance of 674.88 feet (242.96V);
- N 62°41'06" E a distance of 395.07 feet (142.22V);
- N 66°23'54" E a distance of 261.33 feet (94.08V);
- N 60°11'42" E a distance of 171.73 feet (61.82V);
- N 65°54'45" E a distance of 356.77 feet (128.44V);
- N 62°22'03" E a distance of 476.93 feet (171.69V);
- N 70°06'01" E a distance of 59.35 feet (21.36V);
- N 60°06'45" E a distance of 412.83 feet (148.62V);
- N 67°36'58" E a distance of 156.19 feet (56.23V);
- N 61°54'03" E a distance of 288.45 feet (103.84V);
- N 64°37'26" E a distance of 994.47 feet (358.01V);
- N 59°55'08" E a distance of 81.52 feet (29.35V);
- N 63°55'38" E a distance of 863.82 feet (310.97V);
- N 65°15'24" E a distance of 279.87 feet (100.75V);
- N 69°56'52" E a distance of 140.43 feet (50.55V);
- N 62°29'43" E a distance of 265.77 feet (95.68V);
- N 68°44'47" E a distance of 167.75 feet (60.39V);
- N 64°08'47" E a distance of 299.28 feet (107.74V);
- N 61°40'59" E a distance of 191.29 feet (68.87V);
- N 65°09'17" E a distance of 307.23 feet (110.60V);
- N 61°14'46" E a distance of 121.76 feet (43.83V);
- N 66°09'13" E a distance of 382.60 feet (137.74V);
- N 61°45'14" E a distance of 144.40 feet (51.99V);
- N 65°51'23" E a distance of 297.12 feet (106.96V);
- N 61°15'59" E a distance of 206.89 feet (74.48V);



TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SK No. 13
File Date 01/12/2021 by K. Schreiber

N 64°25'41" E a distance of 482.09 feet (173.55V);
 N 62°21'16" E a distance of 247.09 feet (88.95V);
 N 58°38'01" E a distance of 91.08 feet (32.79V);
 N 65°29'02" E a distance of 209.09 feet (75.27V);
 N 59°45'11" E a distance of 169.40 feet (60.98V);
 N 66°50'30" E a distance of 110.43 feet (39.76V);
 N 60°33'29" E a distance of 254.38 feet (91.58V) to a point on the MHW line
 (N:13,783,781.71, E: 3,450,042.94, EL: 1.5') from which a set 1" galvanized iron pipe w/
 aluminum cap marked "CP1" (N:13,784,262.32, E: 3,449,966.02, EL: 4.8') bears N 09°05'35"
 W a distance of 486.73 feet (175.22V);

N 68°19'12" E a distance of 264.71 feet (95.30V);
 N 60°56'52" E a distance of 140.42 feet (50.55V);
 N 65°02'03" E a distance of 272.56 feet (98.12V);
 N 59°53'09" E a distance of 148.13 feet (53.33V);
 N 65°14'17" E a distance of 658.83 feet (237.18V);
 N 62°46'03" E a distance of 316.91 feet (114.09V);
 N 65°55'17" E a distance of 347.24 feet (125.01V);
 N 63°22'34" E a distance of 294.15 feet (105.90V);
 N 66°30'54" E a distance of 239.22 feet (86.12V);
 N 63°09'25" E a distance of 387.47 feet (139.49V);
 N 65°54'45" E a distance of 607.58 feet (218.73V);
 N 63°59'42" E a distance of 328.91 feet (118.41V);
 N 61°59'41" E a distance of 356.19 feet (128.23V);
 N 67°11'45" E a distance of 117.60 feet (42.34V);
 N 61°19'26" E a distance of 235.61 feet (84.82V);
 N 64°17'32" E a distance of 493.24 feet (177.57V);
 N 66°13'55" E a distance of 262.01 feet (94.32V);
 N 60°30'19" E a distance of 131.90 feet (47.48V);
 N 66°01'19" E a distance of 256.60 feet (92.38V);
 N 62°37'29" E a distance of 292.20 feet (105.19V);
 N 65°49'21" E a distance of 245.55 feet (88.40V);
 N 63°58'01" E a distance of 813.78 feet (292.96V);
 N 67°17'41" E a distance of 116.40 feet (41.90V);
 N 63°24'10" E a distance of 171.02 feet (61.57V);
 N 64°34'18" E a distance of 889.00 feet (320.04V);
 N 63°42'34" E a distance of 735.03 feet (264.61V);
 N 63°50'24" E a distance of 637.88 feet (229.64V);
 N 50°14'06" E a distance of 32.63 feet (11.75V);
 N 64°48'21" E a distance of 387.16 feet (139.38V);
 N 68°47'29" E a distance of 93.15 feet (33.54V);
 N 59°41'15" E a distance of 99.32 feet (35.76V);
 N 64°34'07" E a distance of 228.91 feet (82.41V);
 N 57°01'36" E a distance of 91.13 feet (32.81V);
 N 65°27'52" E a distance of 616.58 feet (221.97V);
 N 64°09'32" E a distance of 673.15 feet (242.33V);

TEXAS GENERAL LAND OFFICE
 Art. 33.136, Natural Resources Code
 Co. Jefferson, SIC 13
 File Date 01/12/2021 by K. Schreiber

N 61°59'37" E a distance of 288.52 feet (103.87V);
 N 63°55'07" E a distance of 335.29 feet (120.71V);
 N 62°42'54" E a distance of 640.56 feet (230.60V);
 N 63°04'38" E a distance of 1,266.55 feet (455.96V);
 N 64°51'46" E a distance of 390.13 feet (140.45V);
 N 62°04'30" E a distance of 268.00 feet (96.48V);
 N 63°19'13" E a distance of 572.53 feet (206.11V);
 N 64°06'06" E a distance of 252.97 feet (91.07V);
 N 58°44'36" E a distance of 129.88 feet (46.76V);
 N 62°53'58" E a distance of 767.99 feet (276.48V);
 N 64°17'20" E a distance of 290.06 feet (104.42V);
 N 64°06'55" E a distance of 352.09 feet (126.75V);
 N 62°30'13" E a distance of 630.52 feet (226.99V);
 N 62°59'24" E a distance of 1,261.98 feet (454.31V);
 N 62°29'30" E a distance of 559.30 feet (201.35V);
 N 64°27'14" E a distance of 1,288.60 feet (463.90V);
 N 63°30'14" E a distance of 973.92 feet (350.61V);
 N 64°35'37" E a distance of 845.80 feet (304.49V);
 N 62°04'37" E a distance of 528.59 feet (190.29V);
 N 62°51'14" E a distance of 509.12 feet (183.28V);
 N 65°32'01" E a distance of 358.74 feet (129.15V) to a point where the current MHW line crosses the MHW line established by Jefferson County NRC Article 33.136 Sketch 12 coastal boundary survey performed in 2017 (N: 13,794,587.24, E: 3,472,013.69, EL: 1.5');

Thence along the MHW line as established in 2017 the following courses:

N 62°50'34" E a distance of 85.55 feet (30.80V)
 N 62°06'17" E a distance of 350.02 feet (126.01V);
 N 62°10'35" E a distance of 321.94 feet (115.90V);
 N 63°27'17" E a distance of 351.51 feet (126.54V);
 N 61°31'19" E a distance of 335.48 feet (120.77V);
 N 64°42'32" E a distance of 329.16 feet (118.50V);
 N 64°22'24" E a distance of 352.70 feet (126.97V);
 N 64°56'47" E a distance of 148.53 feet (53.47V) to a point on the MHW line established in 2017 (N:13,795,613.43, E: 3,474,043.39) from which a NMS TBM (3/4" galvanized iron pipe and cap, N:13,795,667.80, E: 3,474,010.50, EL: 5.7') bears N 31°10'27" E a distance of 63.55 feet (22.88V);

N 62°04'57" E a distance of 329.39 feet (119.58V);
 N 62°50'45" E a distance of 369.74 feet (133.11V);
 N 63°41'47" E a distance of 354.96 feet (127.79V);
 N 62°53'20" E a distance of 362.16 feet (130.38V)
 N 63°24'49" E a distance of 349.96 feet (125.99V);
 N 62°27'32" E a distance of 312.91 feet (112.65V);
 N 63°23'02" E a distance of 259.51 feet (93.42V);
 N 63°13'21" E a distance of 348.12 feet (125.32V);

TEXAS GENERAL LAND OFFICE
 Art. 33.136, Natural Resources Code
 Co. Jefferson, SK No. 13
 File Date 01/12/2021 by K. Seiber

N 61°38'27" E a distance of 350.49 feet (126.18V);
 N 62°15'15" E a distance of 366.44 feet (128.32V);
 N 63°53'29" E a distance of 307.37 feet (110.65V);
 N 63°06'51" E a distance of 358.68 feet (129.12V);
 N 61°58'57" E a distance of 364.57 feet (131.25V);
 N 61°36'09" E a distance of 334.63 feet (120.47V);
 N 65°16'36" E a distance of 358.27 feet (128.98V);
 N 65°13'13" E a distance of 341.33 feet (122.88V);
 N 61°54'26" E a distance of 387.56 feet (139.52V);
 N 62°47'51" E a distance of 413.29 feet (148.78V);
 N 63°08'07" E a distance of 341.50 feet (122.94V);
 N 62°47'59" E a distance of 402.86 feet (145.03V);
 N 63°59'58" E a distance of 371.71 feet (133.82V);
 N 64°53'51" E a distance of 444.60 feet (160.06V);
 N 64°36'54" E a distance of 370.33 feet (133.32V)
 N 64°23'34" E a distance of 334.57 feet (120.45V);
 N 65°29'24" E a distance of 350.37 feet (126.13V) to a point on the MHW line established in
 2017 (N:13,799,601.16, E: 3,481,981.62) from which a NMS TBM (3/4"galvanized iron pipe
 and cap, N:13,799,709.11, E: 3,482,013.97, EL: 9.1') bears N 16°41'08" E a distance of 112.69
 feet (40.57V);



N 66°46'19" E a distance of 361.44 feet (130.12V);
 N 64°57'30" E a distance of 105.80 feet (38.09V);
 N 65°15'15" E a distance of 268.35 feet (96.61V);
 N 63°06'39" E a distance of 137.90 feet (49.64V);
 N 62°28'03" E a distance of 245.20 feet (88.27V);
 N 61°47'51" E a distance of 102.53 feet (36.91V);
 N 61°13'39" E a distance of 294.01 feet (105.84V);
 N 60°24'08" E a distance of 85.36 feet (30.73V);
 N 60°45'15" E a distance of 173.23 feet (62.36V);
 N 62°50'57" E a distance of 284.49 feet (102.42V);
 N 63°00'27" E a distance of 296.80 feet (106.85V);
 N 62°26'06" E a distance of 260.02 feet (93.61V);
 N 62°23'26" E a distance of 321.65 feet (115.79V);
 N 63°18'58" E a distance of 289.95 feet (104.38V);
 N 64°56'28" E a distance of 258.28 feet (92.98V)
 N 63°50'00" E a distance of 300.35 feet (108.13V);
 N 63°54'56" E a distance of 281.52 feet (101.35V);
 N 62°00'01" E a distance of 302.51 feet (108.90V);
 N 62°27'14" E a distance of 408.49 feet (147.06V);
 N 62°07'23" E a distance of 353.75 feet (127.35V);
 N 62°51'56" E a distance of 286.16 feet (103.02V);
 N 64°11'45" E a distance of 443.32 feet (159.60V);
 N 62°12'22" E a distance of 419.72 feet (151.10V);
 N 64°43'34" E a distance of 422.66 feet (152.06V);
 N 62°55'48" E a distance of 376.02 feet (135.37V);

TEXAS GENERAL LAND OFFICE
 Art. 33.136, Natural Resources Code
 Co. Jefferson, Sec. 13
 File Date 01/12/2021 by K. Seiber

N 63°05'48" E a distance of 223.38 feet (80.42V) to a point where the MHW line established in 2017 crosses the current MHW line (N: 13,802,891.24, E: 3,488,499.07, EL: 1.5');

Thence along the current (May, 2019) MHW line the following courses:

N 59°36'45" E a distance of 258.71 feet (93.14V);
N 63°21'21" E a distance of 441.54 feet (158.96V);
N 63°51'47" E a distance of 241.04 feet (86.77V);
N 60°37'00" E a distance of 477.92 feet (172.05V);
N 62°01'18" E a distance of 350.49 feet (126.18V);
N 65°05'55" E a distance of 825.09 feet (297.03V);
N 63°01'17" E a distance of 582.93 feet (209.85V);
N 63°25'55" E a distance of 1,251.46 feet (450.53V);
N 67°27'00" E a distance of 572.95 feet (206.26V);
N 60°10'24" E a distance of 287.81 feet (103.61V);
N 62°06'49" E a distance of 856.94 feet (308.50V);
N 60°40'39" E a distance of 745.21 feet (268.28V);
N 62°09'33" E a distance of 341.06 feet (122.78V);
N 70°57'13" E a distance of 131.83 feet (47.46V);
N 49°43'19" E a distance of 118.56 feet (42.68V);
N 61°53'41" E a distance of 498.65 feet (179.51V);
N 60°50'55" E a distance of 270.98 feet (97.55V);
N 64°50'27" E a distance of 574.78 feet (206.92V);
N 62°42'02" E a distance of 766.33 feet (275.88V);
N 64°55'45" E a distance of 438.78 feet (157.96V);
N 71°02'09" E a distance of 126.75 feet (45.63V);
N 60°57'31" E a distance of 512.30 feet (184.43V);
N 64°30'29" E a distance of 191.43 feet (68.92V);
N 60°07'19" E a distance of 211.42 feet (76.11V);
N 62°19'16" E a distance of 324.08 feet (116.67V);
N 66°35'03" E a distance of 117.76 feet (42.40V);
N 56°36'20" E a distance of 151.89 feet (54.68V);
N 71°44'24" E a distance of 138.80 feet (49.97V);
N 61°28'12" E a distance of 268.39 feet (96.62V);
N 65°34'33" E a distance of 273.07 feet (98.30V);
N 54°34'04" E a distance of 78.64 feet (28.31V);
N 63°47'56" E a distance of 336.09 feet (120.99V);
N 58°19'49" E a distance of 89.77 feet (32.32V);
N 69°19'42" E a distance of 125.01 feet (45.00V);
N 61°07'28" E a distance of 520.91 feet (187.53V) to a point on the MHW line (N:13,809,032.97, E: 3,500,501.37, EL: 1.5') from which a set 1" galvanized iron pipe with aluminum cap marked "CP" (N:13,809,243.68, E: 3,500,280.47, EL: 5.4') bears N 46°21'10" W a distance of 305.28 feet (109.90V);

N 81°53'50" E a distance of 94.79 feet (34.12V);
N 60°49'42" E a distance of 861.07 feet (309.99V);

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, 511 No. 13
File Date 01/12/2021 by K. Schreiber

N 66°36'21" E a distance of 269.94 feet (97.18V);
N 50°29'01" E a distance of 87.43 feet (31.47V);
N 64°16'21" E a distance of 537.77 feet (193.60V);
N 66°24'51" E a distance of 107.24 feet (38.61V);
N 51°14'04" E a distance of 58.17 feet (20.94V);
N 65°16'30" E a distance of 688.11 feet (247.72V);
N 63°25'53" E a distance of 1,063.01 feet (382.68V);
N 59°24'08" E a distance of 167.09 feet (60.15V);
N 65°17'11" E a distance of 576.44 feet (207.52V);
N 60°42'42" E a distance of 142.64 feet (51.35V);
N 66°00'06" E a distance of 628.16 feet (226.14V);
N 62°49'57" E a distance of 484.41 feet (174.39V);
N 63°40'07" E a distance of 584.54 feet (210.43V);
N 64°59'27" E a distance of 909.99 feet (327.60V);
N 62°42'04" E a distance of 745.63 feet (268.43V);
N 64°55'05" E a distance of 577.29 feet (207.82V);
N 64°18'37" E a distance of 1,149.65 feet (413.87V);
N 64°29'18" E a distance of 919.73 feet (331.10V);
N 65°37'51" E a distance of 1,207.76 feet (434.80V);
N 64°09'41" E a distance of 552.41 feet (198.87V);
N 67°01'54" E a distance of 277.58 feet (99.93V);
N 67°31'34" E a distance of 271.67 feet (97.80V);
N 61°31'44" E a distance of 202.97 feet (73.07V);
N 38°02'50" E a distance of 69.32 feet (24.96V);
N 65°08'13" E a distance of 164.40 feet (59.18V);
S 83°19'30" E a distance of 67.19 feet (24.19V);
N 62°26'25" E a distance of 220.33 feet (79.32V);
N 00°56'24"W a distance of 28.28 feet (10.18V);
N 59°15'58" E a distance of 71.34 feet (25.68V);
S 66°40'03" E a distance of 37.80 feet (13.61V);
N 68°49'33" E a distance of 184.39 feet (66.38V);
N 65°16'33" E a distance of 127.03 feet (45.73V);
N 67°28'36" E a distance of 208.40 feet (75.02V);
N 64°13'34" E a distance of 616.19 feet (221.83V);
N 65°39'11" E a distance of 329.11 feet (118.48V);
N 65°44'50" E a distance of 394.49 feet (142.02V);
N 67°52'28" E a distance of 440.08 feet (158.43V);
N 66°32'06" E a distance of 575.10 feet (207.04V);
N 67°10'14" E a distance of 669.68 feet (241.09V);
N 68°12'50" E a distance of 189.04 feet (68.05V);
N 70°50'44" E a distance of 87.99 feet (31.68V);
N 65°39'22" E a distance of 1,007.97 feet (362.87V);
N 69°02'13" E a distance of 216.20 feet (77.83V);
N 66°39'36" E a distance of 640.71 feet (230.66V);
N 63°13'32" E a distance of 228.60 feet (82.30V);
N 70°03'29" E a distance of 152.49 feet (54.90V);

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SR No. 13
File Date 01/12/2021 by K. Schreiber

N 66°13'11" E a distance of 511.82 feet (184.25V);
N 67°45'49" E a distance of 1,019.47 feet (367.01V) to a point on the MHW line
(N:13,818,030.86, E: 3,519,868.10, EL: 1.5') from which NGS monument "FADDEN"
(N:13,818,416.50, E: 3,519,789.40, EL: 2.4') bears N 11°32'05" W a distance of 393.59 feet
(141.69V);

N 67°49'59" E a distance of 1,447.58 feet (521.13V);
N 68°11'05" E a distance of 696.02 feet (250.57V);
N 68°38'36" E a distance of 859.34 feet (309.36V);
N 68°03'14" E a distance of 841.24 feet (302.85V);
N 67°30'45" E a distance of 1,176.09 feet (423.39V);
N 67°52'41" E a distance of 409.34 feet (147.36V);
N 68°41'40" E a distance of 399.70 feet (143.89V);
N 68°54'23" E a distance of 799.85 feet (287.95V);
N 69°05'08" E a distance of 742.02 feet (267.13V);
N 70°38'56" E a distance of 299.59 feet (107.85V);
N 64°00'59" E a distance of 155.76 feet (56.07V);
N 69°31'20" E a distance of 589.01 feet (212.04V);
N 69°43'46" E a distance of 1,179.44 feet (424.60V);
N 70°27'50" E a distance of 1,181.54 feet (425.36V);
N 70°01'31" E a distance of 933.03 feet (335.89V);
N 70°35'36" E a distance of 765.61 feet (275.62V);
N 70°33'34" E a distance of 778.09 feet (280.11V);
N 71°22'29" E a distance of 225.32 feet (81.12V) to a point where the current MHW line
crosses the MHW line established by Jefferson County NRC Article 33.136 Sketch 1 coastal
boundary survey performed in 2002 (N: 13,822,846.34, E: 3,532,453.77, EL: 1.5');

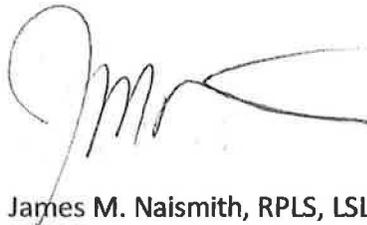
Thence along the MHW line as established in 2002 the following courses:

N 63°42'31" E a distance of 45.12 feet (16.24V);
N 68°50'47" E a distance of 100.00 feet (36.00V);
N 72°16'54" E a distance of 100.13 feet (36.05V);
N 73°59'35" E a distance of 100.32 feet (36.13V);
N 68°50'47" E a distance of 100.00 feet (36.00V);
N 76°15'43" E a distance of 100.72 feet (36.26V);
N 62°17'39" E a distance of 100.78 feet (36.28V);
N 71°59'45" E a distance of 100.10 feet (36.04V);
N 62°17'39" E a distance of 100.78 feet (36.28V);
N 78°13'48" E a distance of 101.19 feet (36.43V);
N 75°07'47" E a distance of 100.50 feet (36.18V);
N 67°07'43" E a distance of 100.08 feet (36.03V);
N 73°25'24" E a distance of 100.24 feet (36.09V);
N 64°50'43" E a distance of 100.32 feet (36.12V);

Thence N 72°51'10" E a distance of 22.45 feet (8.08V) to the **end point** (N:13,823,308.40

TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, Sec. No. 13
File Date 01/12/2021 by K. Schreiber

E: 3,533,740.78) on an east line of the refuge and on the MHW line of the Gulf of Mexico as established in 2002, from which a set 1" galvanized iron pipe with aluminum cap marked "CP2" (N:13,823,472.48, E: 3,533,731.28, EL:7.0') bears N 03°18'52" W a distance of 164.36 feet (59.17V), a bronze TPWD monument in cast iron pipe found (N:13,824,938.66, E:3,533,646.37, EL: 2.9') for a corner of the refuge bears N 03°18'52" W a distance of 1,633.00 feet (587.88V) and NGS monument "REBECCA 2" (N:13,828,404.20, E:3,545,493.70, EL: 3.6') bears N 66°33'34" E a distance of 12,810.08 feet (4611.63V).

 2/17/2020

James M. Naismith, RPLS, LSLS

Naismith Marine Services, Inc.



TEXAS GENERAL LAND OFFICE
Art. 33.136, Natural Resources Code
Co. Jefferson, SR No. 13
File Date 01/12/2021 by K. Schreiber