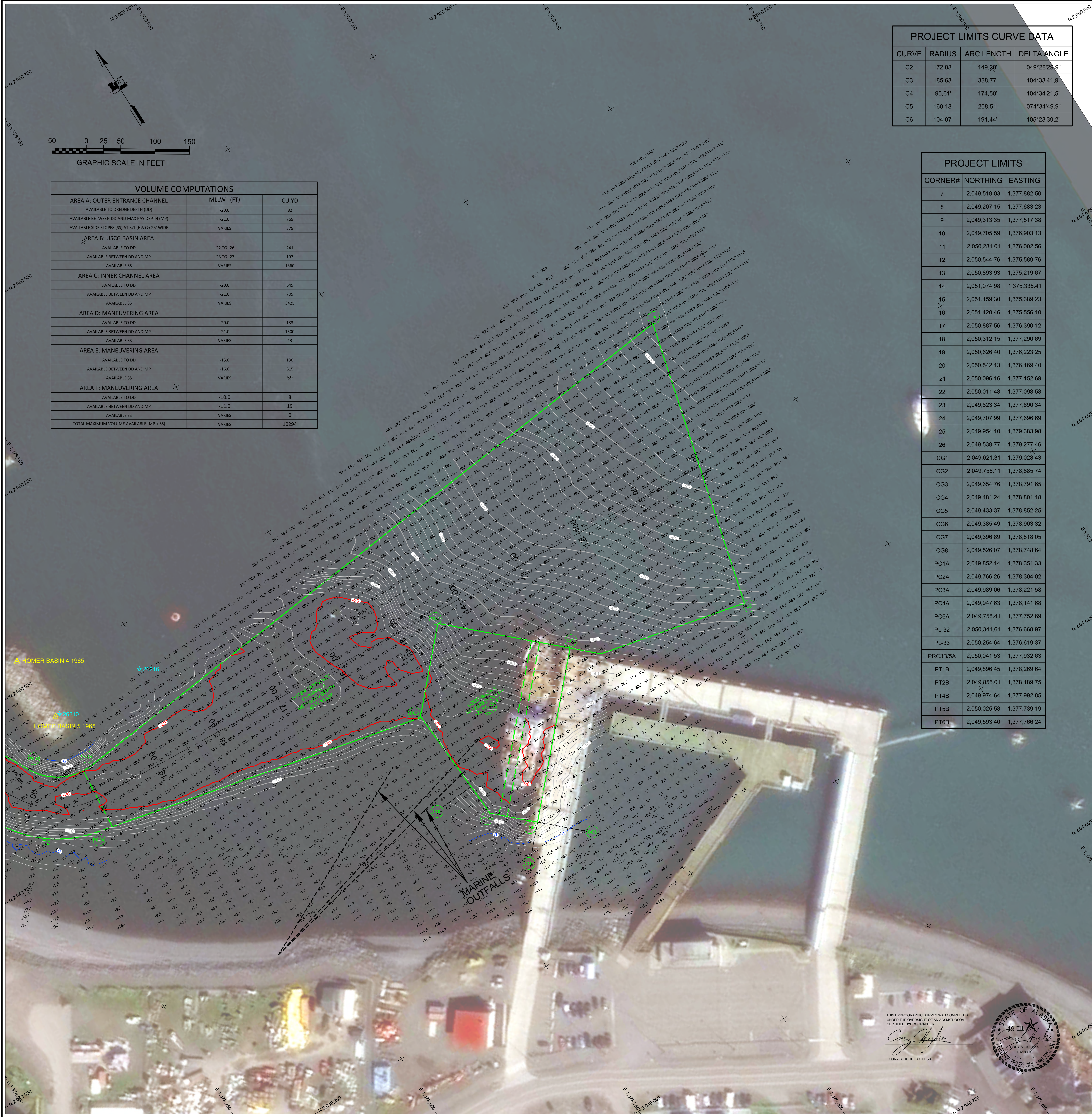




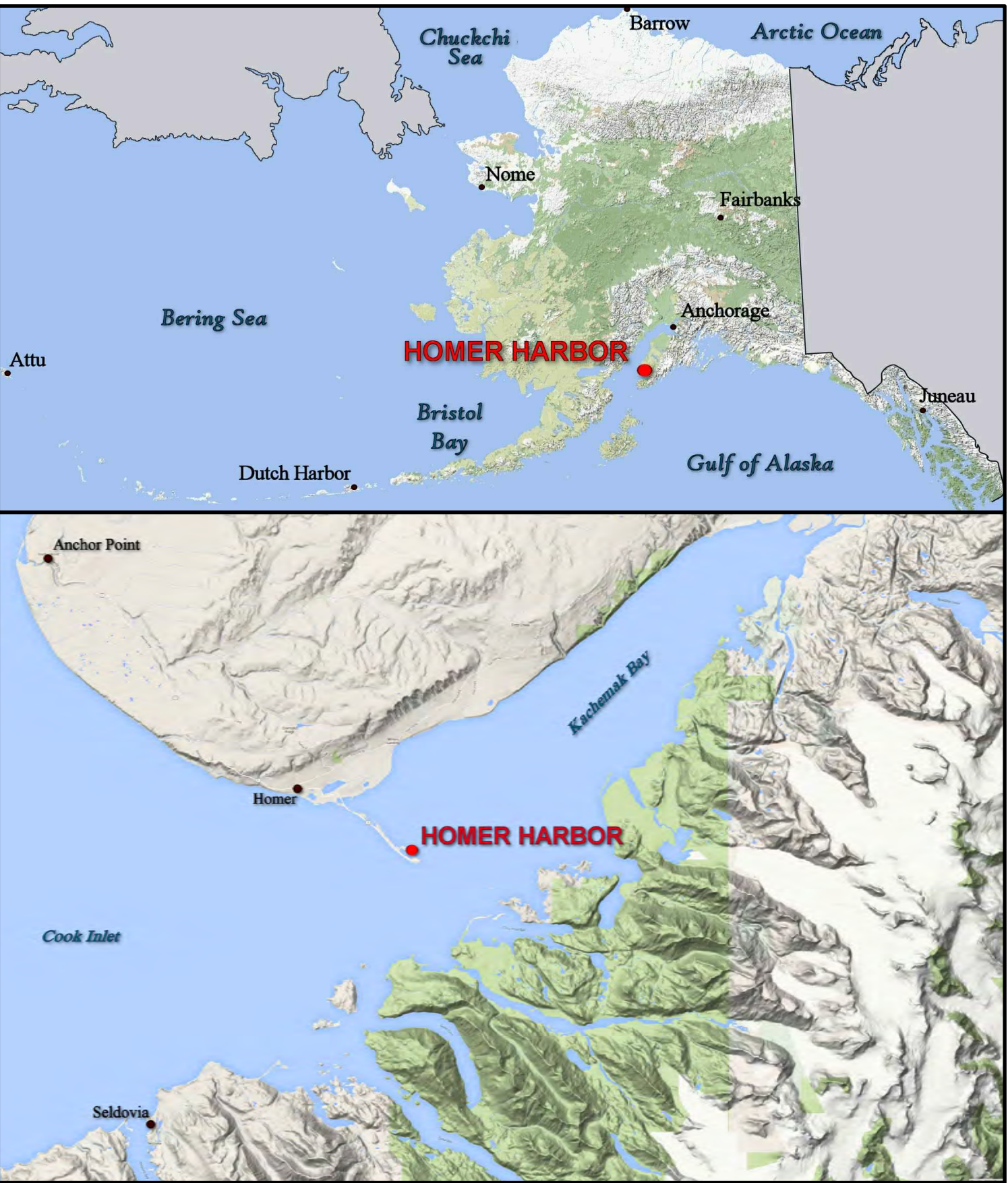
PROJECT LIMITS CURVE DATA			
CURVE	RADIUS	ARC LENGTH	DELTA ANGLE
C2	172.88'	149.28'	049°28'29.9"
C3	185.63'	338.77'	104°33'41.9"
C4	95.61'	174.50'	104°34'21.5"
C5	160.18'	208.51'	074°34'49.9"
C6	104.07'	191.44'	105°23'39.2"

PROJECT LIMITS		
CORNER#	NORTHING	EASTING
7	2,049,519.03	1,377,882.50
8	2,049,207.15	1,377,683.23
9	2,049,313.35	1,377,517.38
10	2,049,705.59	1,376,903.13
11	2,050,281.01	1,376,002.56
12	2,050,544.76	1,375,589.76
13	2,050,893.93	1,375,219.67
14	2,051,074.98	1,375,335.41
15	2,051,159.30	1,375,389.23
16	2,051,420.46	1,375,556.10
17	2,050,887.56	1,376,390.12
18	2,050,312.15	1,377,290.69
19	2,050,626.40	1,376,223.25
20	2,050,542.13	1,376,169.40
21	2,050,096.16	1,377,152.69
22	2,050,011.48	1,377,098.58
23	2,049,823.34	1,377,690.34
24	2,049,707.99	1,377,696.69
25	2,049,954.10	1,379,383.98
26	2,049,539.77	1,379,277.46
CG1	2,049,621.31	1,379,028.43
CG2	2,049,755.11	1,378,885.74
CG3	2,049,654.76	1,378,791.65
CG4	2,049,481.24	1,378,801.18
CG5	2,049,433.37	1,378,852.25
CG6	2,049,385.49	1,378,903.32
CG7	2,049,396.89	1,378,818.05
CG8	2,049,526.07	1,378,746.64
PC1A	2,049,852.14	1,378,351.33
PC2A	2,049,766.26	1,378,304.02
PC3A	2,049,989.05	1,378,221.58
PC4A	2,049,947.63	1,378,141.68
PC6A	2,049,758.41	1,377,752.69
PL-32	2,050,341.61	1,378,668.97
PL-33	2,050,254.64	1,376,619.37
PRC3B/5A	2,050,041.53	1,377,932.63
PT1B	2,049,896.45	1,378,269.64
PT2B	2,049,855.01	1,378,189.75
PT4B	2,049,974.64	1,377,992.85
PT5B	2,050,025.58	1,377,739.19
PT6B	2,049,593.40	1,377,766.24

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSMITH-SDA CERTIFIED HYDROGRAPHER

Cory S. Hughes

CORY S. HUGHES C.H. (048)



- NOTES**
- PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAVD83(2011) EPOCH VALUES OF NGS CORS STATIONS: "KENA1 CORS ARP" (KEN1 - PID DJ3029), "ANCHORAGE CORS ARP" (TSEA - PID A10952).
 - LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83, IN US SURVEY FEET HOLDING MONUMENT "HOMER BASIN 7 1965" AS N 2,049,712.22, E 1,377,964.36 AND USACE SBC "BL-2-A" AS N 2,049,765.61, E 1,378,015.52.
 - VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 ELEVATIONS HOLDING USACE STANDARD BRASS CAP "HOMER BASIN 7 1965" (PID BBDX21) AS 26.08'.
 - SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE NEGATIVE UNLESS OTHERWISE INDICATED.
 - BATHYMETRY WAS COLLECTED AUGUST 28, 2019. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2022 MULTIBEAM ECHOSOUNDER OPERATING AT 400 KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X2. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLIK POS MV SYSTEM. RTK CORRECTIONS WERE BROADCAST FROM A LOCAL BASE STATION OCCUPYING HOMER "BL-2-A". DATA WAS COLLECTED AND PROCESSED USING HYPACK 2019 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING RTK GNSS EQUIPMENT AND TECHNIQUES. TIDE ELEVATIONS WERE MEASURED USING A TRIMBLE R8 RTK SYSTEM.
 - THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
AUDREY	2,051,507.88	1,375,406.60	33.1	1-1/2 IN ALUMINUM CAP (FOUND)
BL-2-A 1989	2,049,793.81	1,378,015.52	32.35	USACE SBC (FOUND)
BM NO 6 1965			27.07	US&GC SBC (NOT FOUND)
BOLL 1996	2,050,682.88	1,375,195.75	35.3	3-1/4 IN FLAT BRASS CAP (FOUND)
C 103 1965			26.69	US&GC SBC (NOT FOUND)
HB-08 2009	2,050,150.78	1,377,830.73	31.7	3-1/4 IN DOMED ALUMINUM CAP (FOUND)
HB-09 2009	2,051,199.61	1,375,120.24	31.8	3-1/4 IN DOMED ALUMINUM CAP (FOUND)
HOMER BASIN 4 1965	2,050,038.11	1,378,340.09	31.1	USACE SBC (NOT SEARCH)
HOMER BASIN 5 1965	2,049,940.32	1,378,344.30	30.9	USACE SBC (FOUND, NOT GPS SUITABLE)
HOMER BASIN 6 1965	2,049,887.28	1,378,073.96	31.0	USACE SBC (FOUND)
HOMER BASIN 7 1965	2,049,712.22	1,377,964.36	31.31	USACE SBC (FOUND)

NAVIGATION AIDS				
USCG NO.	NORTHING	EASTING	DESCRIPTION	
26210	2,049,940	1,378,351	HOMER BREAKWATER LIGHT 2	
26216	2,049,932	1,378,484	SOUTH LIGHTED MOORING BUOY	
OBSTRUCTION IDENTIFIED IN 2015 SURVEY				
POINT	NORTHING	EASTING	APPROXIMATE DIMENSIONS	ELEVATION [FT MLLW]
OBST-1	2,049,999.55	1,378,206.74	7.0'x 3.7'x2.8'	-18
OBST-2	2,050,060.01	1,377,988.53	5.4'x 4.5'x1.7'	-19.7
OBST-3	2,049,935.22	1,378,201.00	4.9'x 2.8'x2.1'	-20.2
OBST-4	2,049,977.06	1,378,080.24	4.8'x 3.2'x2.6'	-16.9
OBSTRUCTION IDENTIFIED IN 2017 SURVEY				
POINT	NORTHING	EASTING	APPROXIMATE DIMENSIONS	ELEVATION [FT MLLW]
OBST-5	2,050,408.82	1,376,457.46	8.4'x 3.0'x1.6'	-14.2
OBST-6	2,050,281.55	1,376,791.11	9.2'x 7.1'x2.7'	-12.1
OBST-7	2,049,908.41	1,377,315.59	7.1'x3.2'x1.6'	-18.4
OBST-8	2,049,972.34	1,377,366.67	11.2'x 6.0'x.9'	-18.6
OBST-9	2,051,079.04	1,375,309.96	3.8'x 3.8'x2.6'	-9.3
OBST-10	2,050,751.35	1,375,979.40	3.8'x 2.7'x1.1'	-11.6
OBST-11	2,050,671.74	1,376,070.56	6.0'x 3.0'x1.7'	-10.9
OBST-12	2,049,862.17	1,378,295.83	8.4'x 5.7'x3.5'	-17.9
OBST-13	2,049,739.30	1,378,817.19	4.7'x 2.0'x2.6'	-17.5
OBST-14	2,049,827.53	1,378,786.35	7.3'x4.8'x3.4'	-17
OBST-15	2,050,655.65	1,376,121.46	3.5'x3.1'x1.2'	-11.7

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W11H817-C-0007

CONTINUATION: ALASKA MARINE EXCAVATION

CITY: ANCHORAGE

STATE: ALASKA

Recommended: _____

Approved: _____

Date: _____

DESIGNATION: _____

DATE: _____

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
JBER, ALASKA 99504-0888

HUGHES & ASSOCIATES
1001 E. COTTLE LOOP
WASILLA, ALASKA 99654

13 September 2019

CHECKED BY: _____

DRAWN BY: _____

APPROVED BY: _____

FILE NAME: _____

SIZE: _____

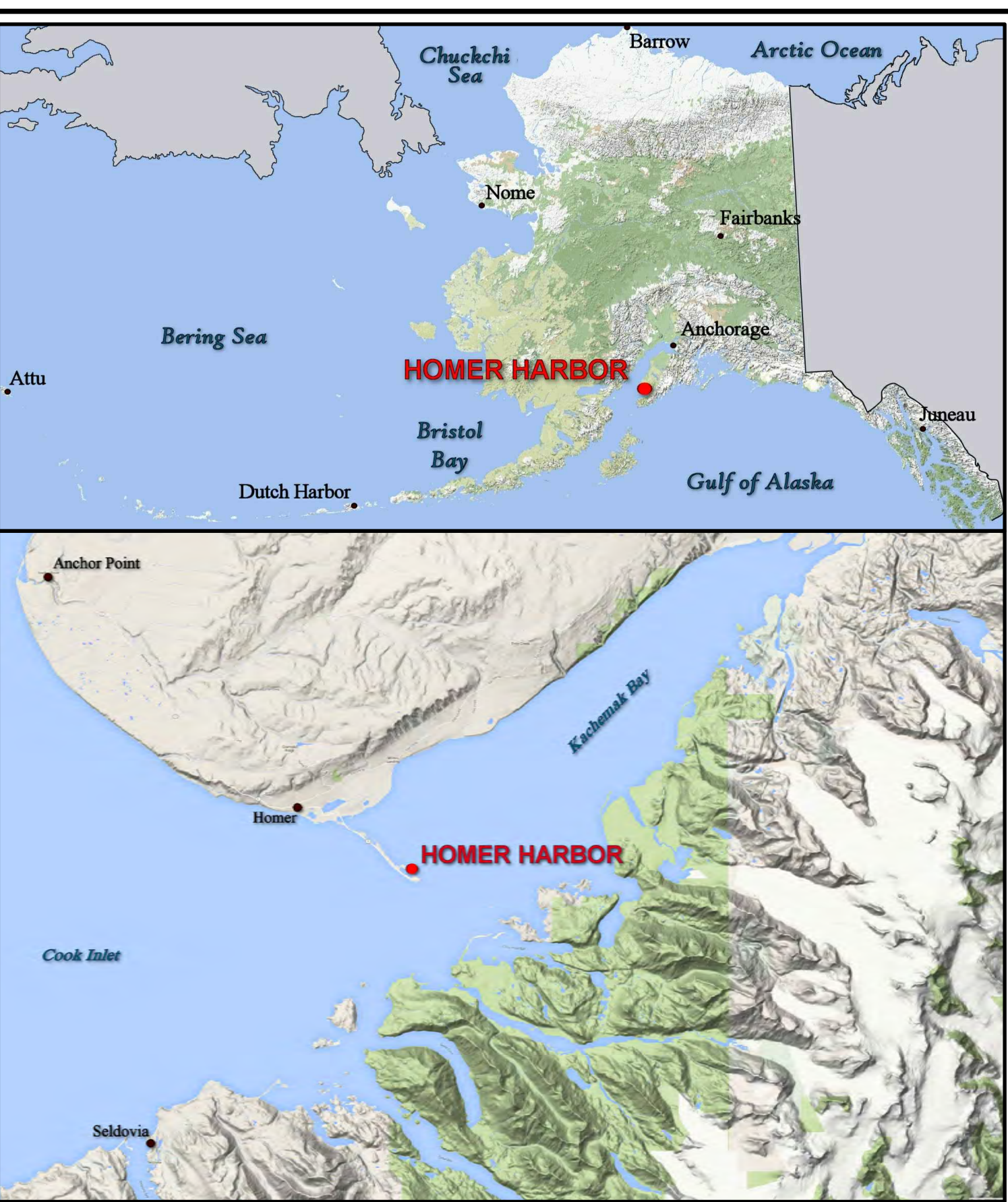
DATE: _____

HOMER, ALASKA
HOMER HARBOR
PRE DREDGE SURVEY
AUGUST 27 - 28, 2019

SHEET IDENTIFICATION

2-HOM-92-07-69

Sheet 1 of 6



1. PRIMARY PROJECT HORIZONTAL CONTROL, IS ALASKA STATE PLANE, ZONE 4, NAD83 IN US SURVEY FEET BASED ON A FULLY CONstrained STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83(CORS) 2003.00 DATUM. THE NAME OF THE CORS STATIONS: "KEMU 5 CORS ARP" (KEM5 - PDJ0529), "ANCHORAGE CORS ARP" (TSEA - PDJ A0952).

2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83, IN US SURVEY FEET HOLDING MONUMENT "HOMER BASIN 7 1965" AS N 249,117.72, E 1,377,964.36 AND USACE SBSC "BL-2A" AS N 249,117.72, E 1,378,000.00.

3. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW) DATED 01/07/22, BASED ON THE NOAA'S TIDAL BENCH MARK LIST FOR STATION "945 5556, COAL TIDAL POOL, KACHEMAK BAY, ALASKA, PUBLISHED 04/10/2019". THIS TIDAL DATUM IS BASED ON THE 2012-2016 TIDAL EPOCH AND IS REFERENCED BY HOLDING SBSC "BM NO 6 1965 AS 257.07".

4. VERTICAL TIE TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAD83 ELEVATIONS HOLDING "GSA STANDARD BRASS CAP "HOMER BASIN 7 1965" (PDJ BRD20) AS 26.09".

5. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE NEGATIVE UNLESS OTHERWISE INDICATED.

6. BATHYMETRY WAS COLLECTED AUGUST 26, 2018. SOUNDINGS WERE COLLECTED USING AN RS203IC 2022 C-CLASS CHIRP SONAR OPERATING AT 1200 kHz. TELEMETRY DATA FROM THE WATER COLUMN WAS DETERMINED WITH AN AML BASE 2C POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLINK POS MV SYSTEM. RTK CORRECTIONS WERE BROADCAST FROM A LOCAL BASE STATION TO THE "HOMER BL-2A" WHICH WAS COLLECTED AND PROCESSED USING HYPACK 2014 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING RTK GNSS EQUIPMENT AND TECHNIQUES. TIDE ELEVATIONS WERE MEASURED USING A TRIMBLE RB RTK SYSTEM.

7. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

8. MAP SOUNDINGS, CONTOURS AND COLOR RELIEF ARE BINNED AT 15 FEET AND ARE SHOAL-BIASED ON THE CENTER. VOLUME SOUNDINGS ARE BINNED AT 3 FEET AND ARE MEAN VALUE SOUNDINGS ON CELL CENTERS.

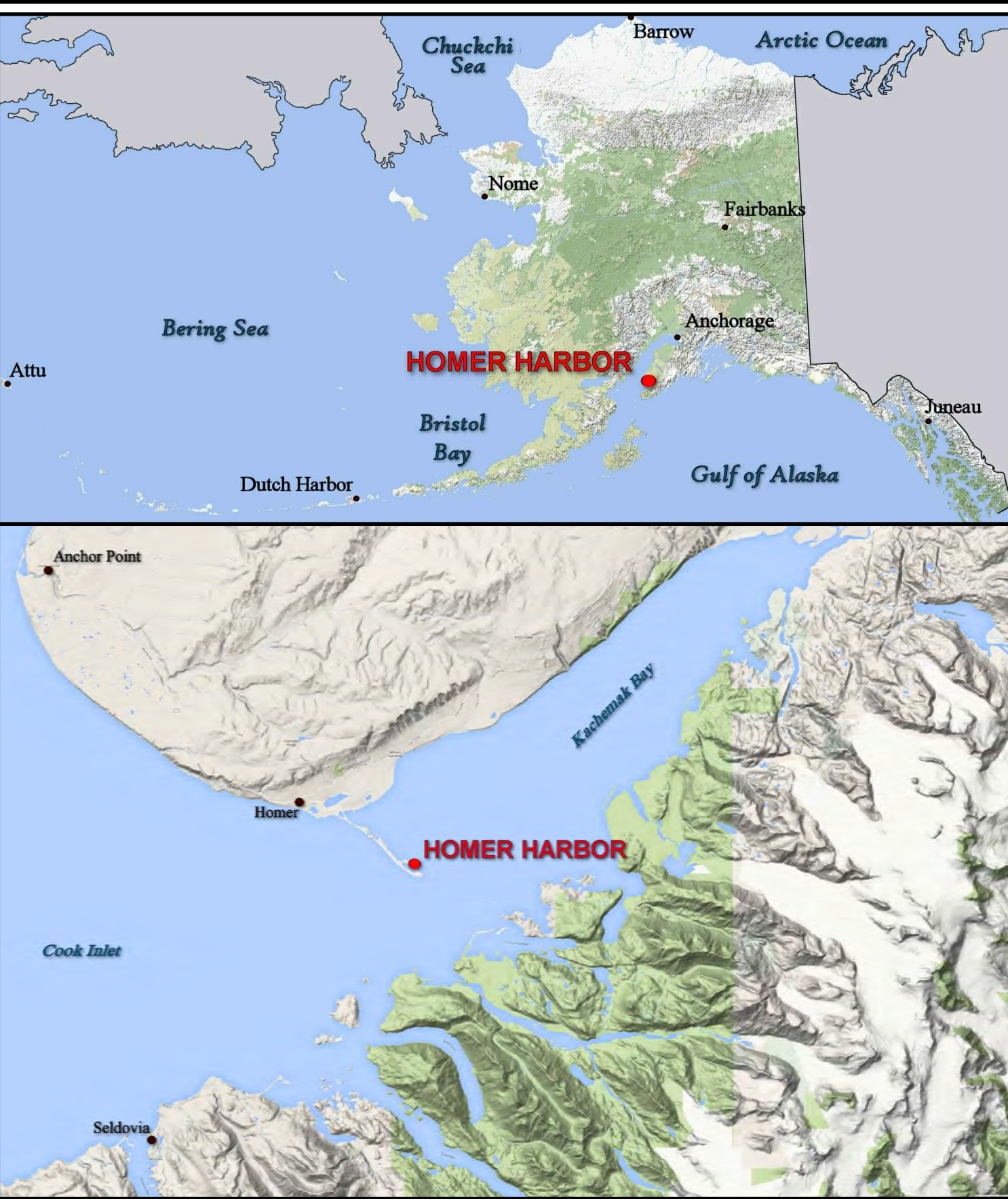
SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
AUDREY	2,051,507.88	1,375,406.60	33.1	1-1/2 IN ALUMINUM CAP (FOUND)
BL-2-A 1989	2,049,793.81	1,378,015.52	32.35	USACE SBC (FOUND)
BM NO 6 1965			27.07	USC&GC SBC (NOT FOUND)
BOLL 1996	2,050,682.88	1,375,195.75	35.3	3-1/4 IN FLAT BRASS CAP (FOUND)
C 103 1965			26.69	USC&GC SBC (NOT FOUND)
HB-08 2009	2,050,150.78	1,377,830.73	31.7	3-1/4 IN DOMED ALUMINUM CAP (FOUND)
HB-09 2009	2,051,199.61	1,375,120.24	31.8	3-1/4 IN DOMED ALUMINUM CAP (FOUND)
HOMER BASIN 4 1965	2,050,038.11	1,378,340.09	31.1	USACE SBC (NOT SEARCH)
HOMER BASIN 5 1965	2,049,940.32	1,378,344.30	30.9	USACE SBC (FOUND, NOT GPS SUITABLE)
HOMER BASIN 6 1965	2,049,887.28	1,378,073.96	31.0	USACE SBC (FOUND)
HOMER BASIN 7 1965	2,049,712.22	1,377,964.36	31.31	USACE SBC (FOUND)

NAVIGATION AIDS			
USCG NO.	NORTHING	EASTING	DESCRIPTION
26210	2,049,940	1,378,351	HOMER BREAKWATER LIGHT 2
26216	2,049,932	1,378,484	SOUTH LIGHTED MOORING BUOY

OBSTRUCTION IDENTIFIED IN 2015 SURVEY				
POINT	NORTHING	EASTING	APPROXIMATE DIMENSIONS	ELEVATION [FT MLLW]
OBST-1	2,049,999.55	1,378,206.74	7.0'x 3.7'x2.8'	-18
OBST-2	2,050,060.01	1,377,988.53	5.4'x 4.5'x1.7'	-19.7
OBST-3	2,049,935.22	1,378,201.00	4.9'x 2.8'x2.1'	-20.2
OBST-4	2,049,977.06	1,378,080.24	4.8'x 3.2'x2.6'	-16.9

OBSTRUCTION IDENTIFIED IN 2017 SURVEY				
POINT	NORTHING	EASTING	APPROXIMATE DIMENSIONS	ELEVATION [FT MLW]
OBST-5	2,050,408.82	1,376,457.46	8.4'x 3.0'x1.6'	-14.2
OBST-6	2,050,281.55	1,376,791.11	9.2'x 7.1'x2.7'	-12.1
OBST-7	2,049,908.41	1,377,315.59	7.1'x3.2'x1.6'	-18.4
OBST-8	2,049,972.34	1,377,366.67	11.2'x 6.0'x.9'	-18.6
OBST-9	2,051,079.04	1,375,309.96	3.8'x 3.8'x2.6'	-9.3
OBST-10	2,050,751.35	1,375,979.40	3.8'x 2.7'x1.1'	-11.6
OBST-11	2,050,671.74	1,376,070.56	6.0'x 3.0'x1.7'	-10.9
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OBST-14	2,049,827.53	1,378,786.35	7.3'x4.8'x3.4'	-17.1
OBST-15	2,050,655.65	1,376,121.46	3.5'x3.1'x1.2'	-11.7

[illegible]



- NOTES**
1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83(CORS) 2003.00 EPOCH VALUES OF NGS CORS STATIONS: *KENAI 5 CORS ARP* (KEN5 - PID DJ3029), *ANCHORAGE CORS ARP* (TSEA - PID A0952).
 2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83, IN US SURVEY FEET HOLDING MONUMENT "HOMER BASIN 7 1965" AS N 2,049,712.22, E 1,377,964.36 AND USACE SBC "BL-2-A" AS N 2,049,763.61, E 1,378,015.52.
 3. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 ELEVATIONS HOLDING USACE STANDARD BRASS CAP "HOMER BASIN 7 1965" (PID BBDX21) AS 26.08'.
 4. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE NEGATIVE UNLESS OTHERWISE INDICATED.
 5. BATHYMETRY WAS COLLECTED AUGUST 28, 2019. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2022 MULTIBEAM ECHOSOUNDER OPERATING AT 400 KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X2. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLINK POS MV SYSTEM. RTK CORRECTIONS WERE BROADCAST FROM A LOCAL BASE STATION OCCUPYING HOMER "BL-2-A". DATA WAS COLLECTED AND PROCESSED USING HYPACK 2019 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING RTK GNSS EQUIPMENT AND TECHNIQUES. TIDE ELEVATIONS WERE MEASURED USING A TRIMBLE R8 RTK SYSTEM.
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SURVEY CONTROL DATA				
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HOMER BASIN 5 1965	2,049,940.32	1,378,344.30	30.9	USACE SBC (FOUND, NOT GPS SUITABLE)
HOMER BASIN 6 1965	2,049,887.28	1,378,073.96	31.0	USACE SBC (FOUND)
HOMER BASIN 7 1965	2,049,712.22	1,377,964.36	31.31	USACE SBC (FOUND)

NAVIGATION AIDS			
USCG NO.	NORTHING	EASTING	DESCRIPTION
26210	2,049,940	1,378,351	HOMER BREAKWATER LIGHT 2
26216	2,049,932	1,378,484	SOUTH LIGHTED MOORING BUOY

OBSTRUCTION IDENTIFIED IN 2015 SURVEY				
POINT	NORTHING	EASTING	APPROXIMATE DIMENSIONS	ELEVATION [FT MLLW]
OBST-1	2,049,999.55	1,378,206.74	7.0'x 3.7'x2.8'	-18
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OBSTRUCTION IDENTIFIED IN 2017 SURVEY				
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OBST-15	2,050,655.65	1,376,121.46	3.5'x3.1'x1.2'	-11.7

VOLUME COMPUTATIONS		
AREA A: OUTER ENTRANCE CHANNEL	MLLW (FT)	CU.YD
AVAILABLE TO DREDGE DEPTH (DD)	-20.0	82
AVAILABLE BETWEEN DD AND MAX PAY DEPTH (MP)	-21.0	769
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	379
AREA B: USCG BASIN AREA		
AVAILABLE TO DD	-22.0 - 26	241
AVAILABLE BETWEEN DD AND MP	-23.0 - 27	197
AVAILABLE SS	VARIES	1360
AREA C: INNER CHANNEL AREA		
AVAILABLE TO DD	-20.0	649
AVAILABLE BETWEEN DD AND MP	-21.0	709
AVAILABLE SS	VARIES	3425
AREA D: MANEUVERING AREA		
AVAILABLE TO DD	-20.0	133
AVAILABLE BETWEEN DD AND MP	-21.0	1500
AVAILABLE SS	VARIES	13
AREA E: MANEUVERING AREA		
AVAILABLE TO DD	-15.0	136
AVAILABLE BETWEEN DD AND MP	-16.0	615
AVAILABLE SS	VARIES	59
AREA F: MANEUVERING AREA		
AVAILABLE TO DD	-10.0	8
AVAILABLE BETWEEN DD AND MP	-11.0	19
AVAILABLE SS	VARIES	0
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)	VARIES	10294

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THORGA CERTIFIED HYDROGRAPHER

Cory Hughes

CORY B. HUGHES C.M. (245)



US Army Corps of Engineers - ALASKA DISTRICT

CONTRACT NO. W01H017-2-0007

CITY: ANCHORAGE STATE: ALASKA

APPROVED: _____ DATE: _____

RECOMMENDED: _____

DESIGNATION: _____

DATE: _____

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
JBER, ALASKA 99504-0888

HUGHES & ASSOCIATES
HYDROGRAPHIC ENGINEERING
WASILLA, ALASKA 99654

**HOMER, ALASKA
HOMER HARBOR
PRE DREDGE SURVEY
AUGUST 27 - 28, 2019**

SHEET IDENTIFICATION

2-HOM-92-07-69

Sheet 3 of 6