

- NOTES**
1. PRIMARY PROJECT HORIZONTAL CONTROL POINT IS ALASKA STATE PLANE, ZONE 4, NAD83 AND NA2011 EPOCH 2010.0. SURVEY FEET BASED ON A FULLY ADJUSTED NGCS NETWORK-HOLDING THE PUBLISHED NGCS STATIONS "VAN DUSEN" (PUD T14746) AND "LOOP 2 RM 3" (N 4406) AND INCLUDED NGCS CORS STATIONS "ANZC" (PUD D16488), "TBON" (PUD D04055), "TSEA" (PUD A0952), "ZAND" (PUD D9153).  
  
LOCAL PROJECT HORIZONTAL CONTROL POINT IS ALASKA STATE PLANE, ZONE 4, NAD83. IN SURVEY FEET HOLDING USACE "TERRA 11" IN S 2644.969.94 E, 1.1680, 159.25.
  2. VERTICAL CONTROL, IS A TILTED-PLANE MLLW DATUM DERIVED IN 2013 AND BASED ON THE NOAA/NOS TIDAL BENCH MARK LISTS "9455920, ANCHORAGE, KNICK ARM, COOK INLET, ALASKA" PUBLISHED 10/24/2001, "9455912, FIRE ISLAND, ALASKA" PUBLISHED 05/21/2004, AND "9455934, PORT MACKENZIE, ALASKA" PUBLISHED 05/21/2004. THE TILTED-PLANE MLLW IS BASED ON THE 1984-2001 TIDAL EPOCH AT THOSE STATIONS AND IS REFERENCED BY HOLDING GPS CONTROL STATION "TERRA 11" (PUD B0C104) AS 80.48 FT.
  3. VERTICAL TIES TO THE NATIONAL SPATIAL SURVEYING SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 12B) ELEVATIONS HOLDING "TIDAL 16" (PUD T107133/MH1335) AS 29.78 FT.
  4. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
  5. BATHYMETRY WAS COLLECTED MAY 01, 2019, BY ETAC INC. SOUNDINGS WERE COLLECTED USING AN RSONIC 2024 MULTIBeam ECHOSOUNDER OPERATING AT 200 KHZ WITH A 120-DEGREE SWATH-WIDTH WITH A 1.0° BEAM-WIDTH. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED USING AN ANA-SP-3000 SOUND VELOCITY MEASUREMENT SYSTEM LOCATED AT THE SOUNDER HEAD USING A VALPSORT MINS. POSITIONING, VESSEL ATTITUDE, AND RTK TIDES WERE PROVIDED IN REAL TIME USING AN APPLANIX POSMV IMV V5 WAVEMASTER POSITIONING SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SP5855 RECEIVER SET AT CONTROL. "TERRA 11" LOCATED AT THE PORT OFFICE BUILDING, POST-PROCESS KINEMATIC CORRELATION USING POSPAC MMS 8.2 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL NAVIGATION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING GPS INTEGRATED SOFTWARE.
  6. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
  7. MAP SOUNDINGS ARE BINNED AT 48 FEET (SHOAL-BIASED), COLOR ELEVATIONS ARE BINNED AT 12 FEET (MAP-BIASED). VOLUME SOUNDINGS ARE BINNED AT 3 FEET (MEAN VALUE).

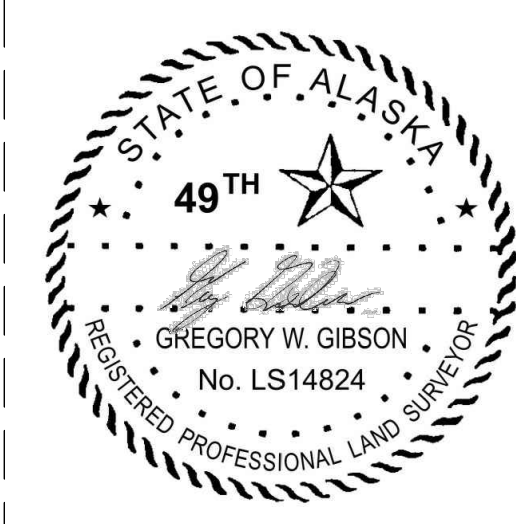
SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
5920 THERMO 1 1988	2,642,784.70	1,660,183.87	37.3	AL MON (DISTURBED)
BM 12 1974	2,620,563.82	1,604,566.35	27.63	BRASS CAP
BM 5934 F	2,655,203.73	1,655,049.51	36.48	BRASS CAP
CRAIG	2,642,635.95	1,661,028.47	44.73	BRASS CAP
ETRAC-1	2,646,395.57	1,660,814.72	38.22	BRASS CAP
ETRAC-2	2,644,443.04	1,660,120.66	36.31	BRASS CAP
MIKE	2,645,987.73	1,661,875.48	48.38	BRASS CAP
NORTH END	2,646,649.84	1,660,584.80	41.51	USACE SBC
PORT 1989	2,639,934.29	1,656,925.43	39.64	AL MON
PORT MAC	2,655,563.46	1,654,968.22	41.51	BRASS CAP
RIFE 1960	2,620,502.19	1,604,162.70	29.99	BRASS CAP
SOUTH END	2,644,296.27	1,659,728.03	40.57	USACE SBC
TERRA 11 ARP	2,644,969.84	1,660,159.24	80.48	GPS ANTENNA REFERENCE POINT
TERRA 12 ARP	2,644,990.65	1,660,166.56	81.21	GPS ANTENNA REFERENCE POINT

DREDGE LIMITS		
CORNER#	NORTHING	EASTING
DL-28	2,632,288.21	1,628,921.02
DL-29	2,633,360.88	1,628,352.82
DL-30	2,628,708.65	1,619,570.25
DL-31	2,627,635.79	1,620,138.09
DS-5	2,626,323.49	1,614,048.61


DREDGE LIMITS		
CORNER#	NORTHING	EASTING
DS-6	2,626,323.49	1,616,673.28
DS-7	2,624,354.99	1,616,673.28
DS-8	2,624,354.99	1,614,619.08
DS-9	2,624,587.68	1,614,048.61

SURVEY LIMITS		
CORNER#	NORTHING	EASTING
SL-20	2,628,562.99	1,619,081.63
SL-21	2,627,313.36	1,619,743.03
SL-22	2,632,899.16	1,630,288.87
SL-23	2,634,148.83	1,629,627.56

SURVEY LIMITS		
CORNER#	NORTHING	EASTING
SL-24	2,626,423.49	1,613,948.61
SL-25	2,624,254.99	1,613,948.61
SL-26	2,624,254.99	1,616,773.28
SL-27	2,626,423.49	1,616,773.28



THIS HYDROGRAPHIC SURVEY WAS COMPLETED  
UNDER THE OVERSIGHT OF AN NSPS/THSOA  
CERTIFIED HYDROGRAPHER

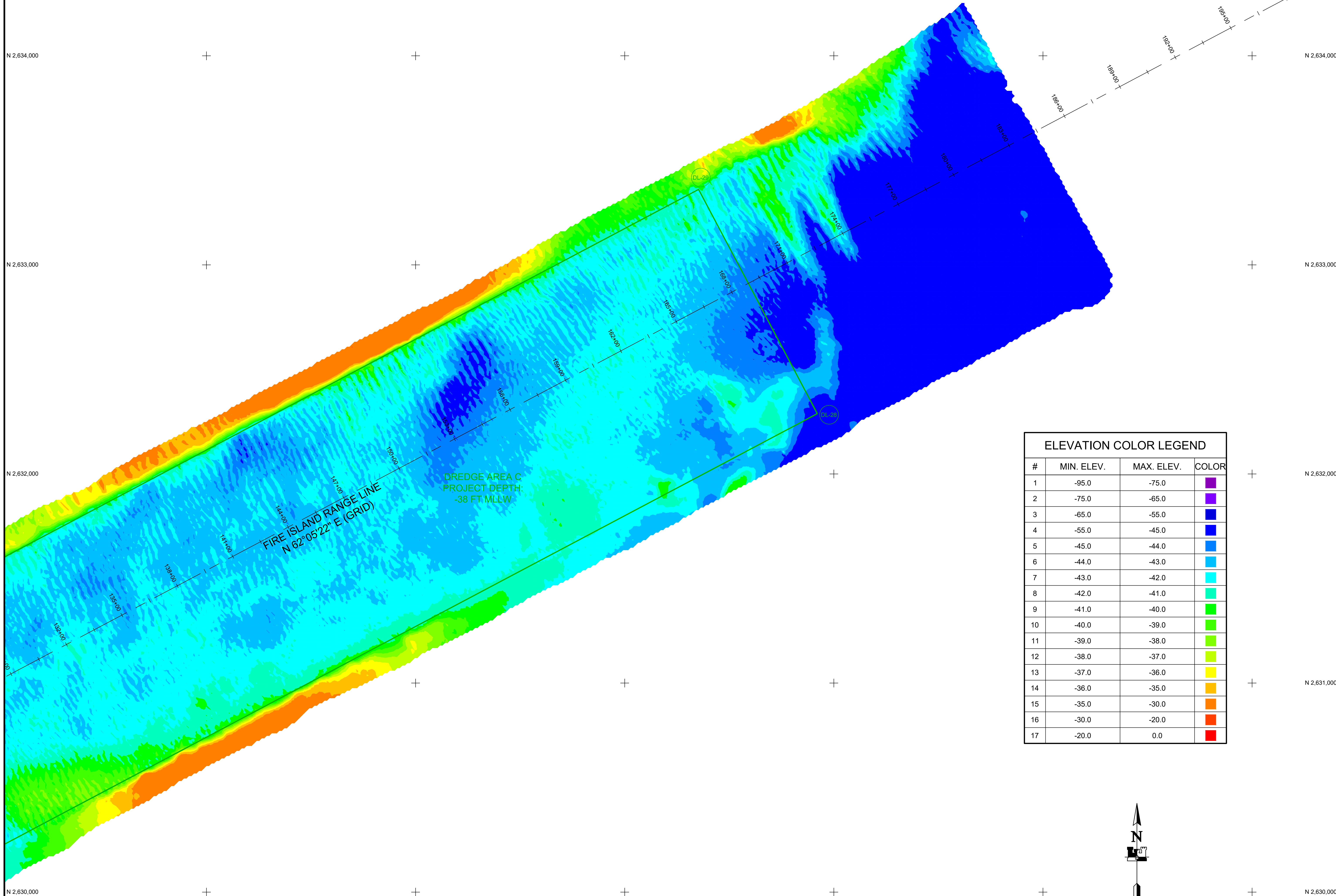



















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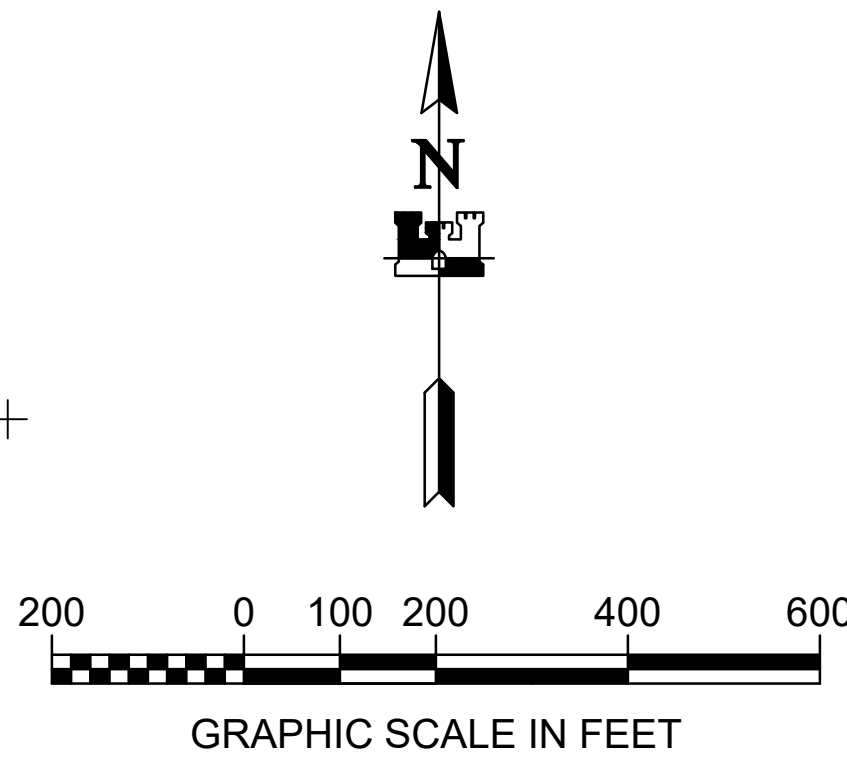
Gregory W. Gibson (317)



VOLUME COMPUTATIONS		
DREDGE AREA C	MLLW=0	CU. YD.
VOLUME AVAILABLE ABOVE	-38.0	345
VOLUME AVAILABLE ABOVE	-40.0	2,111
VOLUME AVAILABLE ABOVE	-43.0	54,846
DISPOSAL AREA		
VOLUME AVAILABLE BELOW	-45.0	1,505,605
TOTAL MAXIMUM VOLUME AVAILABLE IN AREA C (ABOVE -43.0)		54,846



ELEVATION COLOR LEGEND			
#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-95.0	-75.0	
2	-75.0	-65.0	
3	-65.0	-55.0	
4	-55.0	-45.0	
5	-45.0	-44.0	
6	-44.0	-43.0	
7	-43.0	-42.0	
8	-42.0	-41.0	
9	-41.0	-40.0	
10	-40.0	-39.0	
11	-39.0	-38.0	
12	-38.0	-37.0	
13	-37.0	-36.0	
14	-36.0	-35.0	
15	-35.0	-30.0	
16	-30.0	-20.0	
17	-20.0	0.0	



- NOTES**
1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 NAD2011 EPOCH 2010.0, US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PULASKI STATION TO THE NAD83/2011 EPOCH. THE PULASKI STATION IS USED TO DERIVE THE STATION NAMES "ANC2" (PT DL6488), "TBO" (PT DK4005), "TSEA" (PT AB0952), AND "ZANN" (PT DE9153).
2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83, IN US SURVEY FEET HOLDING USERRA TERRA "11" AS N 2,644,969.84 E, 1,660,159.24.
3. VERTICAL CONTROL IS A TIDE-PLANE MLLW DATUM DERIVED IN 2013 AND BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST# 94559520, ANCHORAGE, KNICK ARM, COOK INLET, ALASKA\* PUBLISHED 01/2011, 94559512, FIRE, HADEN, ALASKA\* PUBLISHED 01/2011, AND TIDE GAUGE 9454460, COOK\* PUBLISHED 01/2011, 94559519, PUBLISHED 09/202003. THIS TIDE-PLANE IS BASED ON THE 1983-2001 TIDAL EPOCH AT THOSE STATIONS AND IS REFERENCED BY HOLDING GPS CONTROL STATION TERRA "11" (PT BDC704) AS 90.40 FT.
4. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 12B) ELEVATIONS HOLDING "TIDAL" 16P (PT T70173/VMM335) AS 25.79 FT.
5. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
6. BATHYMETRY WAS COLLECTED MAY 01, 2019, BY ETTRAC INC. SOUNDINGS WERE COLLECTED USING AN R230NC 2024 MULTIBeam ECHOSOUNDER OPERATING AT 200 KHZ WITH A 120-DEGREE SWATH-WIDTH AND 100-DEGREE BEAM-SECTOR. DEPTH MEASUREMENTS WERE OBTAINED USING A PORTABLE SONAR AML BASE X SVP. SOUNDING VOLUME WAS ALSO MEASURED AT THE SOUNDER HEAD USING A VALEPORT MINSPIR. POSITIONING, VESSEL ATTITUDE, AND RTK TIDES WERE PROVIDED IN REAL TIME USING AN RTK GPS SYSTEM. A 100 HERTZ PORTABLE PSEUDO RANGE RECEIVER RTK CORRECTS FOR A TRIMBLE SP8585 RECEIVER SET AT CONTROL STATION "TERRA 11" LOCATED AT THE PORT OFFICE BUILDING. POST-PROCESS KINEMATIC CORRECTION USING POSPAC MINSPIR 8.2 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL POSITION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING GPS INTEGRATED SOFTWARE.
7. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
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SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
5920 THERMO 1 1988	2,642,764.70	1,660,183.87	37.3	AL MON (DISTURBED)
BM 12 1974	2,620,563.82	1,604,566.35	27.63	BRASS CAP
BM 5934 F	2,655,203.73	1,655,049.51	36.48	BRASS CAP
CRAIG	2,642,635.95	1,661,029.47	44.73	BRASS CAP
ETRAC-1	2,646,395.57	1,660,814.72	38.22	BRASS CAP
ETRAC-2	2,644,443.04	1,660,120.66	36.31	BRASS CAP
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NORTH END	2,646,649.84	1,660,584.80	41.51	USACE SBC
PORT 1989	2,639,934.29	1,656,925.43	39.64	AL MON
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RIFE 1960	2,620,502.19	1,604,162.70	29.99	BRASS CAP
SOUTH END	2,644,296.27	1,659,728.03	40.57	USACE SBC
TERRA 11 ARP	2,644,969.84	1,660,159.24	80.48	GPS ANTENNA REFERENCE POINT
TERRA 12 ARP	2,644,990.65	1,660,166.56	81.21	GPS ANTENNA REFERENCE POINT

DREDGE LIMITS		
CORNER#	NORTHING	EASTING
DL-28	2,632,288.21	1,628,921.02
DL-29	2,633,360.88	1,628,352.82
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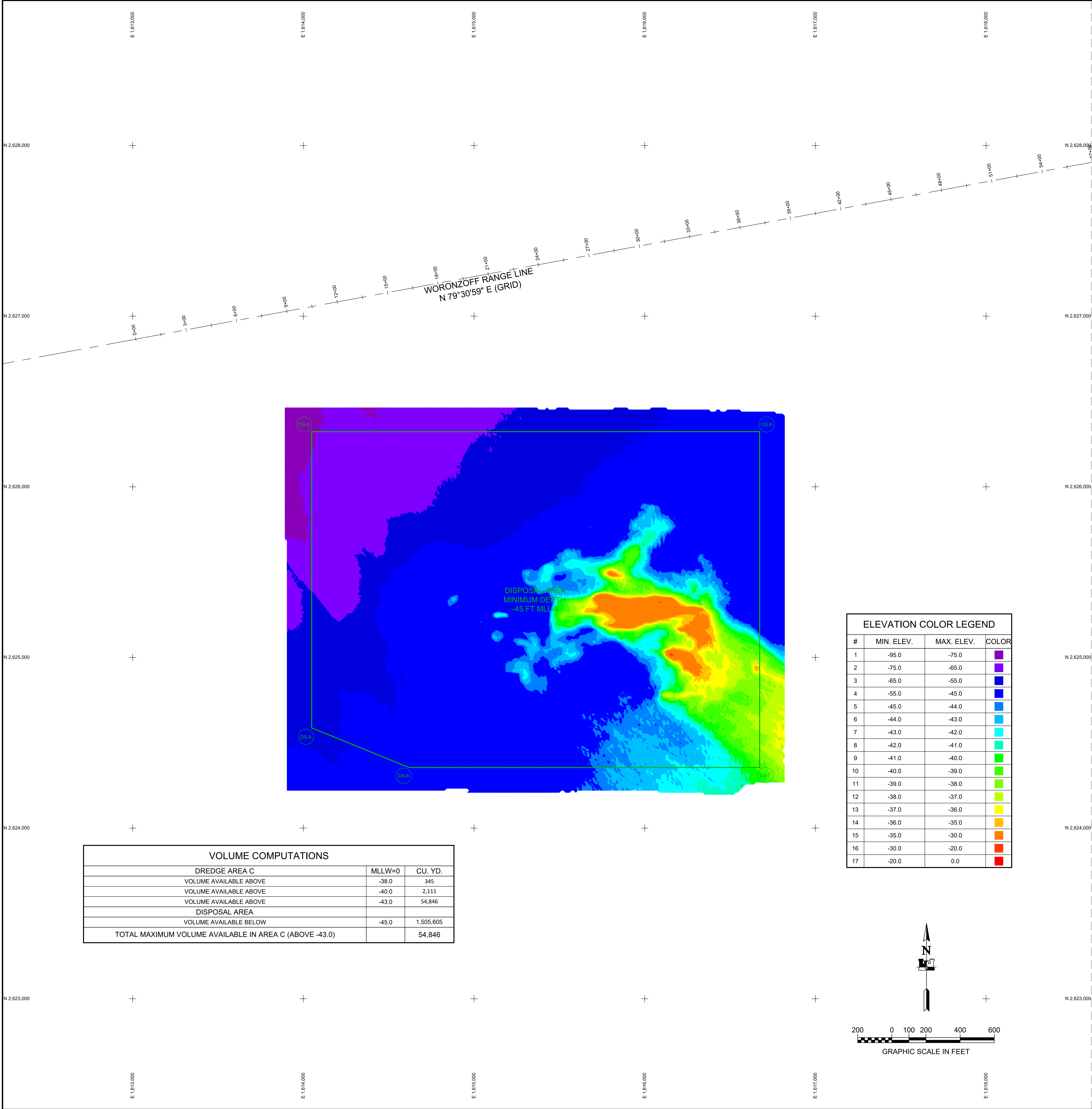
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Gregory W. Gibson (317)

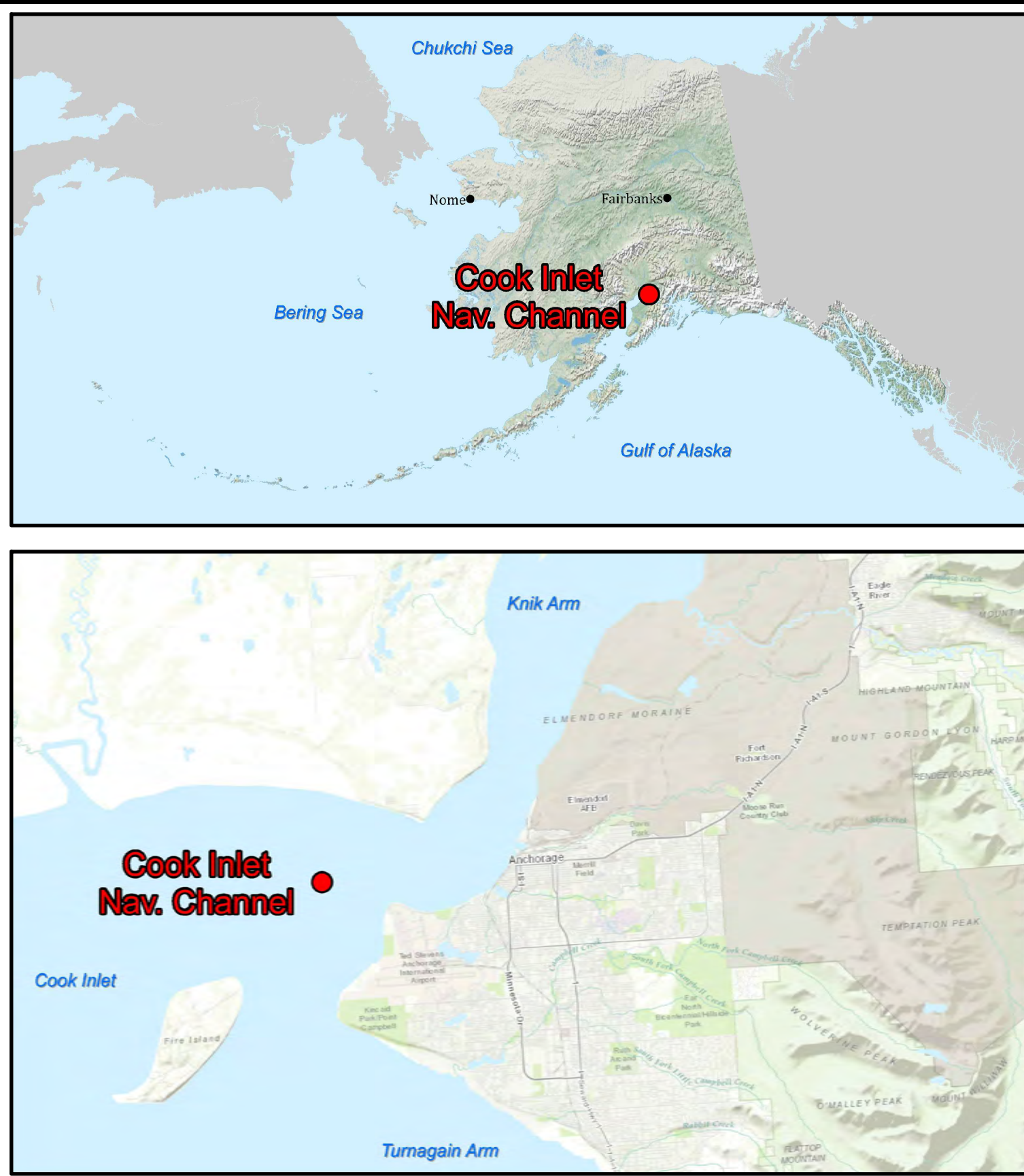
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- NOTES
1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83, NAD11 EPOCH 2010.00. IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NGS STATIONS "VAN DUSEN" (PID T14678) AND "LOOP 2 RM 3" (PID UV446) AND INCLUDED NGS CORS STATIONS "ANC2" (PID DL6498), "TBN" (PID DK4055), "TSEA" (PID A0892), AND "ZAN1" (PID DE9153).
  2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83, IN US SURVEY FEET HOLDING USACE "TERRA 11" AS N 2,644,969.84, E 1,660,159.24.
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  4. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 12B) ELEVATIONS HOLDING "TIDAL 16" (PID TT0713VMH1335) AS 29.73 FT.
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THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN NSPS/THSOA CERTIFIED HYDROGRAPHER  
Gregory W. Gibson (317)

US Army Corps of Engineers  
ALASKA DISTRICT

CONTRACT NO. W11013-16-0000  
CONTRACTOR: MANSON CONSTRUCTION CO.  
CITY: SEATTLE  
Recommended: \_\_\_\_\_  
Approved: \_\_\_\_\_  
Date: \_\_\_\_\_  
BY: \_\_\_\_\_  
DATE: \_\_\_\_\_  
DESCRIPTION: \_\_\_\_\_  
REVISION: \_\_\_\_\_

DATE: 19 May 2019  
DESIGNED BY: JANCENP3  
CHECKED BY: JANCENP3  
APPROVED BY: JANCENP3  
SCALE: 1" = 200'  
FILE NAME: PRE\_20190501\_CINC\_FINAL.DWG  
JOB: JBER, ALASKA 0506-0808

ANCHORAGE, ALASKA  
2018-2020 MAINTENANCE DREDGING, COOK INLET  
HYDROGRAPHIC SURVEY  
PRE\_20190501\_CINC

SHEET IDENTIFICATION  
V-101  
Sheet 6 of 6