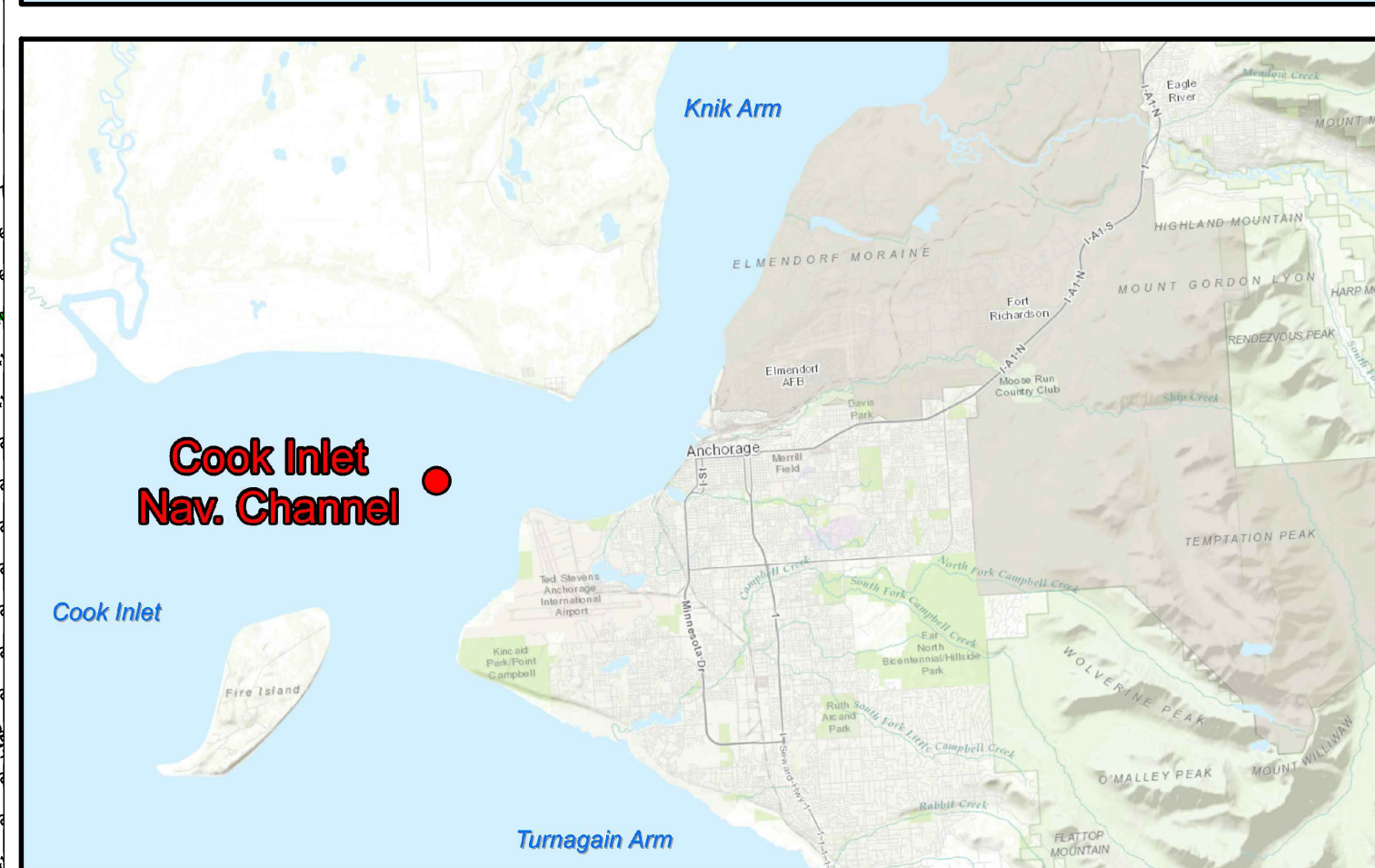
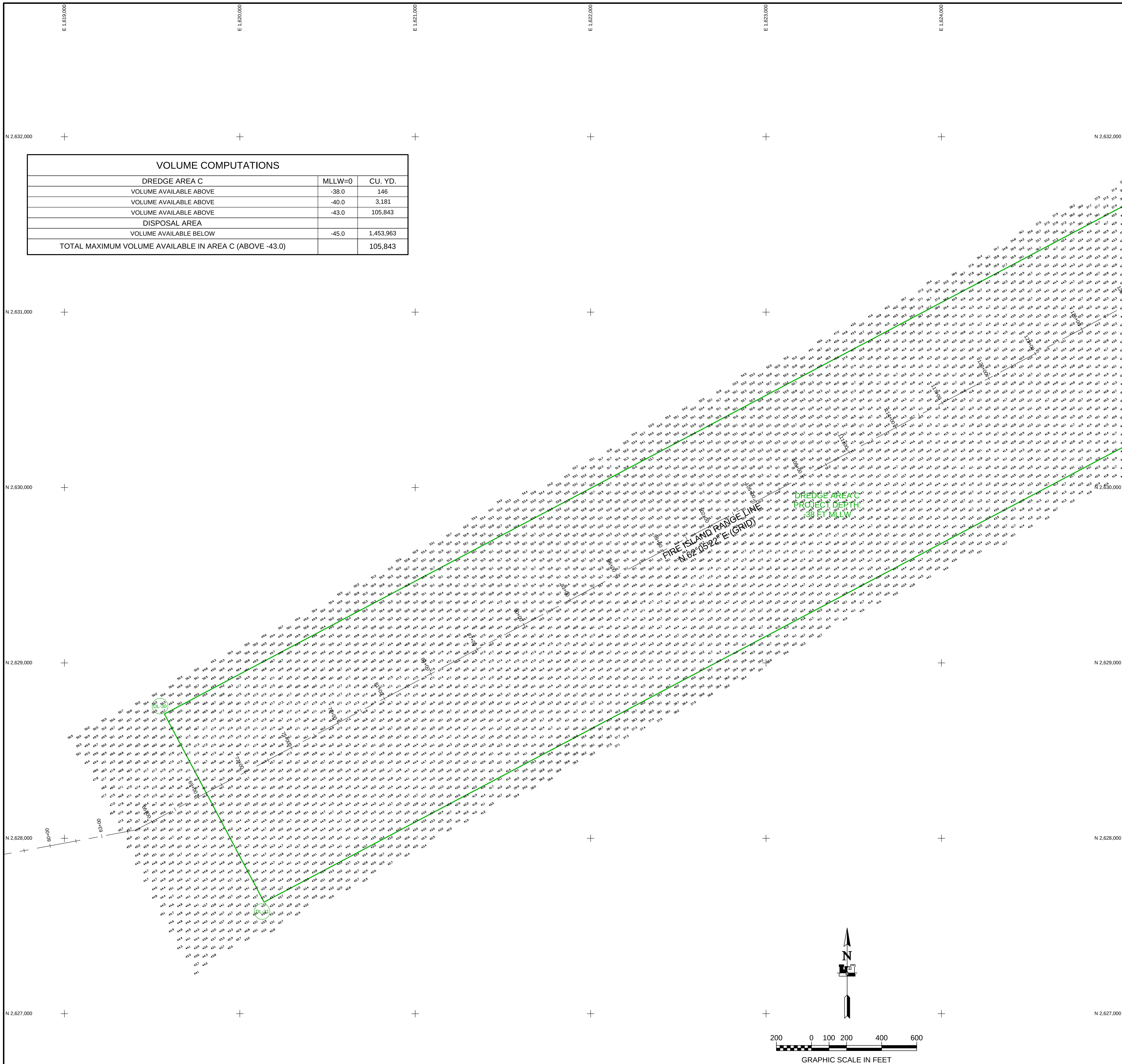


VOLUME COMPUTATIONS		
DREDGE AREA C	MLLW=0	CU. YD.
VOLUME AVAILABLE ABOVE	-38.0	146
VOLUME AVAILABLE ABOVE	-40.0	3,181
VOLUME AVAILABLE ABOVE	-43.0	105,843
DISPOSAL AREA		
VOLUME AVAILABLE BELOW	-45.0	1,453,963
TOTAL MAXIMUM VOLUME AVAILABLE IN AREA C (ABOVE -43.0)		105,843



- NOTES**
1. PRIMARY PROJECT HORIZONTAL CONTROL IS ATLASKA STATE PLANE, ZONE 4, NAD83 AND NA2011 EPOCH 2011 SURVEY POINTS ARE USED TO DERIVE THE TILTED PLANE MLLW. THE TILTED PLANE MLLW IS BASED ON THE PUBLISHED NGC STATIONS "VAN DUSEN" (PT TT47676) AND "LOOP 2 RM 3" (PT U44984) AND INCLUDED NGCS CORRS STATIONS "ANZC" (PT DL6488), "TBON" (PT DK0405), "TSEA" (PT AU0652), AND "ZABN" (PT DE9153).
 2. LOCAL PROJECT HORIZONTAL CONTROL IS ATLASKA STATE PLANE, ZONE 4, NAD83, IN US SURVEY FEET HOLDING USACE "TERRA 11" IN S 2,644,969.84, E 1,680,159, 25.4.
 3. VERTICAL CONTROL, IS A TILTED-PLANE MLLW DATUM DERIVED IN 2013 AND BASED ON THE NOAA/NOS TIDAL BENCH MARK READINGS "9455920, ANCHORAGE, KNICK ARIF, COOK INLET, ALASKA" PUBLISHED 10/24/2011, "9455912, FIRE ISLAND, ANCHORAGE" PUBLISHED 05/21/2004, AND "9455934, PORT MACKENZIE, COOK INLET, ALASKA" PUBLISHED 05/21/2004. THE TILTED-PLANE MLLW IS BASED ON THE 1981-2001 TIDAL EPOCH AT THOSE STATIONS AND IS REFERENCED BY HOLDING GPS CONTROL STATION "TERRA 11" (PT BDC104) AS 80.48 FT.
 4. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 12B) ELEVATIONS HOLDING "TIDAL 16" (PT TT07133/MM1335) AS 29.078 FT.
 5. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
 6. BATHYMETRY WAS COLLECTED MAY 02, 2018, BY ETTRAC 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 SVP-3010 C-MANAC SOUND VELOCITY MEASUREMENT SYSTEM. POSITIONS WERE DETERMINED USING A GARMIN MINIPVS, POSITIONING, VESSEL ATTITUDE, AND RTID KITES WERE PROVIDED IN REAL TIME USING AN APLRANIX POSMV IMV W/ VEWAMESTER POSITIONING SYSTEM RECEIVING RTID CORRECTS FROM A TRIMBLE SP5850 RECEIVER SET AT CONTROL STATION "TERRA 11" LOCATED AT THE PORT OFFICE BUILDING. POST-PROCESS KINEMATIC CORRECTIONS WERE OBTAINED FROM POSPAC WMS 7.1 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL NAVIGATION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING GPS INTEGRATED SOFTWARE.
 7. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
 8. MAP SOUNDINGS ARE BINNED AT 48 FEET (SHOAL-BIASED), COLOR ELEVATIONS ARE BINNED AT 12 FEET (SHOAL-BIASED). VOLUME SOUNDINGS ARE BINNED AT 3 FEET (NEAR VALUE).

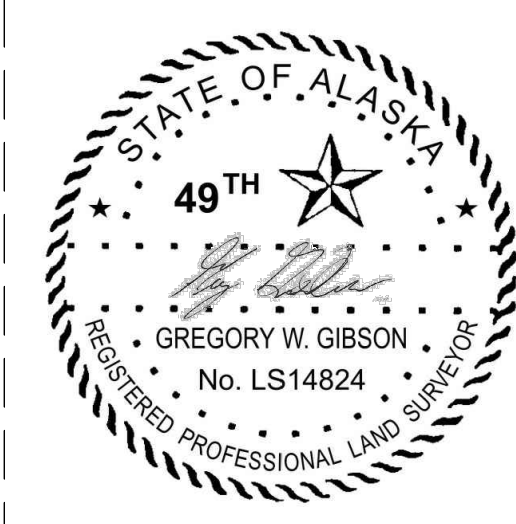
SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
5920 THERMO 1 1988	2,642,784.70	1,660,183.87	37.3	AL MON (DISTURBED)
BM 12 1974	2,620,563.82	1,604,566.35	27.63	BRASS CAP
BM 5934 F	2,655,203.73	1,655,049.51	36.48	BRASS CAP
CRAIG	2,642,635.95	1,661,029.47	44.73	BRASS CAP
ETRAC-1	2,646,395.57	1,660,814.72	38.22	BRASS CAP
ETRAC-2	2,644,443.04	1,660,120.66	36.31	BRASS CAP
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

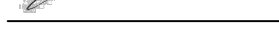
DREDGE LIMITS		
CORNER#	NORTHING	EASTING
DS-6	2,626,323.49	1,616,673.28
DS-7	2,624,354.99	1,616,673.28
DS-8	2,624,354.99	1,614,619.08
DS-9	2,624,587.68	1,614,048.61

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

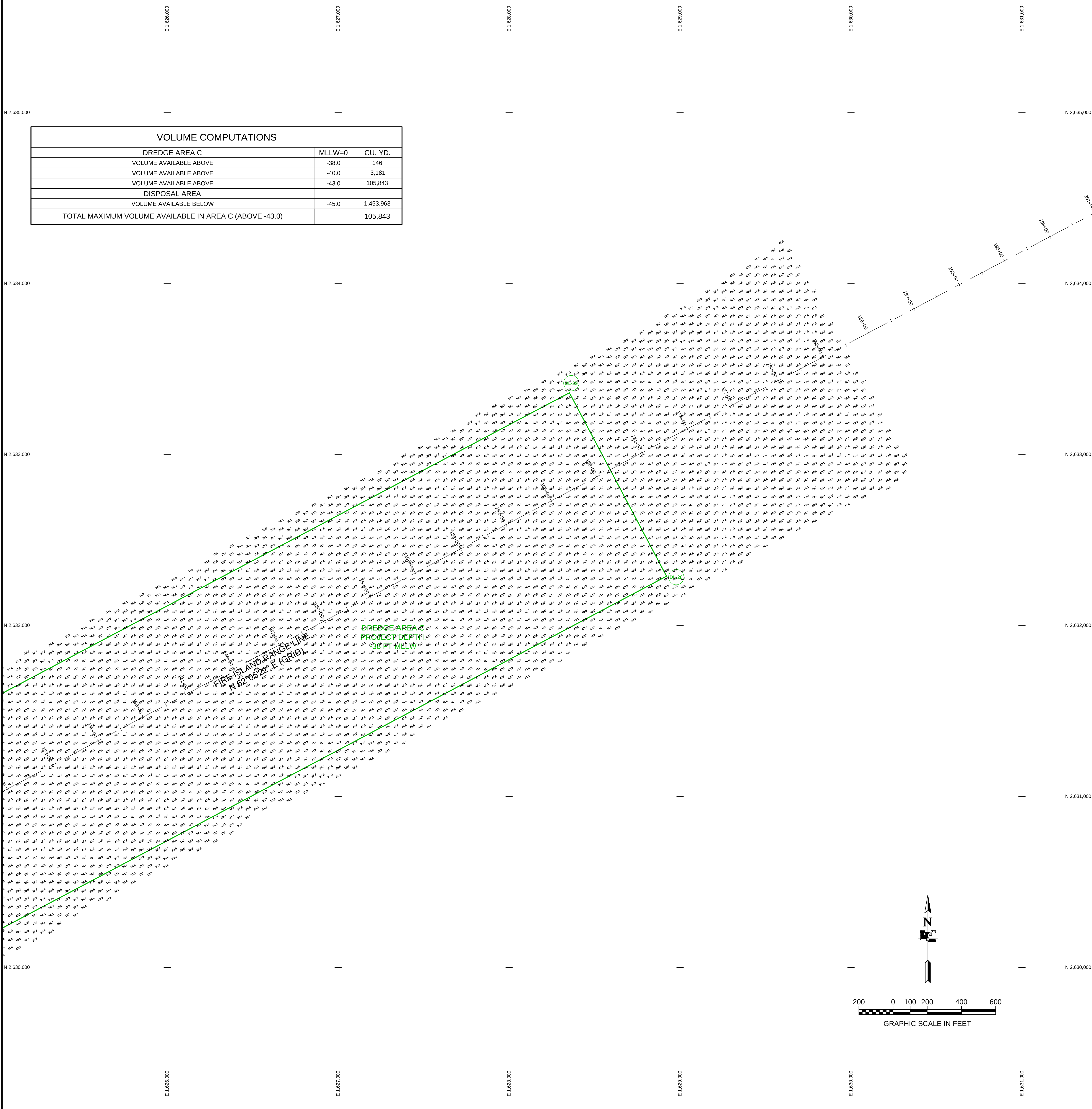
SURVEY LIMITS		
CORNER#	NORTHING	EASTING
SL-24	2,626,423.49	1,613,948.61
SL-25	2,624,254.99	1,613,948.61
SL-26	2,624,254.99	1,616,773.28
SL-27	2,626,423.49	1,616,773.28



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



Gregory W. Gibson (317)



VOLUME COMPUTATIONS		
DREDGE AREA C	MLLW=0	CU. YD.
VOLUME AVAILABLE ABOVE	-38.0	146
VOLUME AVAILABLE ABOVE	-40.0	3,181
VOLUME AVAILABLE ABOVE	-43.0	105,843
DISPOSAL AREA		
VOLUME AVAILABLE BELOW	-45.0	1,453,963
TOTAL MAXIMUM VOLUME AVAILABLE IN AREA C (ABOVE -43.0)		105,843



- NOTES
- PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 NA2011 EPOCH 2010.00, IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NGS STATIONS "VAN DUSEN" (PID TT4676) AND "LOOP 2 RM 3" (PID UV446) AND INCLUDED NGS CORS STATIONS "ANC2" (PID DL6498), "TBON" (PID DK4055), "TSEA" (PID AI0952), AND "ZAN1" (PID DE9153). 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.
 - 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 10/24/2011, "9455912, FIRE ISLAND, ALASKA" PUBLISHED 05/21/2004, AND "9455934, PORT MACKENZIE, COOK INLET, ALASKA" PUBLISHED 05/23/2003. THIS TILTED-PLANE MLLW IS BASED ON THE 1983-2001 TIDAL EPOCH AT THOSE STATIONS AND IS REFERENCED BY HOLDING GPS CONTROL STATION "TERRA 11" (PID B6C04) AS 80.48 FT.
 - VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 128) ELEVATIONS HOLDING "TIDAL 16" (PID TT0713/VMM135) AS 29.79 FT.
 - SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
 - BATHYMETRY WAS COLLECTED MAY 02, 2018, BY ETRAC 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 AML BASE X SVP. SOUND VELOCITY WAS ALSO MEASURED AT THE SOUNDER HEAD USING A VALEPORT MINISVP. POSITIONING, VESSEL ATTITUDE, AND RTK TIDES WERE PROVIDED IN REAL TIME USING AN APPLANK POSHIV MV V6 WAVEMASTER POSITIONING SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 RECEIVER SET AT CONTROL STATION "TERRA 11" LOCATED ATOP THE PORT OFFICE BUILDING. POST-PROCESS KINEMATIC CORRECTION USIN POSPAC MMS 7.1 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL NAVIGATION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING GPS INTEGRATED SOFTWARE.
 - THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
 - MAP SOUNDINGS ARE BINNED AT 48 FEET (SHOAL-BIASED). COLOR ELEVATIONS ARE BINNED AT 12 FEET (SHOAL-BIASED). VOLUME SOUNDINGS ARE BINNED AT 3 FEET (MEAN VALUE).

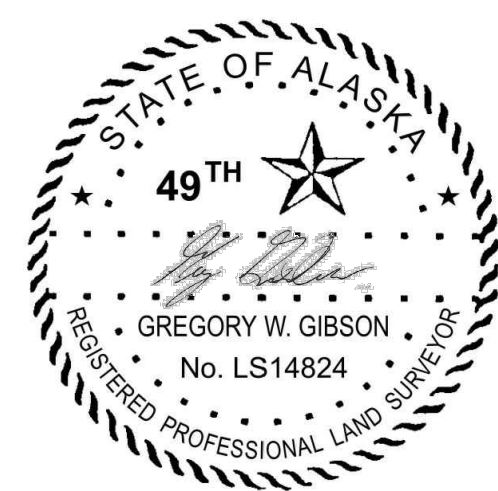
SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
5920 THERMO 1 1988	2,642,784.70	1,660,183.87	37.3	AL MON (DISTURBED)
BM 12 1974	2,620,563.82	1,604,566.35	27.63	BRASS CAP
BM 5934 F	2,655,203.73	1,655,049.51	36.48	BRASS CAP
CRAIG	2,642,635.95	1,661,029.47	44.73	BRASS CAP
ETRAC-1	2,646,395.57	1,660,814.72	38.22	BRASS CAP
ETRAC-2	2,644,443.04	1,660,120.66	36.31	BRASS CAP
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

Gregory W. Gibson (317)

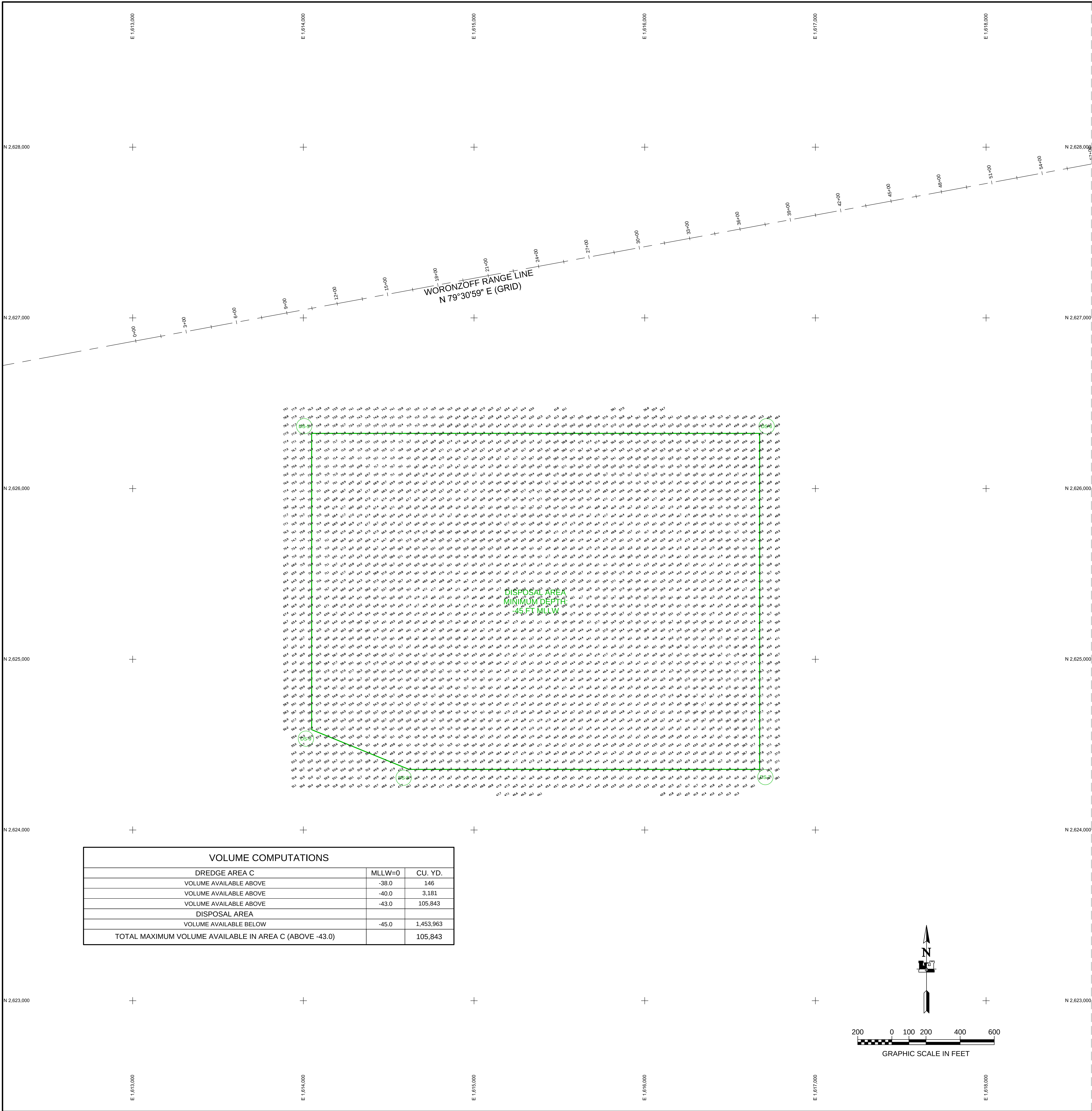
US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W18J61H-C-004
CONTRACTOR WANSLEY CONSTRUCTION CO.
CITY SEATTLE
STATE WASHINGTON
Approved: _____
Date: 9/17/20
SHEET 2 OF 6

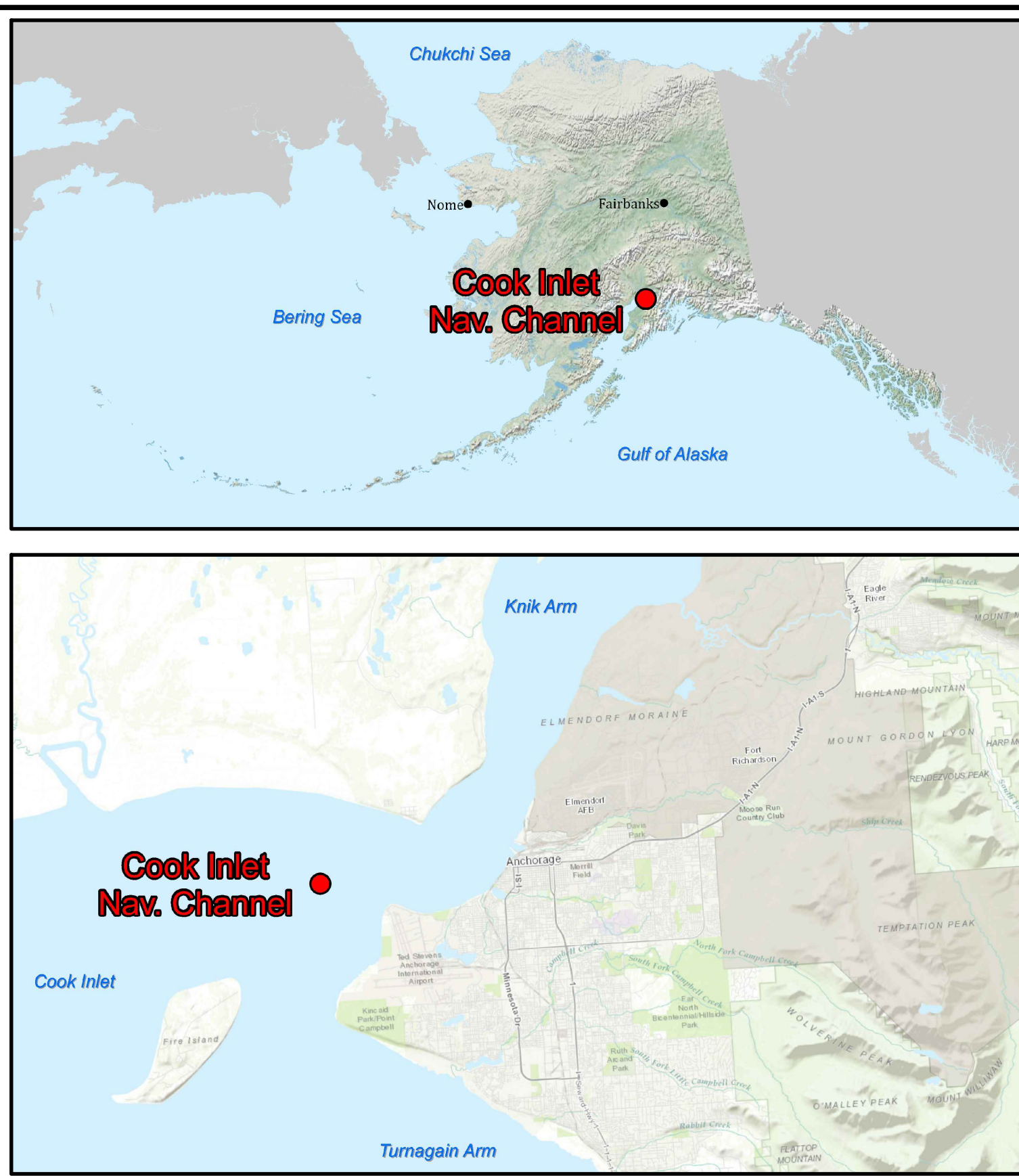
NO.	DESCRIPTION	DATE
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3	REVISION	
4	REVISION	
5	REVISION	
6	REVISION	
7	REVISION	
8	REVISION	
9	REVISION	
10	REVISION	

ANCHORAGE, ALASKA
2018-2020 MAINTENANCE DREDGING, COOK INLET
HYDROGRAPHIC SURVEY
PRE 20180502_CINC

SHEET IDENTIFICATION
V-101
Sheet 2 of 6



VOLUME COMPUTATIONS		
DREDGE AREA C	MLLW=0	CU. YD.
VOLUME AVAILABLE ABOVE	-38.0	146
VOLUME AVAILABLE ABOVE	-40.0	3,181
VOLUME AVAILABLE ABOVE	-43.0	105,843
DISPOSAL AREA		
VOLUME AVAILABLE BELOW	-45.0	1,453,963
TOTAL MAXIMUM VOLUME AVAILABLE IN AREA C (ABOVE -43.0)		105,843



- 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 AI0692), AND "ZAN1" (PID DE9153). 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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 3. 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.
 4. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
 5. BATHYMETRY WAS COLLECTED MAY 02, 2018, BY ETRAC INC. SOUNDINGS WERE COLLECTED USING AN R2SONIC 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 AML BASE X SVP. SOUND VELOCITY WAS ALSO MEASURED AT THE SOUNDER HEAD USING A VALEPORT MINIVS. POSITIONING, VESSEL ATTITUDE, AND RTK TIDES WERE PROVIDED IN REAL TIME USING AN APPLINK POSMV M/V US WAVEMASTER POSITIONING SYSTEM RECEIVING RTK CORRECTS FROM A TRIMBLE SP5855 RECEIVER SET AT CONTROL STATION "TERRA 11" LOCATED ATOP THE PORT OFFICE BUILDING. POST-PROCESS KINEMATIC CORRECTION USING POSPAC MMS 7.1 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL NAVIGATION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING GPS INTEGRATED SOFTWARE.
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SURVEY CONTROL DATA				
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TERRA 12 ARP	2,644,990.65	1,660,166.56	81.21	GPS ANTENNA REFERENCE POINT

DREDGE LIMITS		
CORNER#	NORTHING	EASTING
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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. WJ45131-0000
CONTRACTOR: MANSOOR CONSTRUCTION CO.
CITY: SEATTLE
APPROVED: [Signature]
DATE: [Date]

DATE: 7 May 2018
DESIGNED BY: [Signature]
CHECKED BY: [Signature]
APPROVED BY: [Signature]
SCALE: 1" = 200'
FILE NAME: P:\2018\2018-2020 MAINTENANCE DREDGING, COOK INLET HYDROGRAPHIC SURVEY\PRE_20180502_CINC.FIN.DWG

ANCHORAGE, ALASKA
2018-2020 MAINTENANCE DREDGING, COOK INLET
HYDROGRAPHIC SURVEY
PRE_20180502_CINC

SHEET IDENTIFICATION
V-101
Sheet 3 of 6