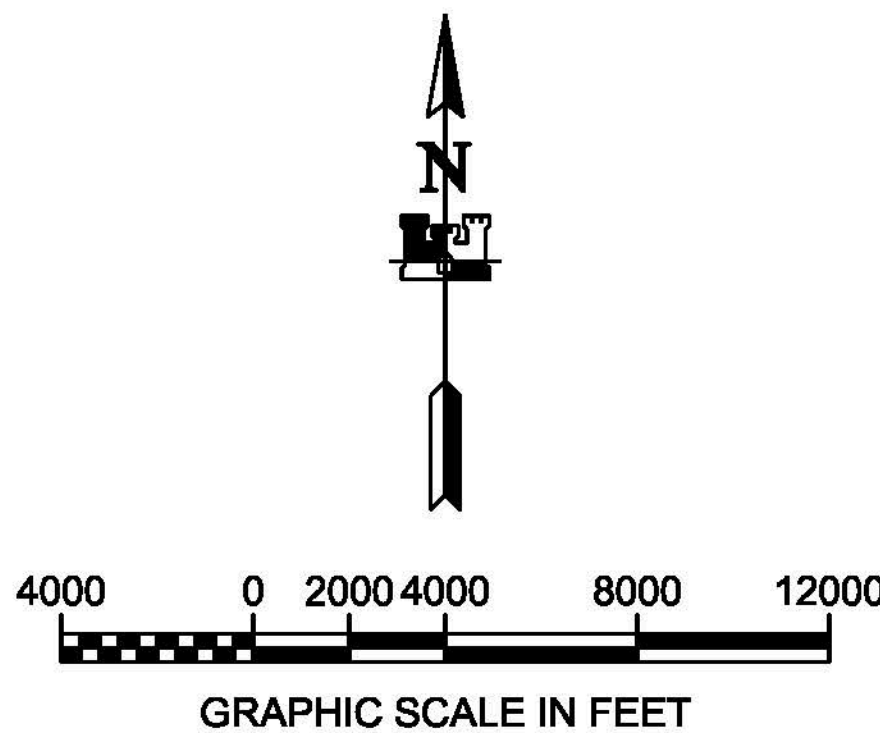




1. PRIMARY HORIZONTAL CONTROL FOR THE PROJECT IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS98) EPOCH 2003.0, IN US SURVEY FEET HOLDING "N 1°16'29" AS 11,726.2152, E 2,626,988.30", "1317 C 2000" AS 11,768,678.70, E 2,834,781.79. "NAD83 STATE PLANE ALASKA STATE PLANE ZONE 1, NAD83(CORS98) EPOCH 2003.0, HOLDING NOANOS TIDAL BENCH MARK VALUES FOR "JUNEAU" WAS 1" (NGS PID #4387), "BIKARA ISLAND 1" (NGS PID A0522) AND "LOVERLAND ISLAND 1" (NGS PID A4340).

2. LOCAL PROJECT HORIZONTAL CONTROL, IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS98) EPOCH 2003.0, IN US SURVEY FEET HOLDING "N 1°16'29" AS 11,726.2152, E 2,626,988.30", "1317 C 2000" AS 11,768,678.70, E 2,834,781.79. "NAD83 STATE PLANE ALASKA STATE PLANE ZONE 1, NAD83(CORS98) EPOCH 2003.0, HOLDING NOANOS TIDAL BENCH MARK VALUES FOR "JUNEAU" WAS 1" (NGS PID #4387), "BIKARA ISLAND 1" (NGS PID A0522) AND "LOVERLAND ISLAND 1" (NGS PID A4340).

3. FOR A LARGE VERTICAL CONTROL, IS REFERENCED TO MEAN LOWER LOW WATER (MLLW) 0 F.T.

4. A TIDAL AND DISPOSAL AREA: MLLW IS BASED ON THE NOANOS TIDAL BENCHMARK SLT "945 1344 TURN POINT, ALASKA" (NGS PID B0100) WHICH IS BASED ON THE 1985-2001 TIDAL EPOCH, HOLDING NOANOS TIDAL BENCH MARK "945 1434 TIDAL BENCH MARK" (WM1180194PDBB08C2) AS 27.14 FT.

5. A TIDAL BENCH MARK IS BASED ON THE NOANOS TIDAL BENCHMARK SLT "945 1346 PAKPERS LANDING, WRANGELL NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 BASED ON THE 1983-2001 TIDAL EPOCH, HOLDING NOANOS TIDAL BENCHMARK "945 1346 C" (WM117250PDBB08B7Z1) AS 15.17 FT.

6. A TIDAL BENCH MARK IS BASED ON THE NOANOS TIDAL BENCHMARK SLT "945 1346 PAKPERS LANDING, WRANGELL NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 BASED ON THE 1983-2001 TIDAL EPOCH, HOLDING NOANOS TIDAL BENCHMARK "945 1346 C" (WM117250PDBB08B7Z1) AS 15.17 FT., "945 1317 ANCHOR POINT, WRANGELL NARROWS, ALASKA" (WM117249PDBB08B7Z1) AS 16.60 FT., "945 1287 A BECHER PASS, WRANGELL NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 HOLDING NOANOS TIDAL BENCHMARK "945 1287 A" (WM117243PDBB08B7Z1) AS 16.40 FT.

7. A TIDAL BENCH MARK IS BASED ON THE NOANOS TIDAL BENCHMARK SLT "945 1285 POINT LOCKWOOD, WRANGELL NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 BASED ON THE 1983-2001 TIDAL EPOCH, HOLDING NOANOS TIDAL BENCHMARK "945 1285 TIDAL BENCH MARK" (WM117236PDBB08B7Z1) AS 17.42 FT.

8. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 128) ELEVATIONS HOLDING NOANOS TIDAL BENCHMARKS: "945 1434 TIDAL BENCH MARK" (WM1180194PDBB08C2) AS 23.87 FT., "945 1346 PAKPERS LANDING, WRANGELL NARROWS, ALASKA" (WM117250PDBB08B7Z1) AS 15.17 FT., "945 1317 ANCHOR POINT, WRANGELL NARROWS, ALASKA" (WM117249PDBB08B7Z1) AS 16.60 FT., "945 1287 A BECHER PASS, WRANGELL NARROWS, ALASKA" (WM117243PDBB08B7Z1) AS 16.40 FT., "945 1285 POINT LOCKWOOD, WRANGELL NARROWS, ALASKA" (WM117236PDBB08B7Z1) AS 17.42 FT.

9. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

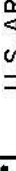
10. BATHYMETRY WAS COLLECTED MAY 4 - MAY 10, 2018. SOUNDINGS WERE COLLECTED USING AN RS200C 2022 MULTIBeam ECHOSOUNDER OPERATING AT 200KHZ, SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITIONING AND VESSEL ORIENTATION WERE DETERMINED USING AN APPLIED AUTOMATED OCCASIONAL SURVEYING (APOS) SYSTEM CORRECTED FOR A "TRIMBLE SP5865 GPS RECEIVER SET AT CONTROL STATION "N414 200", "1346 C 2003" AND, "N 1°16'29" SURVEY DATA WAS COLLECTED USING QINSY R1 AND PROCESSED USING QIMERA 1.5.1 SOFTWARE. HORIZONTAL CONTROL WAS DETERMINED USING THE STATE CENSUS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING.

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

12. MAP SOUNDINGS ARE BINNET AT 46 FEET AND ARE SHOAL BAIRES, CONTOURS ARE BASED ON 12 FEET BINNET SHOAL-BASED SOUNDINGS.

 US Army Corps of Engineers ALASKA DISTRICT	
CONTRACT NO. <u>W011KB-I42-0010131EF0045</u> CONTRACTOR <u>ETRAC INC.</u> CITY <u>WASILLA</u> STATE <u>ALASKA</u>	Date <u>06/20/2018</u> Approved <u>THOMAS A. SLOAN</u> Recommended <u>MICHAEL E. MUELLER</u> <u>MIKE E. MUELLER</u> CHIEF OF WORKS SECTION PHONE CONTRACTORS <u>907-663-1111</u>

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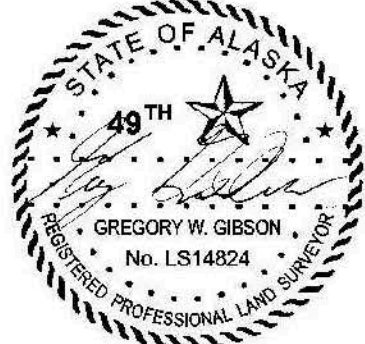
	U.S. ARMY CORPS OF ENGINEERS 617 S. Koyuk River Rd., Suite C Anchorage, Alaska 99504		617 S. Koyuk River Rd., Suite C Anchorage, Alaska 99504	
	IBER, ALASKA 89800-8888		Wailala AK, 99554	
Survey Vt. Gibson		DATE: 24 June 2018		
DOWN BY: SYSTEMS JASON LEWIS		APPROVED BY: JASON LEWIS		
FORMER A. Stone, Chief Domestic Sections		CONTRACT NO.: W01P6-14-0001-WF0045		
Plot Date: 02-24-2018		FILE NAME: 02-24-2018		
SIZE 11MB		SIZE 11MB		
11MB		11MB		

PETERSBURG, ALASKA
072852 - WRANGELL NARROWS
PROJECT CONDITION SURVEY
MAY 04 - MAY 10, 2018

SHEET
IDENTIFICATION

1-WRA-92-07-54

Sheet 1 of 27



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



Greg Gibson C.H. (317)

USCG NO.	NORTHING	EASTING	DESCRIPTION
23205	1,824,213	2,832,673	CHANNEL LIGHTED BUOY 62

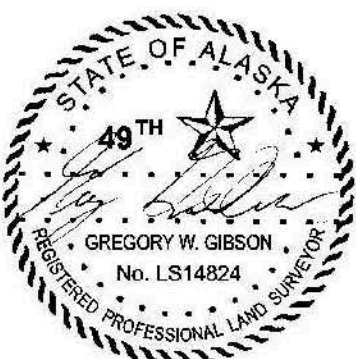
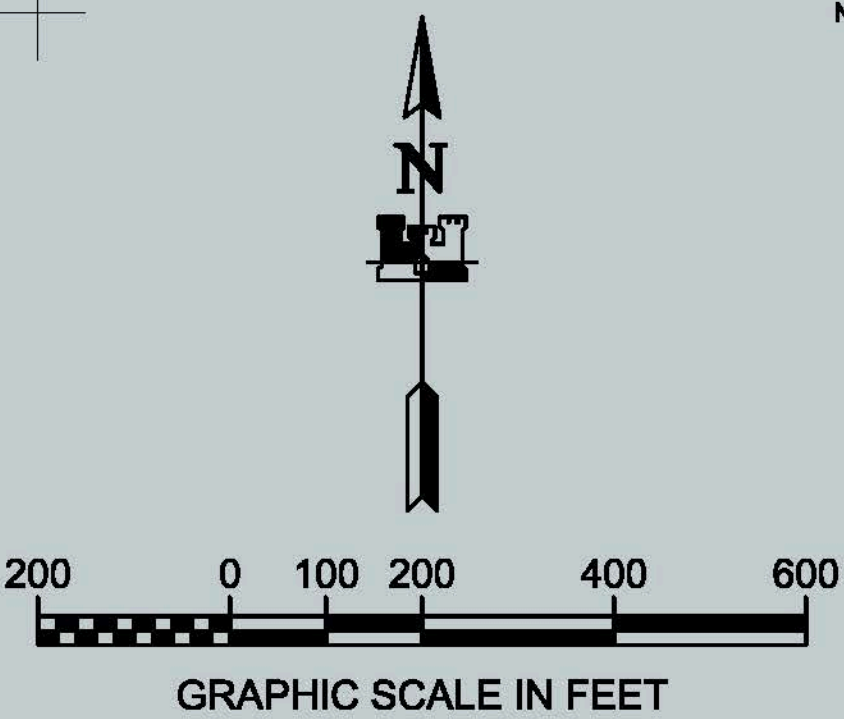


NOTES

1. PRIMARY HORIZONTAL CONTROL FOR THE PROJECT IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS96) EPOCH 2003, IN US SURVEY FEET, BASED ON A STATIC GPS NETWORK HOLDING THE NGS EPS 20030303 CORS APS VALUATION "PUBS" FOR "JNEUA" WASD 1" NGS ID "P7" (D74807, BIORA ALASKA 1" NGS ID P04522) AND 12 FEET BINNED (1" NGS ID P04303).
2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS96) EPOCH 2003, IN US SURVEY FEET HOLDING "N0 11929" AS N 1,726,216.212 D 2,628,968.358, "1337" AS N0 1,735,678.770 D 2,834,781.759, "1346 C 0007" AS N 1,761,610.07 D 3,253,265.167, AND "N4 2004" AS N 1,618,325.92 D 2,927.135.
3. FOR ALL AREAS VERTICAL CONTROL, IS REFERENCED TO MEAN LOWER LOW WATER (MLLW(0 FT)).
4. AREA 1 AND DISPOSAL AREA: MLLW IS BASED ON THE NOAA'S TIDAL BENCHMARK SLIP "945 1434 TURN POINT, 11/20/1998" (PUBS) FOR "JNEUA" WASD 1" NGS ID "P7" (D74807, BIORA ALASKA 1" NGS ID P04522) AND 12 FEET BINNED "945 1434 TIDAL A" (VMW18106(DRBBBCC6) AS 27.14 FT.
5. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (BENCH MARK 11) ELEVATIONS HOLDING NAVOUSTAGE TIDAL BENCHMARKS: "945 1434 TIDAL A" (VMW18106(DRBBBCC6) AS 23.83 FT, "VMW1243" (VMW18106(DRBBBCC6) AS 11.98 FT, "VMW1243" (VMW18106(DRBBBCC6) AS 13.78 FT, "AS 1287 A" (VMW1243) AS 13.76 FT, AND "945 1434 TIDAL A" (VMW12325(DRBBF11) AS 14.15 FT.
6. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
7. BATHYMETRY WAS COLLECTED MAY 4 - MAY 10, 2018. SOUNDINGS WERE COLLECTED USING AN ROSONIC 2002 MULTIBeam ECHOSOUND OPERATING AT 2000CZ, SOUND EQUIDISTANCE THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SURVEY PROCESS, POSITIONING AND VESSEL ORIENTATION WERE DETERMINED USING GPS TRACKING OBSERVATIONS AND A GPS TRACKING SYSTEM RECEIVING RTK CORRECTIVE DATA FROM A TRIMBLE SP585 GPS RECEIVER SET AT CONTROL STATION "N4 2004" 1337 AS 1337 "C2003", AND "N0 11925" SURVEY DATA WAS COLLECTED USING QINSY 8.1 AND PROCESSED USING QIMERA C 1.5.1, SOFTWARE: HORIZONTAL CONTROL WAS DETERMINED USING A STATIC GNSS EQUIPMENT AND TECHNIQUES: VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING.
8. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
9. MAP SOUNDINGS ARE BINNED AT 46 FEET AND ARE SHOAL BINNED. CONTOURS ARE BASED ON 12 FEET BINNED SHOAL-BASED SOUNDINGS.

SURVEY CONTROL DATA: DISPOSAL AREA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1434 A 2006	1,814,207.81	2,823,232.54	27.14	NOAA/NOS BENCHMARK SBC
NH-4 2000	1,818,325.29	2,827,135.91	25.21	BRASS DISK
WN-1A 1999	1,821,893.61	2,830,057.14	24.19	USACE DOME BC

PROJECT LIMITS DISPOSAL AREA		
NAME	NORTHING	EASTING
DL-1	1,824,817.19	2,834,422.30
DL-2	1,825,755.19	2,836,629.30
DL-3	1,824,523.19	2,837,153.30
DL-4	1,823,584.19	2,834,946.30

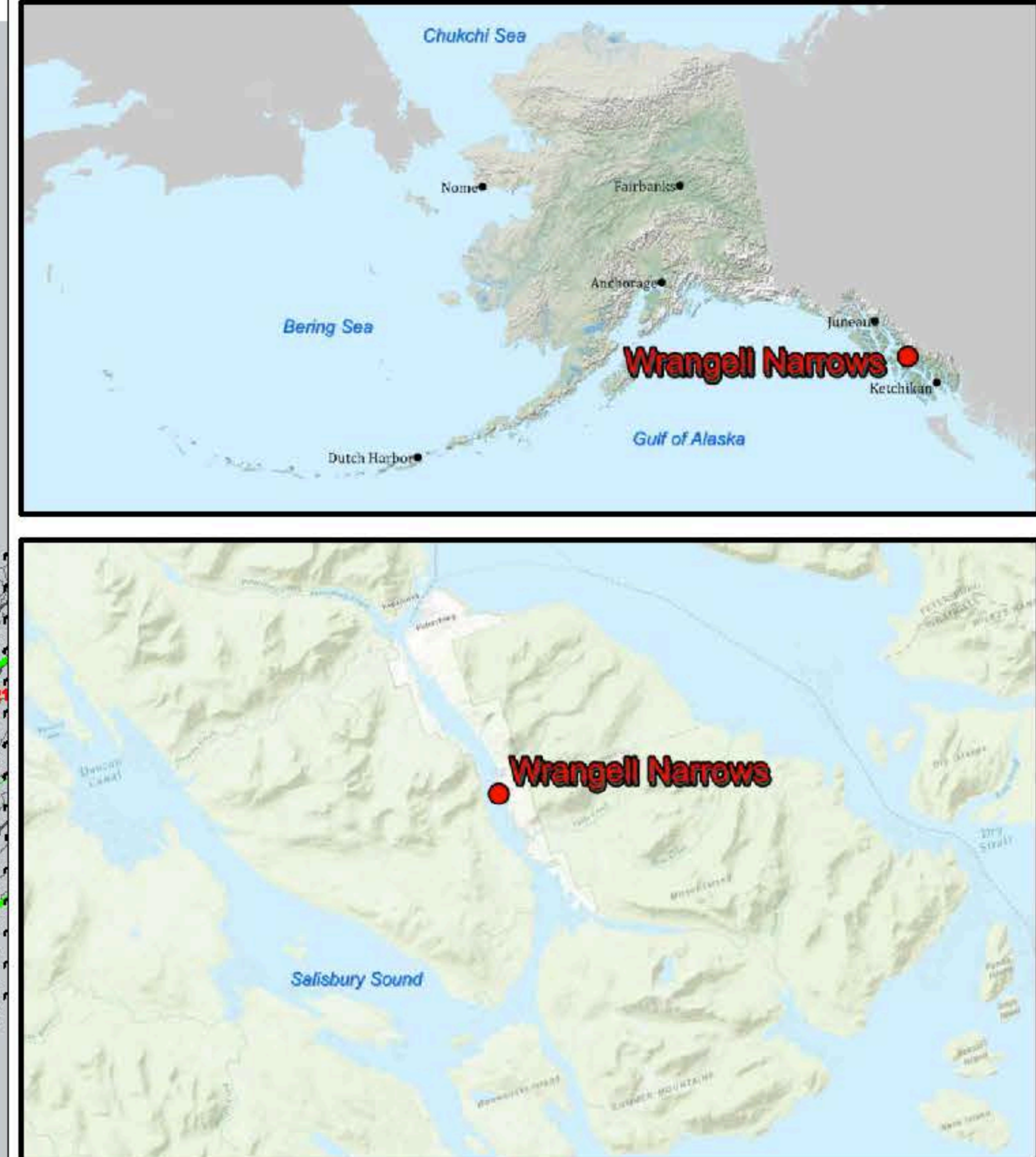


THIS HYDROGRAPHIC SURVEY WAS COMPLETED
UNDER THE OVERSIGHT OF AN ACSM/THSOA
CERTIFIED HYDROGRAPHER



Greg Gibson C.H. (317)

VOLUME COMPUTATIONS: AREA 1		
AREA A	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	5,584
AREA B		
AVAILABLE TO PROJECT DEPTH (PD)	-27.0	50,990
AREA C		
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	4,211

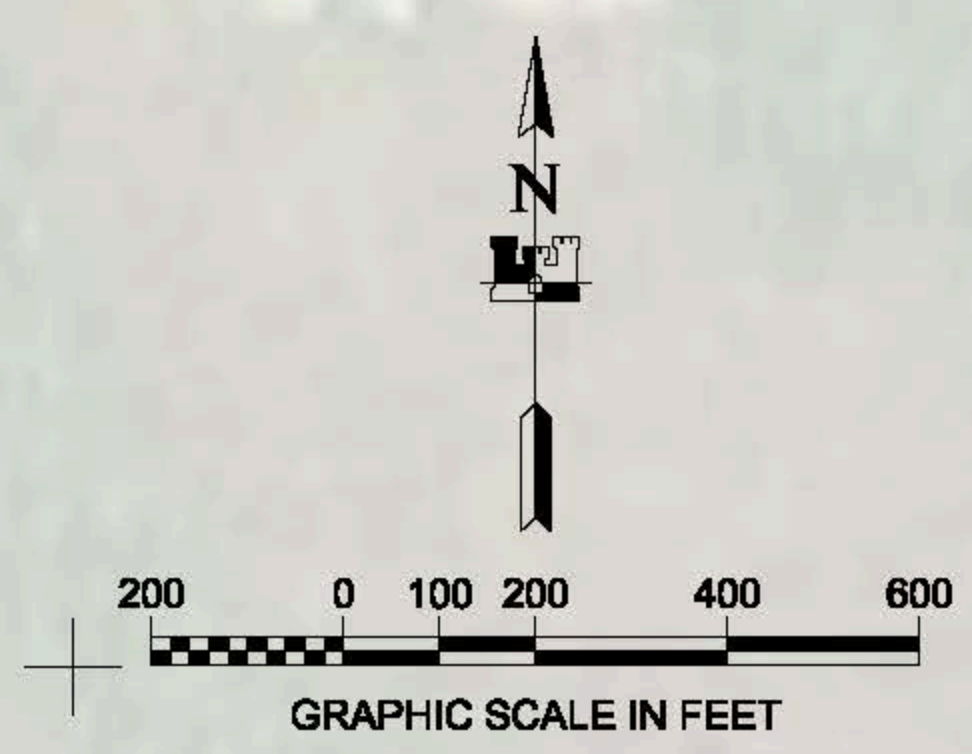


- # NOTES
1. PRIMARY HORIZONTAL CONTROL FOR THE PROJECT IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS86) EPOCH 2003.00, IN US SURVEY FEET, BASED ON A STATIC GPS NETWORK HOLDING THE NGS EPSG 2003.00 CORS AP-VALUES PUBLISHED FOR "LINEAL" WAD 1" (NGS PID 1254007), BOKRA ISLAND 1" (NGS PID AP022) AND LEVEL ISLAND 1" (NGS PID A4400).
- LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS86) EPOCH 2003.00, IN US SURVEY FEET, BASED ON "N 11629 AS N 1,728,214.22; E 2,823,989.35", "1917 U 2007 AS N 1,755,878.70; E 2,824,787.58", "1918 U 2007 AS N 1,778,194.12; E 2,832,285.19" AND "N4-2007 AS N 1,671,520.27; E 2,567,104.91".
2. FOR ALL AREAS VERTICAL CONTROL IS REFERENCED TO MEAN LOWER LOW WATER (MLLW+0.0 FT).
- AREA 1 AND DISPOSAL AREA: MLLW IS BASED ON THE NODANOS TIDAL BENCHMARK SLIP "945 1434 TURN POINT, NODANOS TIDAL BENCHMARK SLIP 1917 U 2007 TIDAL EPOCH, HOLDING NODANOS TIDAL BENCHMARK "945 1434 TIDAL." (VMF18101601RBB30C) AS 27.14 FT.
3. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 123) ELEVATIONS HOLDING NODANAS TIDAL BENCHMARKS: "945 1434 TIDAL." (VMF18101601RBB30C) AS 23.87 FT, "1917 U 2007 AS 11.90 FT AND "1918 U 2007 AS 11.90 FT. (VMF18101601RBB30C) AS 13.79 FT, "VMF17243 AS 13.78 FT, AND "945 1263 TIDAL." (VMF723301RBB32F1) AS 14.37 FT.
4. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
5. BATHYMETRY WAS COLLECTED MAY 4 - MAY 10, 2019. SOUNDINGS WERE COLLECTED USING AN RBNOIC 20022 MULTIBeam ECHOSOUNDER OPERATING AT 200KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN HML, BASED ON SOUND VELOCITY PROBE, POSITIONING AND VERSEL ORIENTATION WERE DETERMINED USING A GPS F204Y POSYAC OBSERVERS IN SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SP8865 GPS RECEIVER SBT AT CONTROL STATION "N4-2007", "1346 C 2003", AND "N 11629". SURVEY DATA WAS COLLECTED USING QINSY I+ AND PROCESSED USING GIMERA 1.61 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING.
6. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
7. MAP SOUNDINGS ARE BINNED AT 48 FT FEET AND ARE SHOAL BINNED. CONTOURS ARE BINNED AT 12 FEET BINNED SHOAL-BASED SOUNDINGS.

SURVEY CONTROL DATA: AREA 1				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1434 A 2006	1,814,207.81	2,823,232.54	27.14	NOAA/NCOS BENCHMARK SBC
NH-A 2000	1,818,325.29	2,827,135.91	25.21	BRASS DISK
WN-1A 1999	1,821,983.61	2,830,057.14	24.19	USACE DOME D BC

PROJECT LIMITS AREA 1		
NAME	NORTHING	EASTING
CL-1	1,824,026.19	2,832,075.30
CL-2	1,816,481.11	2,824,180.54
CL-3	1,817,329.34	2,822,539.30
CL-4	1,816,354.00	2,822,109.73
CL-5	1,814,531.73	2,822,344.25
CL-6	1,807,398.66	2,823,262.24
CL-7	1,804,702.84	2,824,446.70
PL-1	1,823,903.44	2,832,161.52
PL-2	1,818,358.36	2,824,266.78
PL-3	1,817,733.13	2,823,376.59
PL-4	1,815,462.83	2,822,375.86

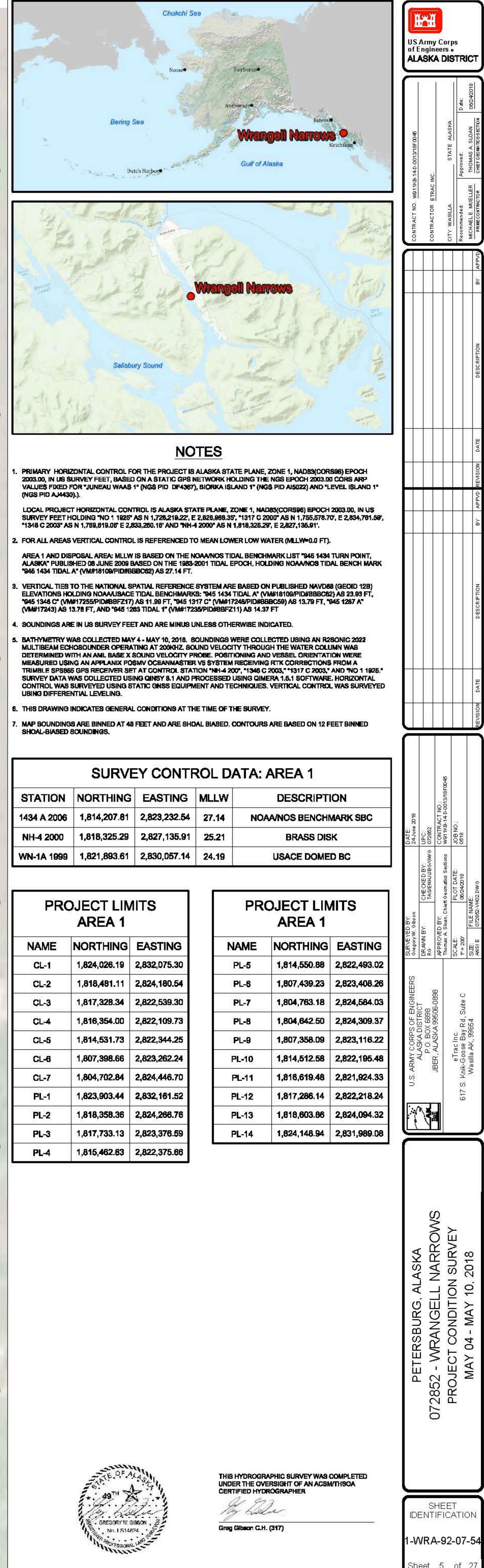
PROJECT LIMITS AREA 1		
NAME	NORTHING	EASTING
PL-5	1,814,550.88	2,822,493.02
PL-6	1,807,439.23	2,823,408.26
PL-7	1,804,763.18	2,824,584.03
PL-8	1,804,842.50	2,824,309.37
PL-9	1,807,358.09	2,823,116.22
PL-10	1,814,512.58	2,822,195.48
PL-11	1,816,619.48	2,821,924.33
PL-12	1,817,286.14	2,822,218.24
PL-13	1,813,803.86	2,824,094.32
PL-14	1,824,148.94	2,831,989.08



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



Greg Gibson C.H. (317)





VOLUME COMPUTATIONS: AREA 1		
AREA A	MLLW=0	CJ. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	5,584
AREA B		
AVAILABLE TO PROJECT DEPTH (PD)	-27.0	50,990
AREA C		
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	4,211



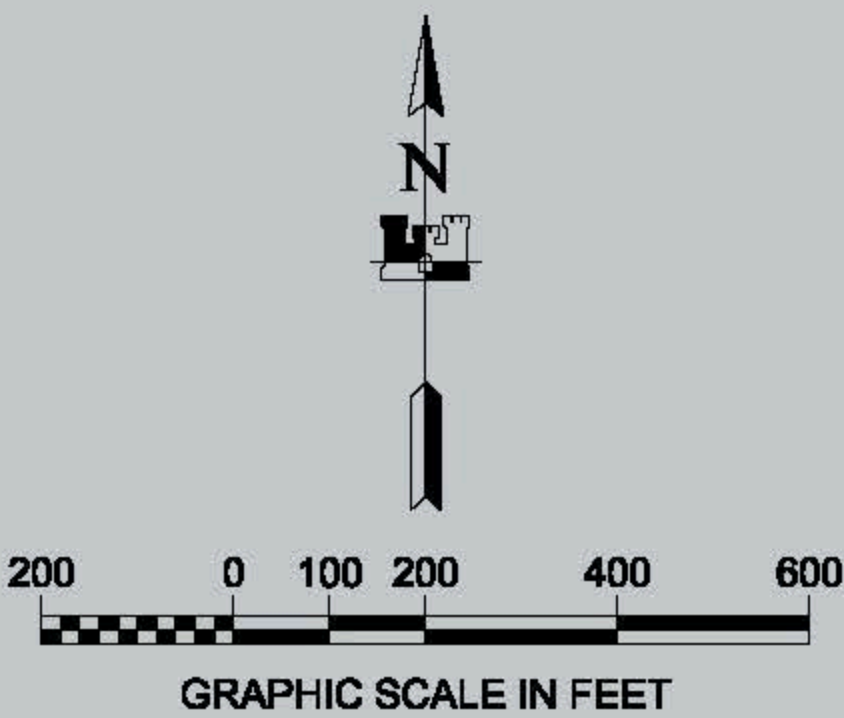
NOTES

1. PRIMARY HORIZONTAL CONTROL FOR THE PROJECT IS ALASKA STATE PLANE, ZONE 1, NAD83(CRS86) EPSG 2003.00, IN US SURVEY FEET, BASED ON A STATIC GPS NETWORK HOLDING THE NGS EPSG 2003.00 CRS# V4490000 FOR "KUNIA WAAS 1" NGS ID# 14787, BOKRA SAND 1" NGS ID# 145322) AND 12" LEVEL (LAND 1" NGS ID# A4430).
2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83(CRS86) EPSG 2003.00, IN US SURVEY FEET HOLDING "N0 14629" AS N 1726.2142"E, 2.628,698" (NS), 137.007 480" AS N 17.65,678.70"E, 2.628,776.70" (NS), 6.0007 480" AS N 17,678.010"E, 2.533,250.1" (NS) AND "N4 4440" AS N 18,136.322"E, 2.627,170.5" (NS).
3. FOR ALL AREAS VERTICAL CONTROL, IS REFERENCED TO MEAN LOWER LOW WATER (MLLW/0'FT).
4. AREA 1 AND DISPOSAL AREA: MLLW IS BASED ON THE NOAA'S TIDAL BENCHMARK SLT 9465 1434 TURN POINT, 11/20/2003, 12/06/2003 BASED ON THE 1984 DATUM. TIDE GAUGE, HOLDING NOAA'S TIDAL BENCH MARK 9465 1434 TIDAL A" (VMF180160FDBB3BCE2) AS 27.14 FT.
5. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (EPOCH 128) ELEVATIONS HOLDING NOAA/TIDAL BENCHMARKS: "9465 1434 TIDAL A" (VMF180160FDBB3BCE2) AS 23.93 FT, "9465 1434 TIDAL B" (VMF180160FDBB3BCE2) AS 11.38 FT, "9465 1434 TIDAL C" (VMF180160FDBB3BCE2) AS 13.79 FT, "VMF17243" AS 13.78 FT, AND "9465 1263 TIDAL A" (VMF17243FDBB3BCE2) AS 14.37 FT.
6. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
7. BATHYMETRY WAS COLLECTED MAY 4 - MAY 16, 2018. SOUNDINGS WERE COLLECTED USING AN ROBOCNC 2022 MULTIBeam ECHOSOUNDER OPERATING AT 200KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN IML BASE X SONIC WAVELENGTH PROFILE. POSITIONING AND VERSEL ORIENTATION WERE DETERMINED USING A GPS TRACKER OBSERVING RTK CORRECTIONS FROM A GPS BASE STATION. A TRIMBLE R5586S GPS RECEIVER SET AT CONTROL STATION "N44 2007" "1346 C 2013" AND "N0 11626" SURVEY DATA WAS COLLECTED USING QINSY 8.1 AND PROCESSED USING QINSY 16.1. BATHYMETRY, HORIZONTAL CONTROL, AND VERTICAL CONTROL, STATIC GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING.
8. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
9. MAP SOUNDINGS ARE BINNED AT 45 FEET AND ARE SHAL-DEP. CONTOURS ARE BASED ON 12 FEET BINNED SHAL-DEP. BASED SOUNDINGS.

SURVEY CONTROL DATA: AREA 1				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1434 A 2006	1,814,207.81	2,823,232.54	27.14	NOAA/NOS BENCHMARK SBC
NH-4 2000	1,818,325.29	2,827,135.91	25.21	BRASS DISK
WN-1A 1999	1,821,993.61	2,830,057.14	24.19	USACE DOMED BC

PROJECT LIMITS AREA 1		
NAME	NORTHING	EASTING
CL-1	1,824,026.19	2,832,075.30
CL-2	1,818,481.11	2,824,180.54
CL-3	1,817,328.34	2,822,539.30
CL-4	1,816,354.00	2,822,109.73
CL-5	1,814,531.73	2,822,344.25
CL-6	1,807,396.66	2,823,262.24
CL-7	1,804,702.84	2,824,446.70
PL-1	1,823,903.44	2,832,161.52
PL-2	1,818,359.36	2,824,266.76
PL-3	1,817,733.13	2,823,376.59
PL-4	1,815,462.83	2,822,375.68

PROJECT LIMITS AREA 1		
NAME	NORTHING	EASTING
PL-5	1,814,550.88	2,822,493.02
PL-8	1,807,439.23	2,824,408.26
PL-7	1,804,763.18	2,824,564.03
PL-8	1,804,842.50	2,824,309.37
PL-8	1,807,358.08	2,823,113.22
PL-10	1,814,512.58	2,822,195.48
PL-11	1,816,619.48	2,821,924.33
PL-12	1,817,286.14	2,822,218.24
PL-13	1,816,803.96	2,824,084.32
PL-14	1,824,148.94	2,831,989.08



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



Greg Gibson C.H. (317)



US Army Corps
of Engineers •
ALASKA DISTRICT

CONTRACT NO. W07H06-140-001318F 0046	
CONTRACTOR: ETRAC INC.	
CITY: WASILLA	STATE: ALASKA
Recommended:	Approved:
MICHAEL E. MUELLER	THOMAS A. SLOAN
PRIME CONTRACTOR	CHIEF ADMINISTRATION SECTION
	Date: 09/24/2018

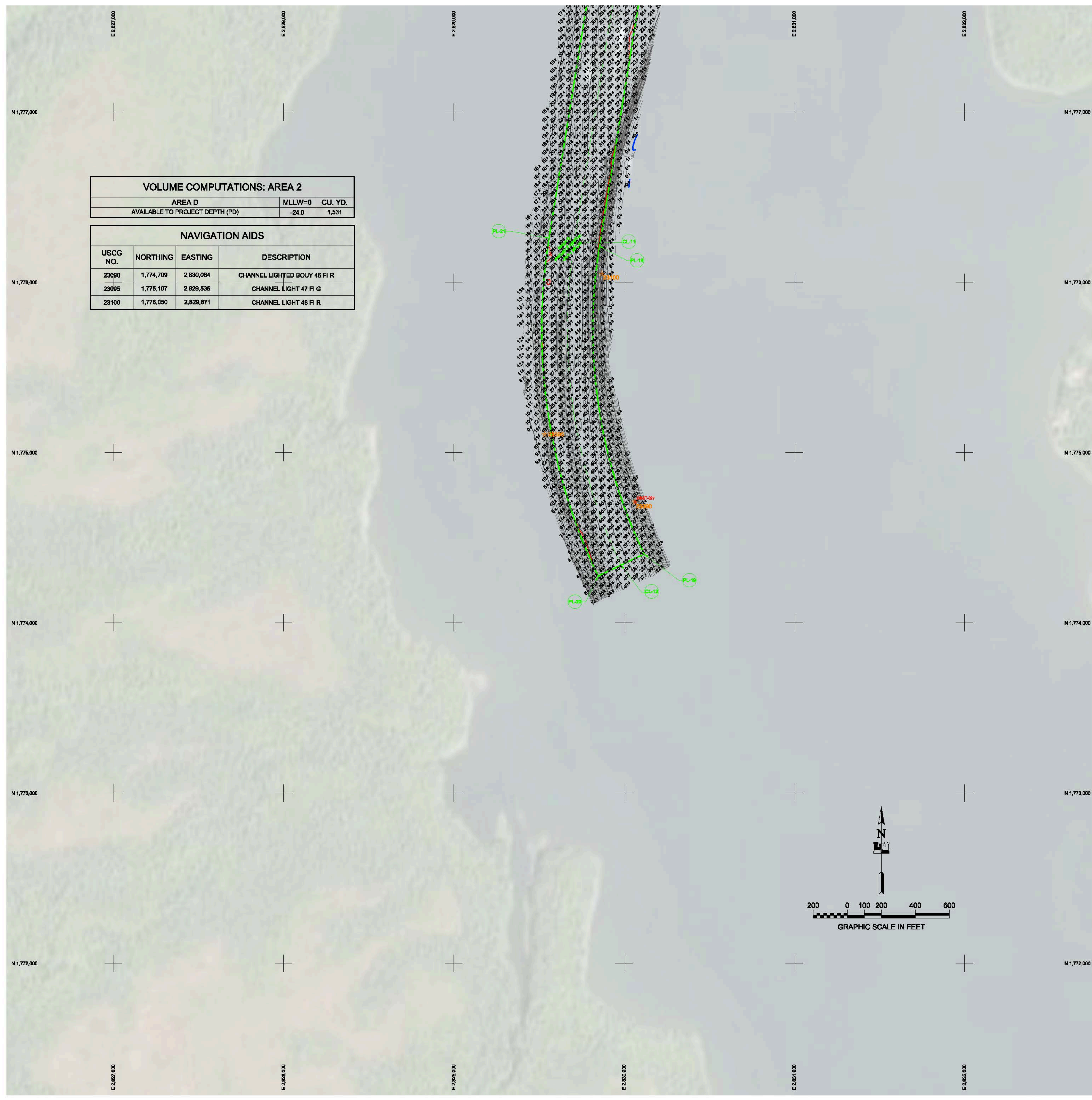
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PETERSBURG, ALASKA
072852 - WRANGELL NARROWS
PROJECT CONDITION SURVEY
MAY 04 - MAY 10, 2018

SHEET
IDENTIFICATION

1-WRA-92-07-54

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NOTES

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SURVEY CONTROL DATA: AREA 2

STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1346 C 2003	1,769,619.06	2,833,260.16	16.17	NOAA/NOS BENCHMARK SBC
WN-1-14	1,782,176.39	2,831,921.02	15.74	USACE DOMED BC
WN-2-14	1,773,422.28	2,833,579.88	17.73	USACE DOMED BC

**PROJECT LIMITS
AREA 2**

NAME	NORTHING	EASTING
CL-8	1,781,237.07	2,829,777.06
CL-9	1,781,078.86	2,829,828.71
CL-10	1,776,311.32	2,830,044.28
CL-11	1,776,235.48	2,829,709.12
CL-12	1,774,339.37	2,829,983.95
PL-15	1,781,283.62	2,829,919.85
PL-16	1,781,125.41	2,829,971.30
PL-17	1,775,287.41	2,830,192.37

**PROJECT LIMITS
AREA 2**

NAME	NORTHING	EASTING
PL-18	1,776,211.57	2,829,857.20
PL-19	1,774,404.34	2,830,119.15
PL-20	1,774,274.40	2,829,848.75
PL-21	1,776,259.39	2,829,561.04
PL-22	1,778,335.22	2,829,896.20
PL-23	1,781,032.31	2,829,686.12
PL-24	1,781,190.52	2,829,634.47



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



Greg Gibson C.H. (317)



US Army Corps
of Engineers •
ALASKA DISTRICT

CONTRACT NO. W911KB-14-D-0013/18F0046	CITY WASILLA STATE ALASKA		D ds: 06/24/2018
CONTRACTOR ETRAC INC.	Recommended	Approved:	
	MICHAEL E. MUELLER	THOMAS A. SLOAN	

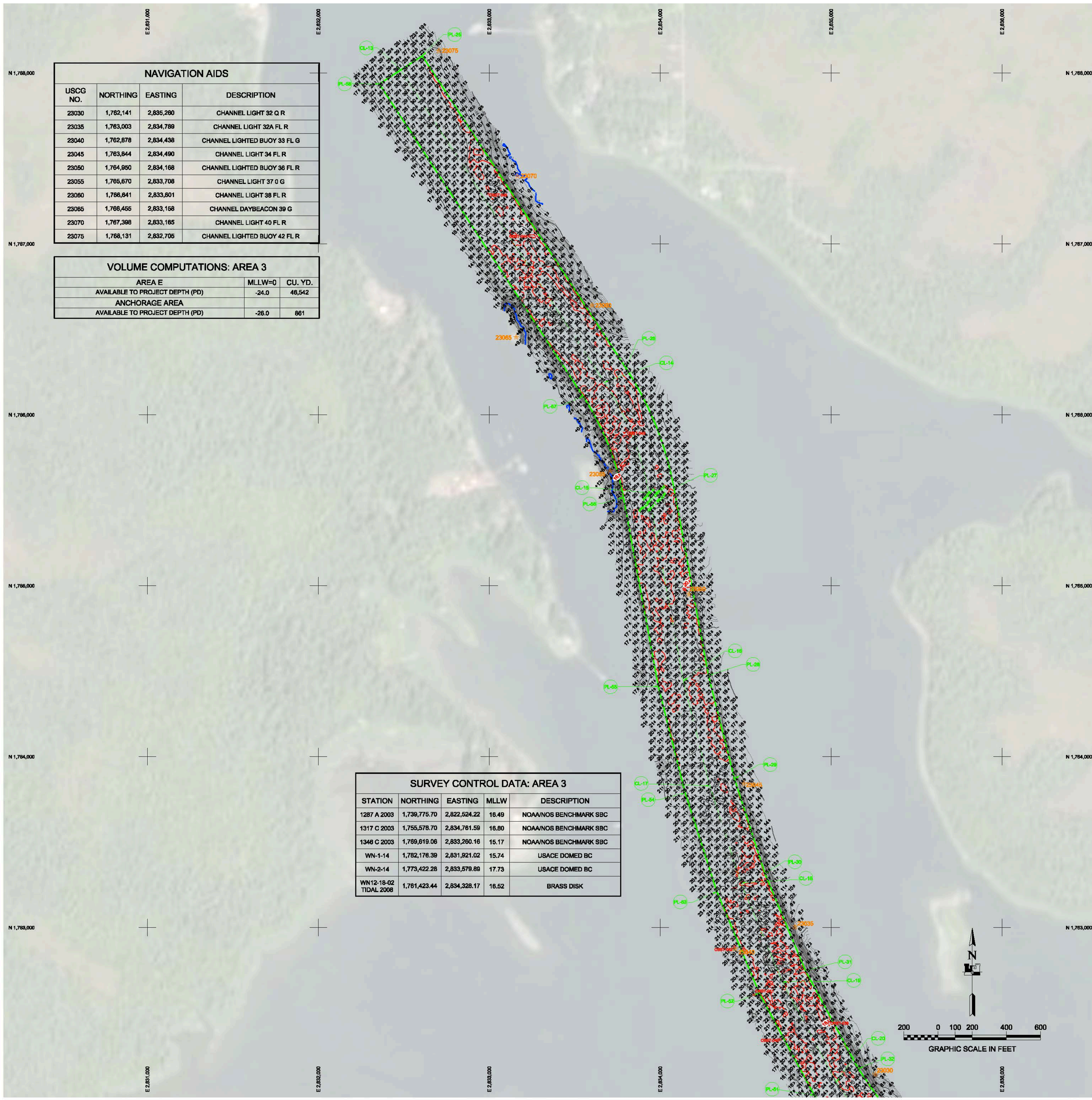
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PETERSBURG, ALASKA
0072852 - WRANGELL NARROWS
PROJECT CONDITION SURVEY
MAY 04 - MAY 10, 2018

SHEET IDENTIFICATION

1-WRA-92-07-54

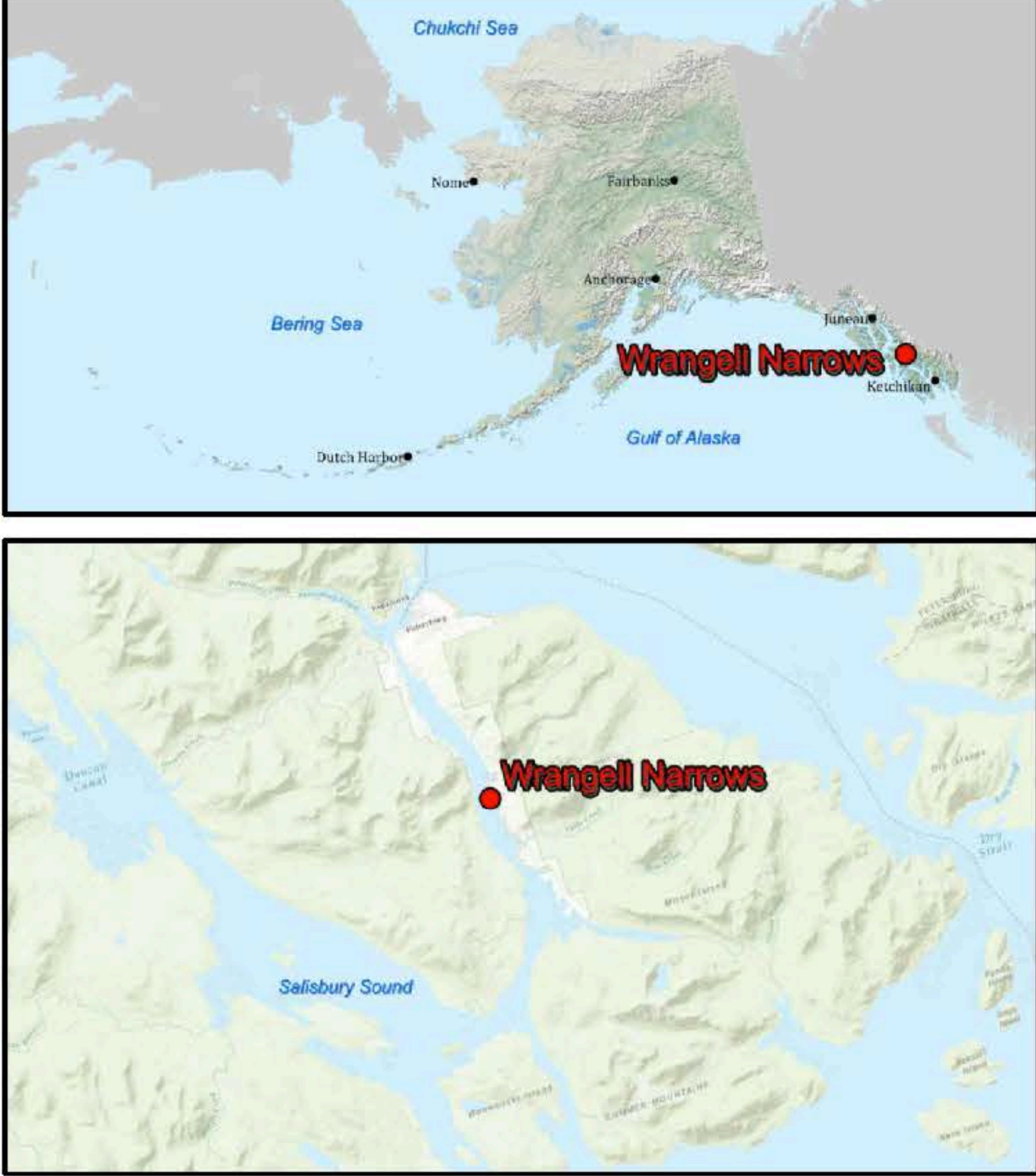
Sheet 8 of 27



NAVIGATION AIDS			
USCG NO.	NORTHING	EASTING	DESCRIPTION
23030	1,762,141	2,835,260	CHANNEL LIGHT 32 Q R
23035	1,763,003	2,834,789	CHANNEL LIGHT 32A FL R
23040	1,762,878	2,834,438	CHANNEL LIGHTED BUOY 33 FL G
23045	1,763,844	2,834,490	CHANNEL LIGHT 34 FL R
23050	1,764,060	2,834,168	CHANNEL LIGHTED BUOY 36 FL R
23055	1,765,670	2,833,708	CHANNEL LIGHT 37 O G
23060	1,766,641	2,833,601	CHANNEL LIGHT 38 FL R
23065	1,766,455	2,833,158	CHANNEL DAYBEACON 39 G
23070	1,767,398	2,833,165	CHANNEL LIGHT 40 FL R
23075	1,768,131	2,832,706	CHANNEL LIGHTED BUOY 42 FL R

VOLUME COMPUTATIONS: AREA 3		
AREA E	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	46,542
ANCHORAGE AREA		
AVAILABLE TO PROJECT DEPTH (PD)	-26.0	861

SURVEY CONTROL DATA: AREA 3				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1287 A 2003	1,739,775.70	2,822,524.22	16.49	NOAA/NOS BENCHMARK SBC
1317 C 2003	1,755,578.70	2,834,781.59	16.80	NOAA/NOS BENCHMARK SBC
1346 C 2003	1,769,619.06	2,833,260.16	15.17	NOAA/NOS BENCHMARK SBC
WN-1-14	1,782,176.39	2,831,921.02	15.74	USACE DOMED BC
WN-2-14	1,773,422.28	2,833,579.89	17.73	USACE DOMED BC
WN12-18-02 TIDAL 2008	1,761,423.44	2,834,328.17	16.52	BRASS DISK



- NOTES**
1. PRIMARY HORIZONTAL CONTROL FOR THE PROJECT IS ALASKA STATE PLANE, ZONE 1, NAD83(CORR88) EPOCH 2003.00, IN US SURVEY FEET, BASED ON A STATIC GPS NETWORK HOLDING THE NOS EPOCH 2003.00 CORRS ARE VALUES FIXED FOR "UNEVAL WAS 1" (NOS PID 0F4367), "BIORKA ISLAND 1" (NOS PID A05022) AND "LEVEL ISLAND 1" (NOS PID A44303).
 2. FOR ALL AREAS VERTICAL CONTROL IS REFERENCED TO MEAN LOWER LOW WATER (MLLW=0.0 FT).
 3. AREA 3: MLLW IS A TILTED PLANE MLLW DATUM BASED ON THE LINEAR INTERPOLATION OF THE DIFFERENCES BETWEEN NAVD83 (GEOID 128) AND MLLW (1983-2001 EPOCH) AT NOAA/NOS TIDAL STATIONS "945 1346 PAPKES LANDING WRANGELL NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 HOLDING NOAA/NOS TIDAL BENCHMARK "945 1346 C" (VMH7256PDI08BSC27) AS 15.17 FT, "945 1317 ANCHOR POINT, WRANGELL NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 HOLDING NOAA/NOS TIDAL BENCHMARK "945 1317 C" (VMH7246PDI08BSC05) AS 16.80 FT, AND "945 1287 A BEECHER PASS, WRANGELL NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 HOLDING NOAA/NOS TIDAL BENCHMARK "945 1287 A" (VMH7243) AS 16.49 FT.
 4. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
 5. BATHYMETRY WAS COLLECTED MAY 4 - MAY 10, 2018. SOUNDINGS WERE COLLECTED USING AN RESONIC 2027 MULTIBeam ECHOSOUNDER OPERATING AT 2000HZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITIONING AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV OCEANMASTER V6 SYSTEM RECEIVING RTX CORRECTIONS FROM A TRIMBLE BRIDGE GPS RECEIVER SET AT CONTROL STATION "945 1200" "1346 C 2003" "1317 C 2003" AND "NO 1 1925" SURVEY DATA WAS COLLECTED USING OMIBY 8.1 AND PROCESSED USING OCEANA 1.5.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING.
 6. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
 7. MAP SOUNDINGS ARE BINNED AT 48 FEET AND ARE SHOAL BIASED. CONTOURS ARE BASED ON 12 FEET BINNED SHOAL-BIASED SOUNDINGS.

PROJECT LIMITS AREA 3		
NAME	NORTHING	EASTING
CL-13	1,768,017.97	2,832,482.73
CL-14	1,766,189.96	2,833,574.79
CL-15	1,765,544.44	2,833,932.84
CL-16	1,764,442.97	2,834,135.50
CL-17	1,763,829.49	2,834,290.41
CL-18	1,763,282.21	2,834,472.23
CL-19	1,762,882.04	2,834,715.01
CL-20	1,762,096.55	2,835,030.36
CL-21	1,761,468.88	2,835,444.25
CL-22	1,759,073.86	2,836,030.75
CL-23	1,756,516.67	2,834,867.39
CL-24	1,752,947.26	2,830,537.48
CL-25	1,749,984.41	2,828,276.34
CL-26	1,745,536.20	2,825,894.45
CL-27	1,742,232.10	2,824,998.11
CL-28	1,740,851.80	2,825,139.35
CL-29	1,738,845.23	2,825,230.15
PL-25	1,768,089.90	2,832,608.38
PL-26	1,766,271.89	2,833,800.44
PL-27	1,765,571.82	2,834,080.16
PL-28	1,764,474.95	2,834,282.13
PL-29	1,763,870.78	2,834,434.69
PL-30	1,763,314.15	2,834,613.10
PL-31	1,762,748.71	2,834,850.55
PL-32	1,762,174.55	2,835,158.72
PL-33	1,761,573.44	2,835,568.22

PROJECT LIMITS AREA 3		
NAME	NORTHING	EASTING
PL-34	1,768,055.78	2,836,179.84
PL-35	1,766,403.18	2,834,765.46
PL-36	1,762,844.08	2,830,847.49
PL-37	1,749,883.09	2,828,402.82
PL-38	1,745,480.27	2,826,034.89
PL-39	1,742,219.75	2,825,148.20
PL-40	1,740,882.84	2,825,289.00
PL-41	1,738,852.01	2,825,380.00
PL-42	1,738,838.45	2,825,080.30
PL-43	1,740,840.86	2,824,989.70
PL-44	1,742,244.45	2,824,844.02
PL-45	1,745,592.13	2,825,754.21
PL-46	1,750,045.73	2,828,149.76
PL-47	1,753,050.44	2,830,427.47
PL-48	1,756,630.16	2,834,569.30
PL-49	1,759,092.15	2,836,881.88
PL-50	1,761,404.54	2,835,320.26
PL-51	1,762,018.55	2,834,902.00
PL-52	1,762,617.37	2,834,579.47
PL-53	1,763,210.27	2,834,331.36
PL-54	1,763,788.20	2,834,146.13
PL-55	1,764,410.99	2,833,968.88
PL-56	1,765,517.26	2,833,785.12
PL-57	1,766,108.03	2,833,549.14
PL-58	1,767,836.04	2,832,357.08



THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ADCMT/ISCA CERTIFIED HYDROGRAPHER

Greg Gibson C.H. (317)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W-92-07-000000
CONTRACTOR: ETAC INC.
CITY: WASILLA
STATE: ALASKA
APPROVED: [Signature]
RECOMMENDED: [Signature]
DATE: MAY 04, 2018

DATE: 24 June 2018
DRAWN BY: [Signature]
CHECKED BY: [Signature]
APPROVED BY: [Signature]
SCALE: 1"=200'
FILE NO.: 10050018
ART I: 10050018-000

DATE: 24 June 2018
DRAWN BY: [Signature]
CHECKED BY: [Signature]
APPROVED BY: [Signature]
SCALE: 1"=200'
FILE NO.: 10050018
ART II: 10050018-000

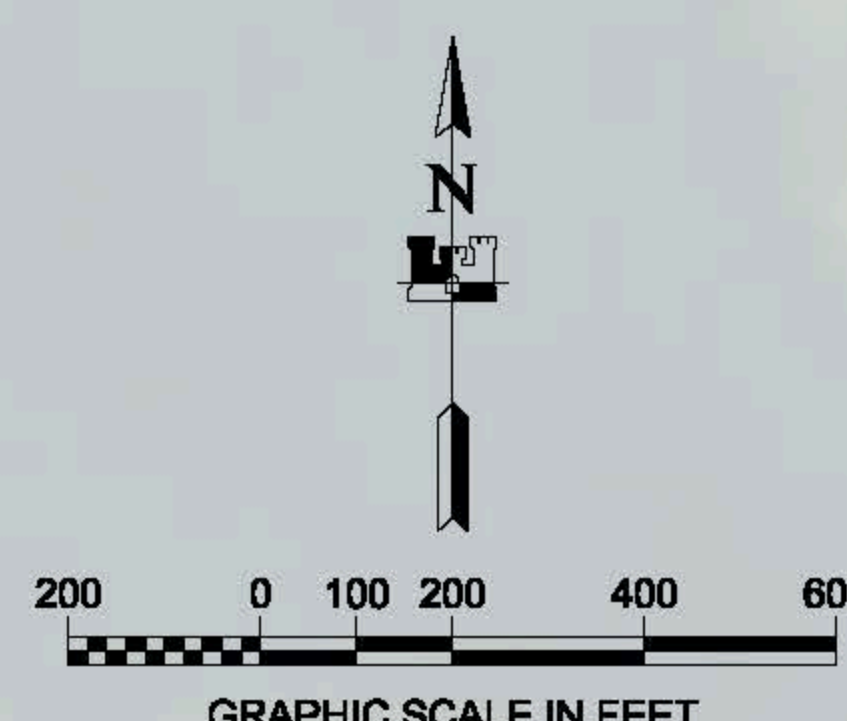
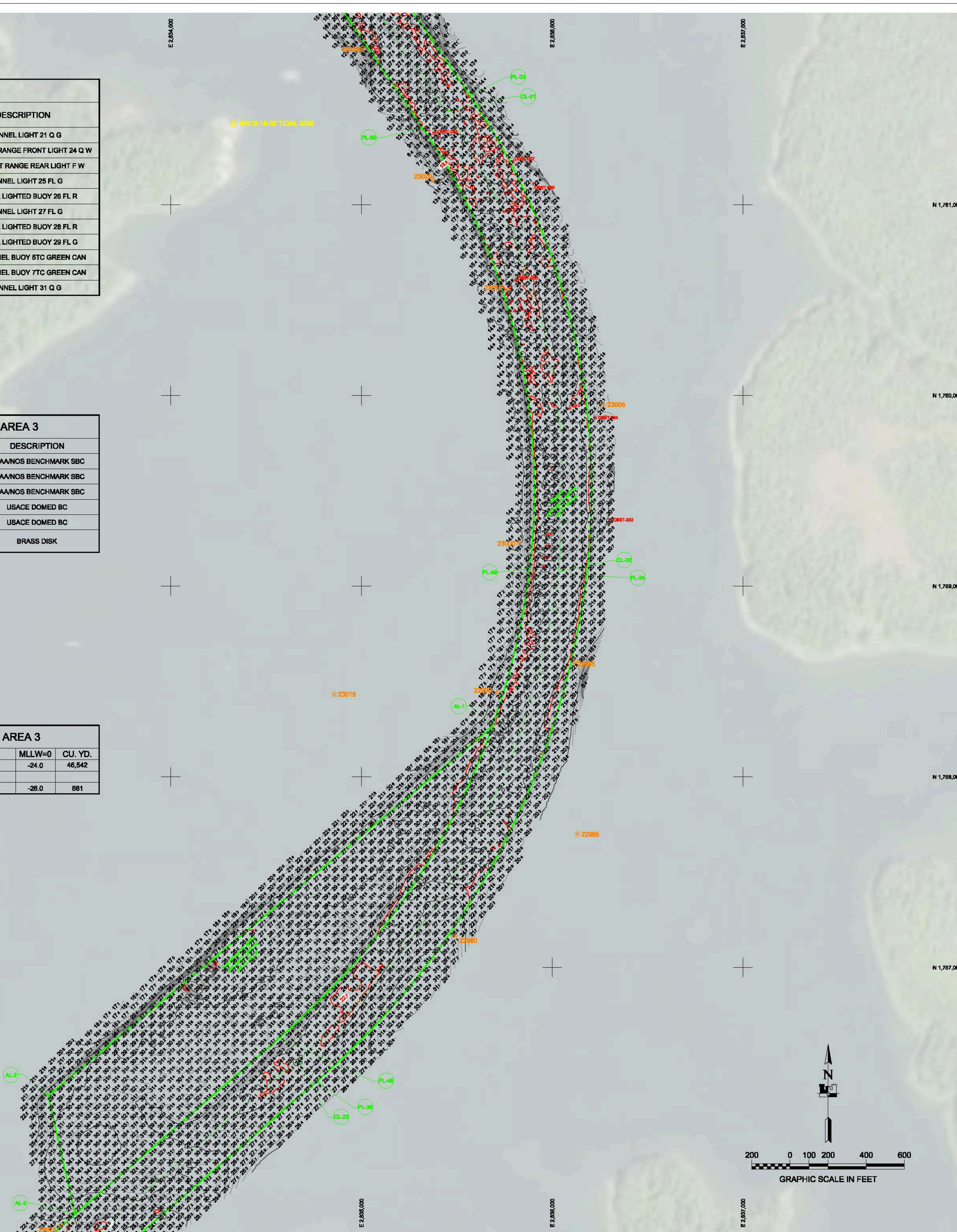
PETERSBURG, ALASKA
072852 - WRANGELL NARROWS
PROJECT CONDITION SURVEY
MAY 04 - MAY 10, 2018

SHEET IDENTIFICATION
1-WRA-92-07-04
Sheet 9 of 27

SURVEY CONTROL DATA: AREA 3				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1287 A 2003	1,739,775.70	2,822,524.22	16.49	NOAA/NOS BENCHMARK SBC
1317 C 2003	1,755,578.70	2,834,761.59	16.80	NOAA/NOS BENCHMARK SBC
1346 C 2003	1,769,619.05	2,833,260.16	15.17	NOAA/NOS BENCHMARK SBC
WN-1-14	1,782,176.39	2,831,921.02	15.74	USACE DOMED BC
WN-2-14	1,773,422.28	2,833,579.89	17.73	USACE DOMED BC
WN12-16-02 TIDAL 2008	1,781,423.44	2,834,328.17	16.52	BRASS DISK

VOLUME COMPUTATIONS: AREA 3		
AREA E	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	46,542
ANCHORAGE AREA		
AVAILABLE TO PROJECT DEPTH (PD)	-26.0	861

PROJECT LIMITS ANCHORAGE AREA		
NAME	NORTHING	EASTING
AL-1	1,758,281.98	2,835,685.88
AL-2	1,756,328.14	2,833,358.12
AL-3	1,755,704.85	2,833,498.69



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



Greg Gibson C.H. (317)

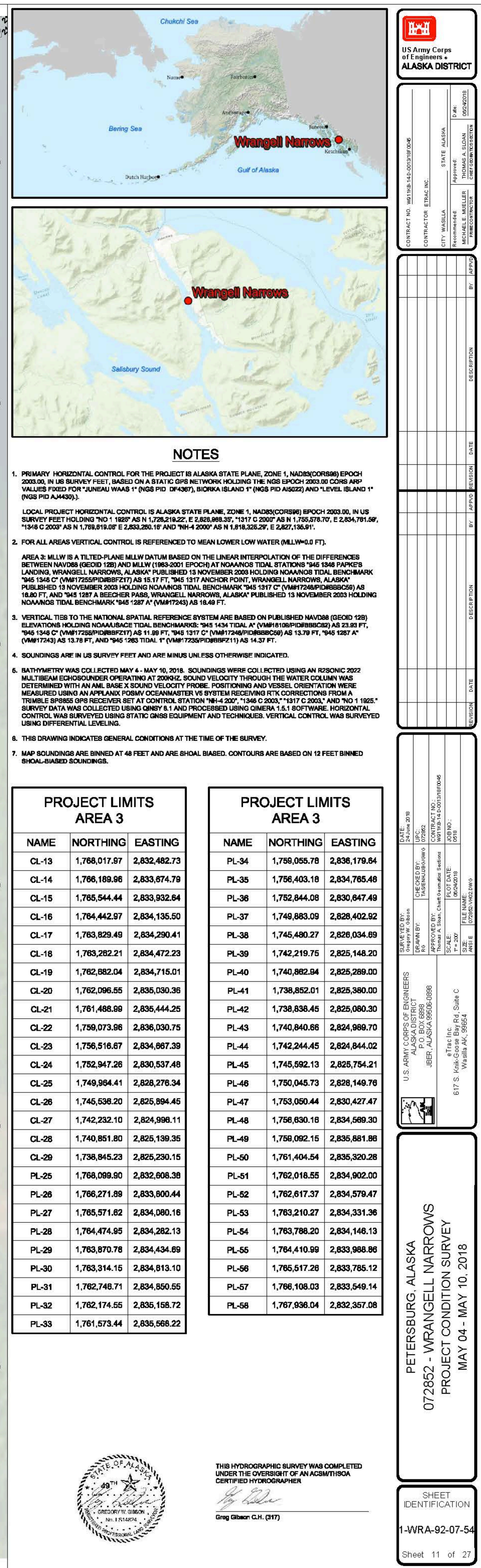


- # NOTES
1. PRIMARY HORIZONTAL CONTROL FOR THE PROJECT IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS86) EPOCH 2000.0, IN US SURVEY FEET, BASED ON A STATIC GPS NETWORK HOLDING THE NGBS EPOCH 2000.0 CORS# AF94 (NAD83 STATE PLANE) W/ALASKA W/1 (NGBS PID 1245007), BODENIA ALASKA W/1 (NGBS PID AF0222) AND LEVEL ISLAND W/1 (NGBS PID A4430).
- LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS86) EPOCH 2000.0, IN US SURVEY FEET, HOLDING NO. 1 16269 AS N 1,728,264.122; E 2,863,985.983; UTM 1970.0 2200W AS N 1,765,578.770; E 2,864,787.56; UTM 12,200W AS N 1,178,152.075; E 2,857,151.170; AND 70M 4200W AS N 1,615,522.027; E 5,657,150.170.
- FOR ALL AREAS SURVEYED CONTROL IS REFERENCED TO MEAN LOW WATER (MLLW)=0.0 FT.
- AREA 3. MLLW IS A TILTED PLANE MLLW DATUM BASED ON THE LINEAR INTERPOLATION OF THE DIFFERENCES BETWEEN THE MLLW DATUM (BENCHMARK) AND THE MLLW DATUM STATIONS "545 1548 PARKERS LANDING, WRANGELL, NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2000 HOLDING NGAOMAS TIDAL BENCHMARK "545 1548 CT (VMMF72501P08B277) AS 13.17 FT, "545 1317 ANCHOR POINT, WRANGELL, NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2000 HOLDING NGAOMAS TIDAL BENCHMARK "545 1317 CT (VMMF72501P08B256) AS 18.00 FT, AND "545 1287 A BEECHER BASIN, WRANGELL, NARROWS, ALASKA" PUBLISHED 13 NOVEMBER 2003 HOLDING NGAOMAS TIDAL BENCHMARK "545 1287 AT (VMMF7243) AS 16.49 FT.
3. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVDARS (GEOID 1928) DATUMS. THE TIES ARE: "545 1548 CT (VMMF72501P08B277) AS 13.17 FT, "545 1317 CT (VMMF7243P08B256) AS 13.78 FT, "545 1287 AT (VMMF7243) AS 13.78 FT, AND "545 1285 TIDAL P (VMMF72501P08B211) AS 14.33 FT.
4. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
5. BATHYMETRY WAS COLLECTED MAY 4 - MAY 10, 2008. SOUNDINGS WERE COLLECTED USING AN RS20NIC 2002 MULTIBeam ECHOSOUNDING OPERATING AT 2000KHZ, SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN ANI ANI 2 SOUND VELOCITY MEASUREMENT, POSITIONING AND VEESSEL ORIENTATION WERE MEASURED USING AN APPLIXAP POSNAV OCEANMASTER V5 SYSTEM RECEIVING RTCP CORRECTIONS FROM A TETHERED SPBBSS GPS RECEIVER SET AT CONTROL STATION 2000.0 1540.0 2200.0 "1517 0.2003" AND "16269.0 2000.0". SURVEY DATA WAS COLLECTED USING QINSY 8.1 AND PROCESSED USING CAMERA 1.5.1; SOFTWARE, HORIZONTAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND TECHNIQUES. WERE FOLLOWING SURVEY USING DIFFERENTIAL LEVELING.
6. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
7. MAP SOUNDINGS ARE BINNED AT 48 FEET AND ARE BSHAL BIASED. CONTOURS ARE BASED ON 12 FEET BINNED

PROJECT LIMITS AREA 3		
NAME	NORTHING	EASTING
CL-13	1,766,017.87	2,832,482.73
CL-14	1,766,189.96	2,833,674.79
CL-15	1,765,544.44	2,833,932.84
CL-16	1,764,442.97	2,834,135.50
CL-17	1,763,829.49	2,834,290.41
CL-18	1,763,282.21	2,834,472.03
CL-19	1,762,682.04	2,834,715.01
CL-20	1,762,096.55	2,836,030.36
CL-21	1,761,488.99	2,835,444.25
CL-22	1,759,073.96	2,836,030.75
CL-23	1,756,516.67	2,834,867.39
CL-24	1,752,947.26	2,836,537.48
CL-25	1,749,984.41	2,828,276.34
CL-26	1,745,536.20	2,825,894.45
CL-27	1,742,232.10	2,826,994.11
CL-28	1,740,851.80	2,825,139.35
CL-29	1,738,845.23	2,825,230.15
PL-25	1,768,069.90	2,832,608.38
PL-26	1,766,271.89	2,833,600.44
PL-27	1,765,571.82	2,834,080.16
PL-28	1,764,474.95	2,834,282.13
PL-29	1,763,870.78	2,834,434.69
PL-30	1,763,314.15	2,834,813.10
PL-31	1,762,746.71	2,834,850.55
PL-32	1,762,174.55	2,836,158.72
PL-33	1,761,573.44	2,835,568.22

PROJECT LIMITS AREA 3		
NAME	NORTHING	EASTING
PL-34	1,759,065.78	2,836,179.54
PL-35	1,756,403.18	2,834,765.46
PL-36	1,752,844.08	2,830,647.49
PL-37	1,749,883.09	2,828,402.92
PL-38	1,745,480.27	2,826,034.69
PL-39	1,742,219.75	2,825,148.20
PL-40	1,740,862.94	2,825,288.00
PL-41	1,738,852.01	2,825,380.00
PL-42	1,738,838.45	2,825,060.30
PL-43	1,740,844.66	2,824,989.70
PL-44	1,742,244.65	2,824,844.02
PL-45	1,745,592.13	2,825,754.21
PL-46	1,750,045.73	2,828,149.76
PL-47	1,753,050.44	2,830,427.47
PL-48	1,756,630.18	2,834,569.30
PL-49	1,756,062.15	2,835,881.88
PL-50	1,761,404.54	2,835,320.28
PL-51	1,762,018.55	2,834,902.00
PL-52	1,762,617.37	2,834,579.47
PL-53	1,763,210.27	2,834,331.36
PL-54	1,763,788.20	2,834,148.13
PL-55	1,764,410.99	2,833,988.88
PL-56	1,765,517.26	2,833,785.12
PL-57	1,766,108.03	2,833,549.14
PL-58	1,767,936.04	2,832,357.08

 PETERSBURG, ALASKA 072852 - WRANGELL NARROWS PROJECT CONDITION SURVEY MAY 04 - MAY 10, 2018		SHEET IDENTIFICATION 1-WRA-92-07-54	
 U.S. ARMY CORPS OF ENGINEERS ALASKA DISTRICT IBER, ALASKA 99506-0388		DATE: 2018 PROJECT NO: 072852	
DRAWN BY: UPC: 145840000000		CHECKED BY: UPC: 145840000000	
DESIGNED BY: Thomas A. Blum, Chief Geomatics Engineer WRANGELL NARROWS 072852		PROJECT NO: 072852	
SCALE: AS SHOWN		FILE NAME: 072852	
817 S. Iliak Road, Suite C Wasilla, AK 99654		DATE: 05-04-2018	

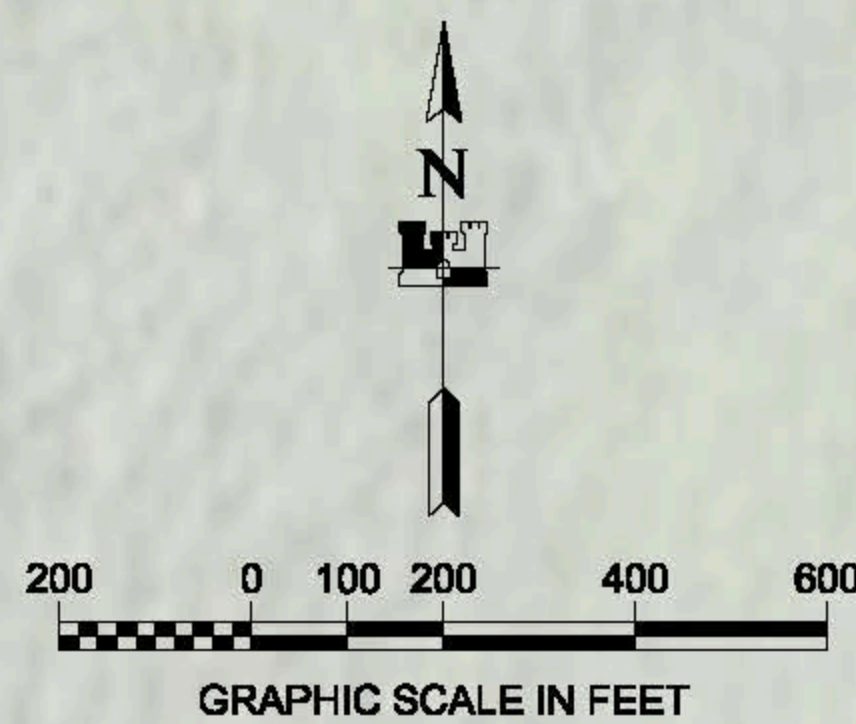


VOLUME COMPUTATIONS: AREA 3		
AREA E	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	46,542
ANCHORAGE AREA		
AVAILABLE TO PROJECT DEPTH (PD)	-26.0	861

SURVEY CONTROL DATA: AREA 3				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
1287 A 2003	1,739,775.70	2,822,524.22	16.49	NOAA/ANOS BENCHMARK SBC
1317 C 2003	1,755,578.70	2,834,761.59	16.80	NOAA/ANOS BENCHMARK SBC
1346 C 2003	1,769,618.06	2,833,260.16	15.17	NOAA/ANOS BENCHMARK SBC
WN-1-14	1,782,176.39	2,831,921.02	15.74	USACE DOME# BC
WN-2-14	1,773,422.28	2,833,579.89	17.73	USACE DOME# BC
WN12-18-02 TIDAL 2008	1,761,423.44	2,834,328.17	16.52	BRASS DISK

PROJECT LIMITS AREA 3		
NAME	NORTHING	EASTING
CL-13	1,768,017.97	2,832,482.73
CL-14	1,766,189.96	2,833,874.79
CL-15	1,765,544.44	2,833,932.64
CL-16	1,764,442.97	2,834,135.50
CL-17	1,763,829.49	2,834,290.41
CL-18	1,763,282.21	2,834,472.23
CL-19	1,762,082.04	2,834,715.01
CL-20	1,762,096.55	2,836,030.36
CL-21	1,761,488.99	2,836,444.25
CL-22	1,759,073.96	2,836,030.75
CL-23	1,756,516.67	2,834,867.39
CL-24	1,752,947.26	2,830,637.48
CL-25	1,749,994.41	2,828,278.34
CL-26	1,745,636.20	2,826,994.45
CL-27	1,742,232.10	2,824,996.11
CL-28	1,740,851.80	2,825,139.35
CL-29	1,738,845.23	2,826,230.15
PL-25	1,768,098.90	2,832,608.39
PL-26	1,768,271.89	2,833,800.44
PL-27	1,765,571.82	2,834,080.16
PL-28	1,764,474.95	2,834,282.13
PL-29	1,763,870.78	2,834,434.69
PL-30	1,763,314.15	2,834,813.10
PL-31	1,762,748.70	2,834,850.65
PL-32	1,762,174.55	2,836,158.72
PL-33	1,761,573.44	2,836,568.22

PROJECT LISTS AREA 3		
NAME	NORTHING	EASTING
PL-34	1,756,055.78	2,836,179.84
PL-35	1,756,403.18	2,834,765.48
PL-36	1,752,844.08	2,830,847.49
PL-37	1,749,885.09	2,828,402.92
PL-38	1,745,490.27	2,826,034.69
PL-39	1,742,219.75	2,825,148.29
PL-40	1,740,862.94	2,825,289.00
PL-41	1,738,852.01	2,825,380.00
PL-42	1,738,836.45	2,825,060.30
PL-43	1,740,840.66	2,824,989.70
PL-44	1,742,244.45	2,824,844.02
PL-45	1,745,592.13	2,825,754.21
PL-46	1,750,045.73	2,828,149.76
PL-47	1,763,050.44	2,830,427.47
PL-48	1,756,830.18	2,834,569.30
PL-49	1,759,092.15	2,835,881.88
PL-50	1,761,404.54	2,836,320.28
PL-51	1,762,016.55	2,834,902.00
PL-52	1,762,617.37	2,834,579.47
PL-53	1,763,210.27	2,834,331.36
PL-54	1,763,788.20	2,834,146.13
PL-55	1,764,410.59	2,833,988.86
PL-56	1,765,617.28	2,833,785.12
PL-57	1,766,108.03	2,833,549.14
PL-58	1,767,938.04	2,832,357.08

[illegible]

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



Grog Gibson C.H. (317)

CONTRACT NO. W5-THB-143-001-318F-0046	CITY WASILLA	STATE ALASKA	Date: 06/22/2018
CONTRACTOR ETAC INC.	Recommended	Approved: THOMAS A. SLOAN CHIEF GOVERNMENT AFFAIRS	
	MICHAEL E. MUELLER PUBLIC CONTRACTOR		

[illegible]

	U.S. ARMY CORPS OF ENGINEERS		SUBMITTER'S OFFICE	DATE
	ATTENTION: ASST. DIR. FOR ACQUISITION P.O. BOX 6889 JERF, ALA 36506-0888		Supply/Stock Office	24 June 2018
		DESN BY:	CHECKED BY:	UPD BY:
		APPROVED BY:		
		CONTRACT NO:		
		WTRN 14-00109106		
		JOHN NO:		
		0018		
		SCALE:		
		PLOT DATE:		
		DATE:		
		FILE NAME:		
		070545.MXD.DWG		
		eTrac Inc.		
		617 S. Main-Great Bay Rd, Suite C		
		Weston MA, 02554		

PETERSBURG, ALASKA
2852 - WRANGELL NARROWS
PROJECT CONDITION SURVEY
MAY 04 - MAY 10, 2018

SHEET IDENTIFICATION

1-WRA-92-07-54

VOLUME COMPUTATIONS: AREA 3		
AREA E	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	46,542
ANCHORAGE AREA		
AVAILABLE TO PROJECT DEPTH (PD)	-26.0	881

A map of Alaska showing the location of Wrangell Narrows. The map includes labels for the Chukchi Sea, Bering Sea, Gulf of Alaska, and Dutch Harbor. It also marks the locations of Nome, Fairbanks, Anchorage, and Ketchikan. Wrangell Narrows is highlighted with a red dot and labeled in red text.

[illegible][illegible]

PROJECT LIMITS AREA 3		
NAME	NORTHING	EASTING
PL-34	1,756,055.78	2,836,179.84
PL-35	1,756,403.18	2,834,785.48
PL-36	1,752,844.08	2,830,844.08
PL-37	1,749,883.09	2,828,402.92
PL-38	1,745,480.27	2,826,034.69
PL-39	1,742,219.75	2,825,148.20
PL-40	1,740,882.94	2,825,289.00
PL-41	1,738,852.01	2,825,380.00
PL-42	1,738,838.45	2,825,080.30
PL-43	1,740,840.66	2,824,989.70
PL-44	1,742,244.45	2,830,844.08
PL-45	1,745,592.13	2,825,754.21
PL-46	1,750,045.73	2,828,149.78
PL-47	1,753,050.44	2,830,427.47
PL-48	1,756,830.18	2,834,689.30
PL-49	1,756,092.15	2,835,881.98
PL-50	1,761,404.54	2,835,320.28
PL-51	1,762,018.55	2,834,002.00
PL-52	1,762,617.37	2,834,579.47
PL-53	1,763,210.27	2,834,331.36
PL-54	1,763,788.20	2,834,146.13
PL-55	1,764,410.99	2,833,988.86
PL-56	1,765,517.26	2,833,785.12
PL-57	1,766,108.03	2,833,549.14
PL-58	1,767,936.04	2,832,357.08

 US Army Corps of Engineers • ALASKA DISTRICT	
CONTRACT NO. <u>W6192B-14L-000319107-0006</u>	
CONTRACTOR <u>ETAC INC.</u>	
CITY <u>WASILLA</u>	STATE <u>ALASKA</u>
Recommended Approved: <u>MICHAEL E. MUELLER</u>	Date: <u>06/27/2015</u>
PRIME CONTRACTOR	CDE/CDM/IC/SECTION

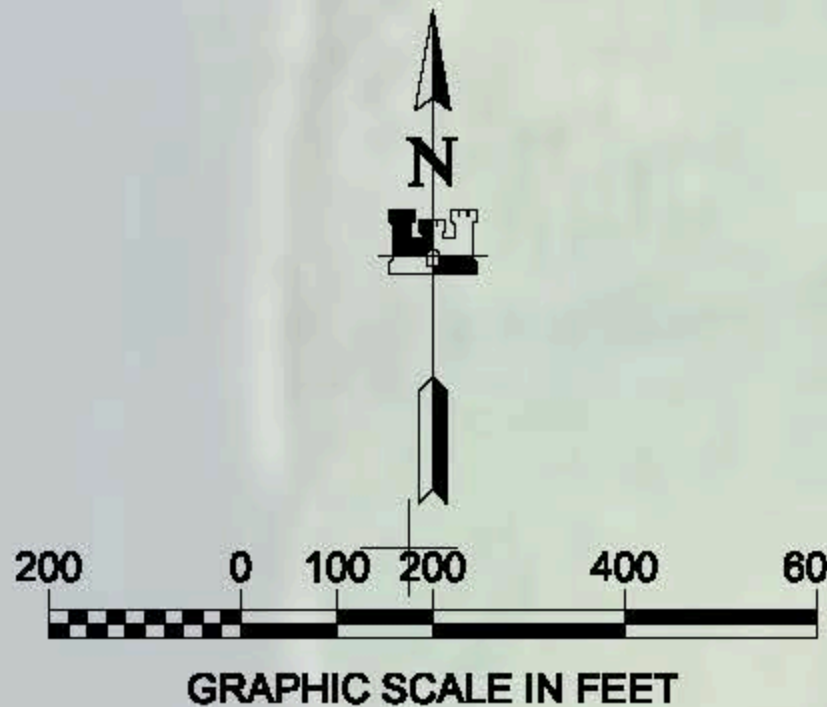
[illegible]

	U.S. ARMY CORPS OF ENGINEERS 617 S. Kings Highway Marietta, GA 30064		APPROVED BY: _____ SPECIAL AGENT IN CHARGE		DATE: _____
	RECEIVED BY: _____ SPECIAL AGENT IN CHARGE		CHECKED BY: _____ SPECIAL AGENT IN CHARGE		DATE: _____
JBER, ALA 35896-0288		CONTRACT NO.: _____ JABNO.: _____ JABNO.: _____		DATE: _____	

PETERSBURG, ALASKA
072852 - WRANGELL NARROWS
PROJECT CONDITION SURVEY
MAY 04 - MAY 10, 2018

SHEET
IDENTIFICATION
1-WRA-92-07-54
Sheet 13 of 27

VOLUME COMPUTATIONS: AREA 4		
AREA F	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-24.0	314



- # NOTES
1. PRIMARY HORIZONTAL CONTROL FOR THE PROJECT IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS86) EPOCH 2003.00, IN US SURVEY FEET, BASED ON A STATIC GPS NETWORK HOLDING THE NGPS EPOCH 2003.00 CORS RNP VALUES PERIOD FOR JUNEAU WAAS 1" (NGS PID 354367), BICKERLAND ZONE 1" (NGS PID A522) AND LEVEL SLIDE 1" (NGS PID A4405).
2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83(CORS86) EPOCH 2003.00, IN US SURVEY FEET HOLDING NAD 1° 12'25" N, 172°54'12" E, 2,862,883.951 FT, 137°12' 00" N, 175°55'27.87" E, 2,834,787.15" W, 151°46' 00" N, 176°59'10.8" E, 2,835,280.10" W AND 704° 40'00" N, 151°16,320" E, 2,821,136.91".
3. FOR ALL AREAS VERTICAL CONTROL IS REFERENCED TO MEAN LOWER LOW WATER (MLLW(0 FT)).
4. AREA 4: MLLW IS BASED ON THE INDOANOS TIDAL BENCHMARK LIST #45 1263 POINT LOCKWOOD, WRANGELL, NARROWS, ALASKA PUBLISHED 15 NOVEMBER 2003 BASED ON THE 1983-2001 TIDAL EPOCH, HOLDING NAOSNOS TIDAL BENCHMARK LIST #45 1263 POINT LOCKWOOD (VNM17236) AT 13.79 FT, "45 13.79 FT".
5. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 1928) ELEVATIONS HOLDING NAOSNAAS TIDAL BENCHMARKS: "45 1434 TIDE 1" (VNM161810PDBHQB3C) AT 23.93 FT, "46 1346 C" (VNM17235PDBHBF74) AT 11.98 FT, "46 1317 C" (VNM161846PDBHQB3C) AT 13.79 FT, "46 1327 FT" (VNM17243) AT 13.79 FT, AND "46 1263 TIDE 1" (VNM17233PDBHBF71) AT 14.37 FT.
6. SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
7. BATHYMETRY WAS COLLECTED MAY 4 - MAY 10, 2018. SOUNDINGS WERE COLLECTED USING AN RCONIC ZW2 MULTIBeam ECHOSOUNDER OPERATING AT 200KHZ, SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED USING SOUND VELOCITY SOUNDING, REFRACTION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLIXAUX POSING OCEANMASTER VS4 SYSTEM RECEIVING RTT CORRECTIONS FROM A TRIMBLE F550S GPS REFLECTOR SET AT COASTAL STATION "N4-207", 154M C ZOD, 154° 00' 00" E, 160° 55' 00" W. SURVEY DATA WAS COLLECTED USING QINSY1 AND PROCESSED USING GEMSA 1.5.1, BOTTWOMER. HORIZONTAL CONTROL WAS SURVEYED USING STATIC GNSS EQUIPMENT AND TECHNIQUES. VERTICAL WAS SURVEYED USING DIFFERENTIAL LEVELING.
8. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
9. MAP SOUNDINGS ARE BINNED AT 48 FEET AND ARE SH-SD. BOUNDARIES ARE BASED ON 12 FEET BINNED

SURVEY CONTROL DATA: AREA 4				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
NO 1 1925	1,726,219.22	2,826,988.35	17.12	USC&GS BRASS DISK
USE 84 1910	1,728,028.19	2,826,548.78	18.02	USC&GS BRASS DISK
WN 20-05	1,733,533.58	2,826,162.75	14.14	BRASS DISK

PROJECT LIMITS AREA 4		
NAME	NORTHING	EASTING
CL-30	1,730,461.97	2,825,781.43
CL-31	1,728,480.06	2,827,295.29
PL-59	1,730,553.02	2,825,900.83
PL-60	1,728,571.11	2,827,414.48
PL-61	1,728,389.01	2,827,178.09
PL-62	1,730,370.82	2,825,662.23

[illegible]

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UNDER THE OVERSIGHT OF AN ACSM/THSOA
CERTIFIED HYDROGRAPHER



Greg Gibson C.H. (317)