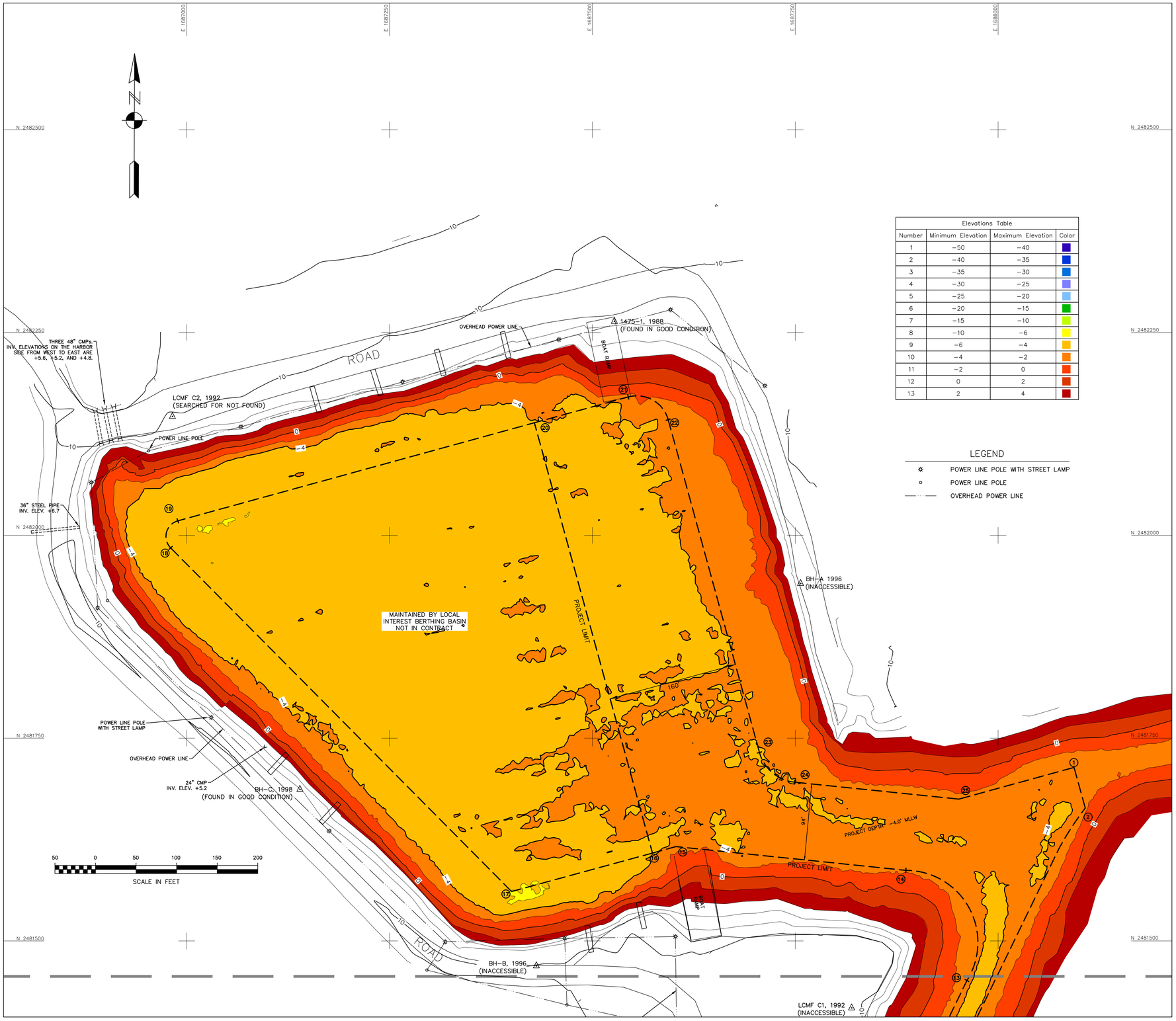
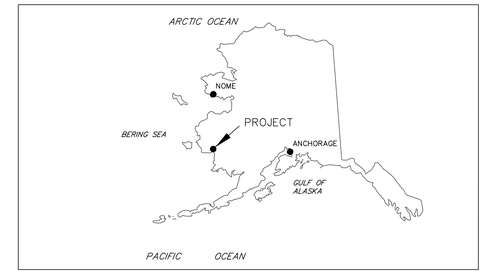


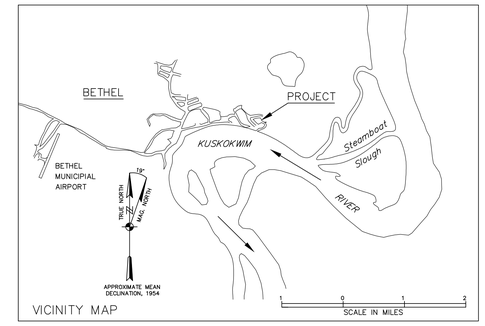
Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	−50	−40	
2	−40	−35	
3	−35	−30	
4	−30	−25	
5	−25	−20	
6	−20	−15	
7	−15	−10	
8	−10	−6	
9	−6	−4	
10	−4	−2	
11	−2	0	
12	0	2	
13	2	4	

LEGEND

- POWER LINE POLE WITH STREET LAMP
- POWER LINE POLE
- OVERHEAD POWER LINE



LOCATION MAP



VICINITY MAP

NOTES

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STATION	NORTHING	EASTING	MLLW	NAVD88	DESCRIPTION
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LCMF C2 1992*	N 2,482,146	E 1,686,982	----	----	3" ALUM. CAP
BH–A 1996*	N 2,481,940	E 1,687,756	----	----	2.5" ALUM. CAP
BH–B 1996*	N 2,481,469	E 1,687,431	----	----	2.5" ALUM. CAP
BH–C 1998	N 2,481,686.86	E 1,687,139.66	6.55'	13.91'	3" ALUM. CAP
BH–D 1998	N 2,481,244.34	E 1,687,288.37	8.49'	15.85'	3" ALUM. CAP
BH–E 2001	----	----	----	----	DESTROYED
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*NOTE: COORDINATES AND ELEVATIONS FOR THESE MONUMENTS HAVE NOT BEEN UPDATED BECAUSE THEY WERE INACCESSIBLE AT THE TIME OF THE SURVEY.

PROJECT LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
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2	1688107.4	2481663.8	15	1687602.9	2481616.3
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7	1687098.7	2480706.3	20	1687428.5	2482138.8
8	1687070.5	2480719.2	21	1687544.2	2482170.6
9	1687178.0	2480953.3	22	1687593.4	2482142.6
10	1687314.0	2481053.9	23	1687705.9	2481732.3
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12	1687834.4	2481189.4	25	1687951.6	2481674.8
13	1687961.6	2481451.2			

VOLUME COMPUTATIONS	
VOLUME AVAILABLE TO PROJECT DEPTH (−4 FT)	1,471 cy
VOLUME AVAILABLE BETWEEN PROJECT DEPTH (−4 FT) AND MAX–PAY DEPTH (−6 FT)	11,031 cy
VOLUME AVAILABLE ALONG SIDE SLOPES	420 cy
TOTAL VOLUME AVAILABLE	12,922 cy

STATE OF ALASKA
49TH
JACK S. HUGHES
LS-4915
REGISTERED PROFESSIONAL LAND SURVEYOR

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB–10–D–0005
CONTRACTOR HUGHES AND ASSOCIATES
CITY WASILLA STATE AK
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Approv

Date: 01/31/11
Dwg Scale: 1" = 50'
Plot Scale:
File:
Drawing #:
Section:
Branch:
Designed:
Drawn: REH
Reviewed: CSH
Chief:
Checked:
Chief:

2859–11

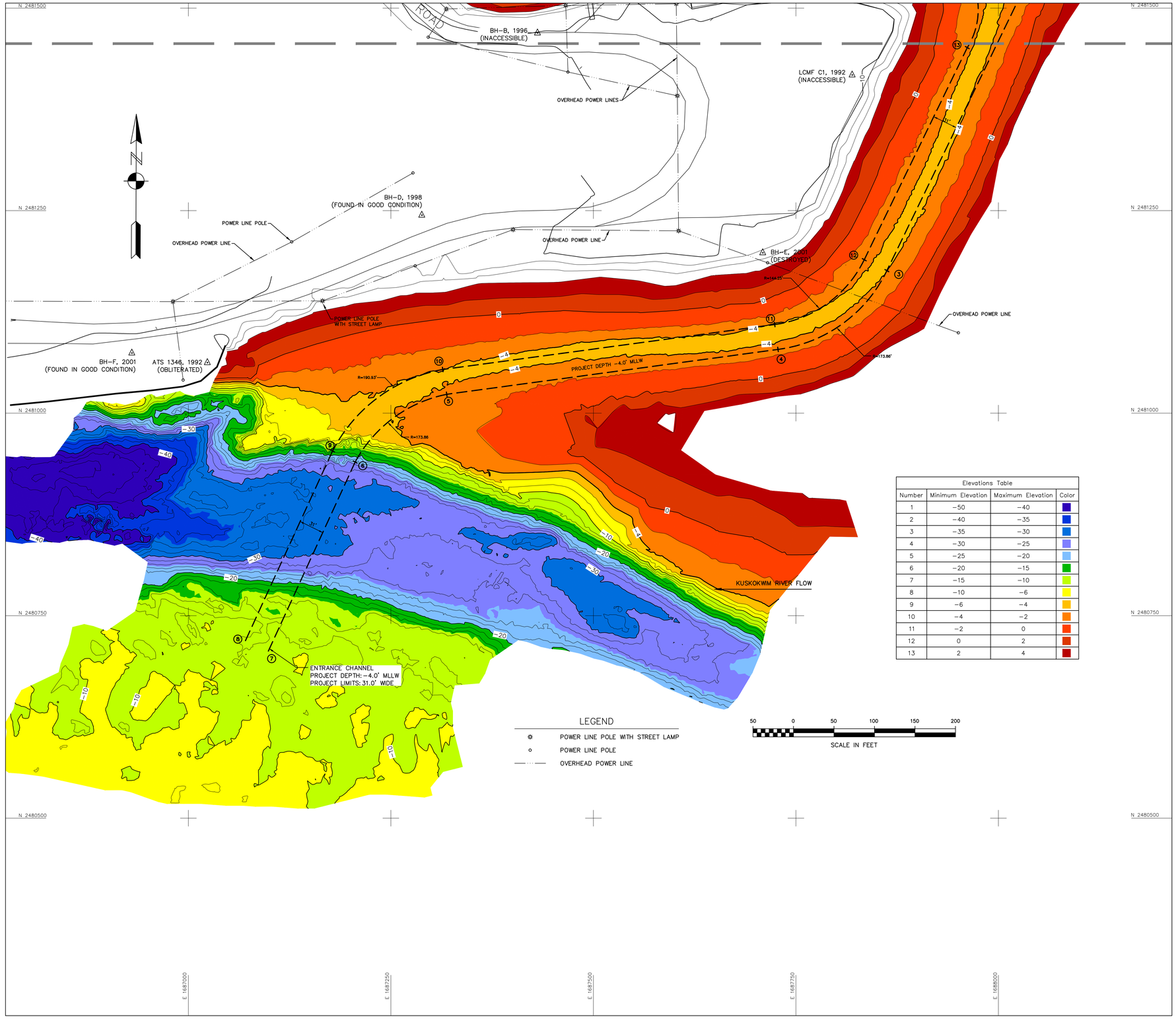
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

BETHEL ALASKA
BETHEL HARBOR
CONDITION SURVEY
OCTOBER 15–19, 2010

Reference number:

Sheet 3 of 4

CORPS OF ENGINEERS



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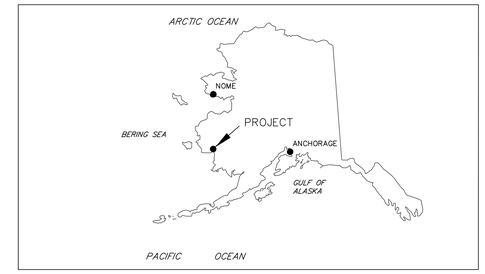
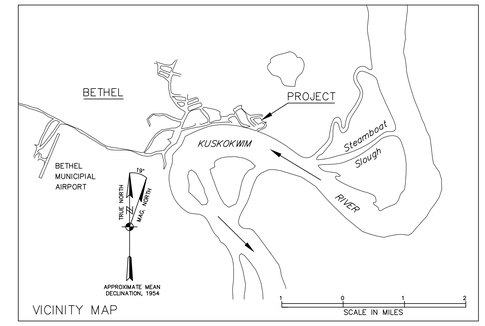


LOCATION MAP



VICINITY MAP

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STATE OF ALASKA 49TH JACK S. HUGHES LS-4915 REGISTERED PROFESSIONAL LAND SURVEYOR

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB–10–D–0005
CONTRACTOR HUGHES AND ASSOCIATES
CITY WASILLA STATE AK
Recommended: Approved: Date:
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Date: 01/31/11
Dwg Scale: 1" = 50'
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Designed:
Drawn: REH
Reviewed: CSH
Chief:
Submitted:
Chief:

2859–11

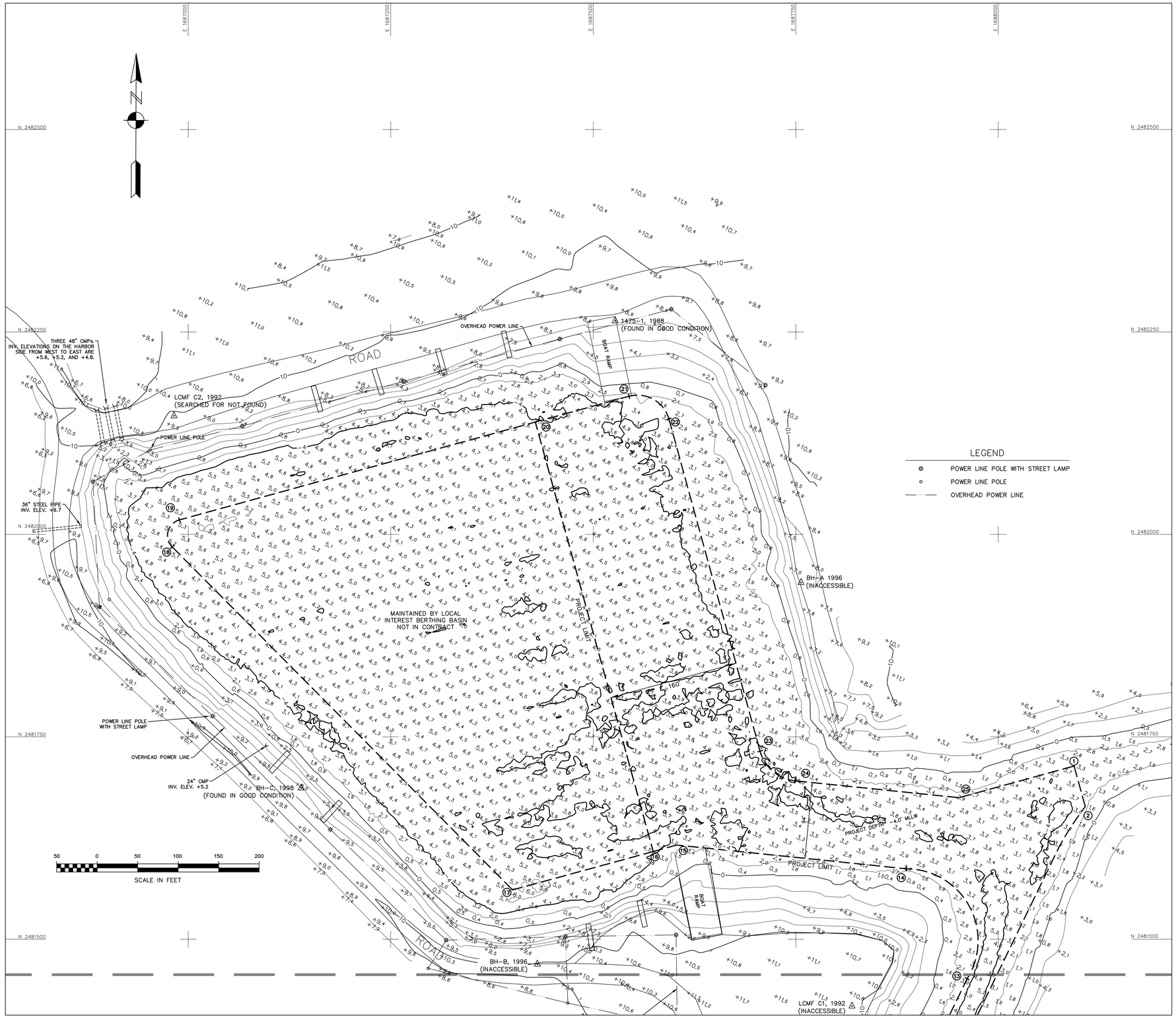
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

BETHEL, ALASKA
BETHEL HARBOR
CONDITION SURVEY
OCTOBER 15–19, 2010

Reference number:

Sheet 4 of 4

CORPS OF ENGINEERS



LEGEND

- POWER LINE POLE WITH STREET LAMP
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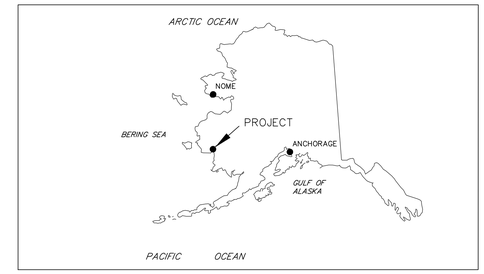
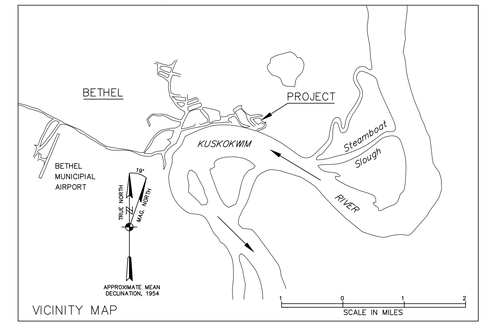


LOCATION MAP



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Chief:
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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

BETHEL, ALASKA
BETHEL HARBOR
CONDITION SURVEY
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Sheet 1 of 4

LEGEND

- POWER LINE POLE WITH STREET LAMP
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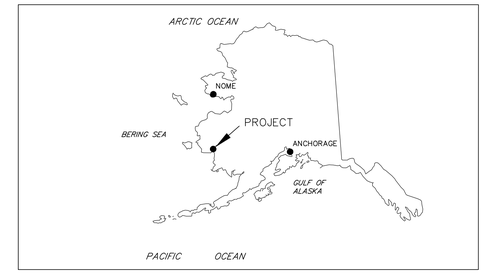
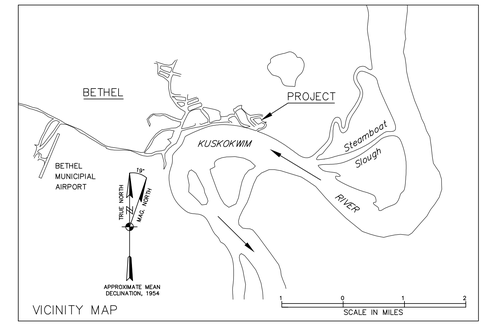


LOCATION MAP



VICINITY MAP

NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 7, 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: "BETHEL WAAS CORS ARP" (BET1 – PID DK4091) AS N 2,479,918.61, E 1,668,701.88 (ALASKA STATE PLANE, ZONE 7, NAD 83) AND "PLATINUM_AK2007 CORS ARP" (AB12 – PID DL6672) AS N 1,808,542.08, E 1,688,330.95 (ALASKA STATE PLANE, ZONE 7, NAD 83) AND "DILLINGHAMAK2007 CORS ARP" (AB14 – PID DL6426) N 1,867,636.73, E 1,435,266.61 (ALASKA STATE PLANE, ZONE 6, NAD 83). CORS STATIONS STATE PLANE COORDINATES ARE CONVERTED FROM LAT/LONG USING NGS PROGRAM SPCS83(V2.1). RESULTANT COORDINATES AT PRIMARY HARBOR CONTROL HOLD USACE SBC "1475–1 1986" AS N 2,482,263.76, E 1,687,527.24 AND 2.5" AL CAP "BH–F 2001" AS N 2,481,074.18, E 1,686,930.35.
2. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST: "9466477, BETHEL, KUSKOKWIM RIVER, ALASKA", PUBLISHED 01/14/2011. THIS TIDAL DATUM IS BASED ON THE 1983–2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOS TIDAL BENCHMARK "946 6477 B" AS 10.58' AND NOS TIDAL BENCHMARK "946 6477 C" AS 10.01'. ALSO PROVIDED ARE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) EQUIVALENTS, BASED ON HOLDING PUBLISHED VERTICAL VALUES FOR NOS BENCHMARK STAINLESS STEEL ROD, "6477 B 2010" (PID BBCC65), AS 17.94'.
3. THE SURVEY WAS CONDUCTED ON OCTOBER 15–19, 2010. HYDROGRAPHIC SOUNDING DATA WAS COLLECTED USING AN ODOM ES3 MULTI–BEAM ECHOSOUNDER (200KHZ, 120–DEGREE SWATH–WIDTH WITH 120, 0.75 DEGREE BEAMS). POSITIONING AND VESSEL ATTITUDE WERE PROVIDED IN REAL TIME USING A TRIMBLE 461 RTK GPS RECEIVER OPERATING ON KINEMATIC CORRECTORS BROADCAST FROM A TRIMBLE 5700 RTK BASE RECEIVER SET AT CONTROL STATION, "1475–1 1986". SOUND VELOCITY PROFILE WAS PROVIDED USING AN ODOM DIGI–BAR PRO, AND WAS PROVIDED IN REAL TIME AT THE SOUNDER HEAD USING AN ODOM DIGI–BAR V. DATA COLLECTION AND NAVIGATION WERE PERFORMED USING HYPACK HYSWEEP (2010) SOFTWARE. MULTI–BEAM SURVEY DATA WAS POST–PROCESSED USING HYPACK HYSWEEP (2010) SOFTWARE.
4. SOUNDING VALUES SHOWN ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
5. THIS DRAWING IS INDICATIVE OF GENERAL SEAFLOOR CONDITIONS ON THE DATES OF SURVEY.
6. THIS SURVEY WAS CONDUCTED BY HUGHES AND ASSOCIATES, WASILLA, AK.

CONTROL COORDINATES

STATION	NORTHING	EASTING	MLLW	NAVD88	DESCRIPTION
1475–1 1986	N 2,482,263.76	E 1,687,527.24	8.40'	15.76'	USACE SBC
ATS 1346 1992	----	----	----	----	2" ALUM. CAP
LCMF C1 1992*	N 2,481,417	E 1,687,819	----	----	3" ALUM. CAP
LCMF C2 1992*	N 2,482,146	E 1,686,982	----	----	3" ALUM. CAP
BH–A 1996*	N 2,481,940	E 1,687,756	----	----	2.5" ALUM. CAP
BH–B 1996*	N 2,481,469	E 1,687,431	----	----	2.5" ALUM. CAP
BH–C 1998	N 2,481,686.86	E 1,687,139.66	6.55'	13.91'	3" ALUM. CAP
BH–D 1998	N 2,481,244.34	E 1,687,288.37	8.49'	15.85'	3" ALUM. CAP
BH–E 2001	----	----	----	----	DESTROYED
BH–F 2001	N 2,481,074.18	E 1,686,930.35	8.24'	15.60'	2.5" ALUMINUM CAP

*NOTE: COORDINATES AND ELEVATIONS FOR THESE MONUMENTS HAVE NOT BEEN UPDATED BECAUSE THEY WERE INACCESSIBLE AT THE TIME OF THE SURVEY.

PROJECT LIMITS

CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	1688093.6	2481713.9	14	1687886.4	2481587.0
2	1688107.4	2481663.8	15	1687602.9	2481616.3
3	1908882.6	2481175.9	16	1687574.0	2481608.3
4	1687727.9	2481078.7	17	1687400.4	2481560.9
5	1687318.9	2481023.3	18	1686980.2	2481984.5
6	1687205.9	2480939.7	19	1686989.1	2482017.9
7	1687098.7	2480706.3	20	1687428.5	2482138.8
8	1687070.5	2480719.2	21	1687544.2	2482170.6
9	1687178.0	2480953.3	22	1687593.4	2482142.6
10	1687314.0	2481053.9	23	1687705.9	2481732.3
11	1687723.8	2481109.4	24	1687749.0	2481695.7
12	1687834.4	2481189.4	25	1687951.6	2481674.8
13	1687961.6	2481451.2			

VOLUME COMPUTATIONS

VOLUME AVAILABLE TO PROJECT DEPTH (–4 FT)	1,471 cy
VOLUME AVAILABLE BETWEEN PROJECT DEPTH (–4 FT) AND MAX–PAY DEPTH (–6 FT)	11,031 cy
VOLUME AVAILABLE ALONG SIDE SLOPES	420 cy
TOTAL VOLUME AVAILABLE	12,922 cy

STATE OF ALASKA 49TH
JACK S. HUGHES
LS-4915
REGISTERED PROFESSIONAL LAND SURVEYOR

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB–10–D–0005
CONTRACTOR HUGHES AND ASSOCIATES
CITY WASILLA STATE AK
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Appvd

Date: 01/31/11
Dwg Scale: 1" = 50'
Plot Scale:
Section: File:
Branch: Drawing #:
Designed:
Drawn: REH
Reviewed: CSH
Chief:
Submitted:
Chief:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

2859–11

BETHEL, ALASKA
BETHEL HARBOR
CONDITION SURVEY
OCTOBER 15–19, 2010

Reference number:

Sheet 2 of 4