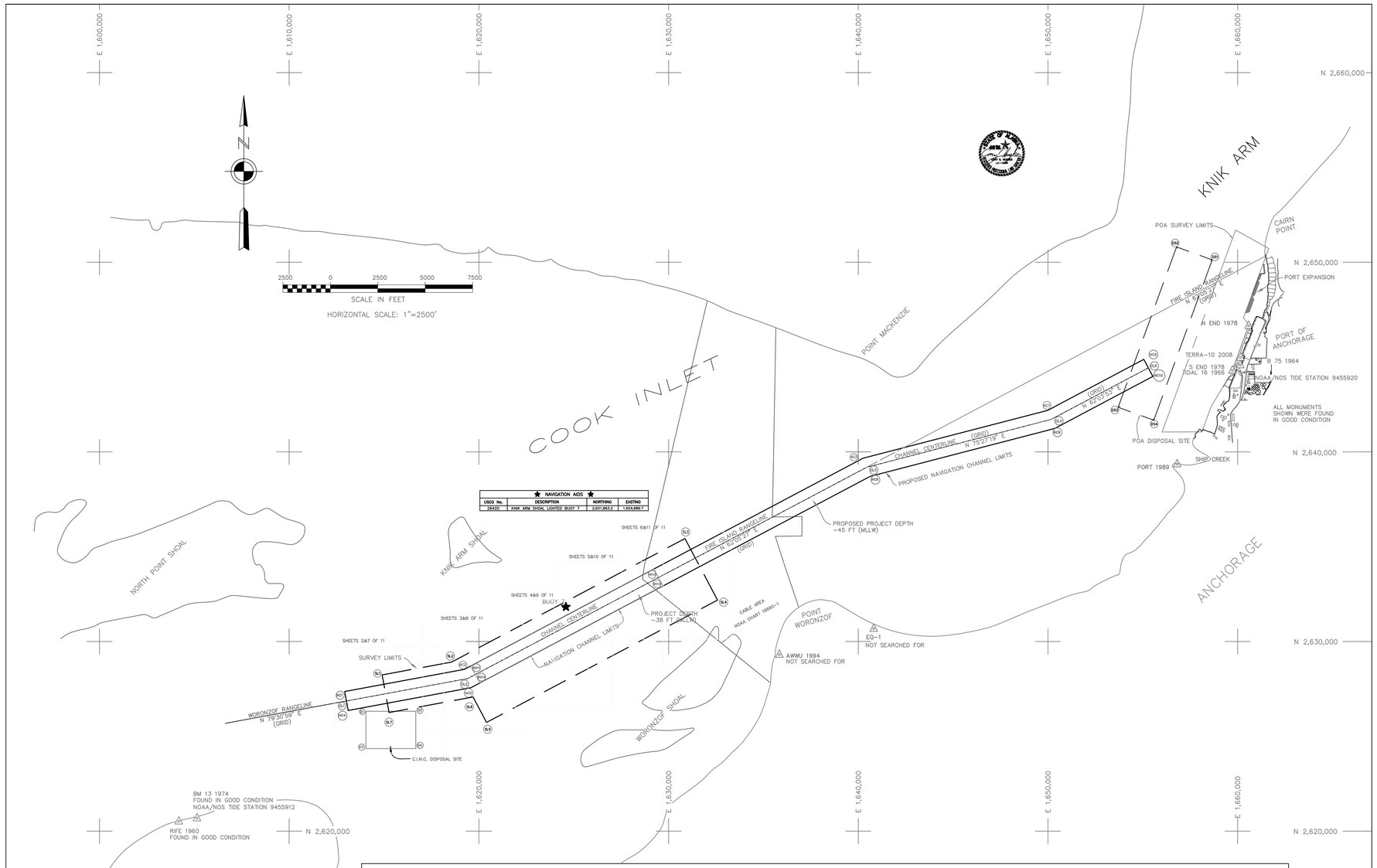
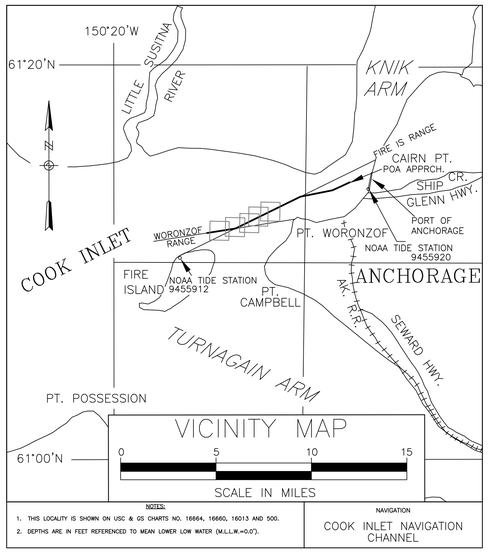


★ NAVIGATION AIDS ★			
USCG No.	DESCRIPTION	NORTHING	EASTING
26420	KNIK ARM SHOAL LIGHTED BUOY 2	2,631,953.2	1,624,689.7



NOTES:
1. THIS LOCALITY IS SHOWN ON USC & GS CHARTS NO. 16664, 16660, 16013 AND 500.
2. DEPTHS ARE IN FEET REFERENCED TO MEAN LOWER LOW WATER (M.L.L.W.=0.0').

NAVIGATION
COOK INLET NAVIGATION CHANNEL

NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 IN U.S. SURVEY FEET HOLDING USACE SBC "N END 1978" AS N 2,646,652.19, E 1,660,582.43 AND USACE SBC "S END 1978" AS N 2,644,295.65, E 1,659,728.19.
2. VERTICAL CONTROL IS MEAN-LOWER-LOW-WATER (MLLW = 0.0') IN U.S. SURVEY FEET BASED ON NOAA/NOS TIDAL DATUM "9455920 ANCHORAGE, KNIK ARM, COOK INLET, ALASKA", PUBLISHED 04/21/2003, HOLDING USCGS SBC "B 75 1964" AS 36.82' AND NOAA/NOS TIDAL DATUM "9455912 FIRE ISLAND, ALASKA", PUBLISHED 05/21/2004, HOLDING NOS SBC "RIFE 1960" AS 29.99'.
3. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
4. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF SURVEY.
5. SURVEY WAS CONDUCTED ON MAY 28 – JUNE 1, 2012 BY HUGHES AND ASSOCIATES, WASILLA, AK. SOUNDINGS WERE COLLECTED USING AN ODOM ES3 MULTI-BEAM DEPTH SOUNDER (200KHZ, 120-DEGREE SWATH-WIDTH WITH 240, 0.75 DEGREE BEAMS). 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. POSITIONING AND TIDES 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, "B 75 1964". VESSEL NAVIGATION, DATA COLLECTION AND PROCESSING WERE PERFORMED USING HYPACK 2012 INTEGRATED SOFTWARE.
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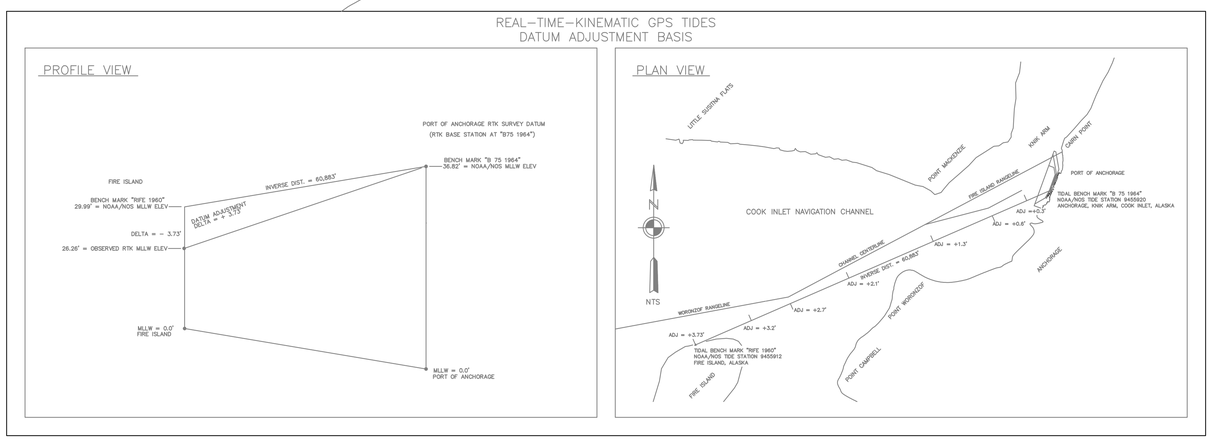

COOK INLET NAVIGATION CHANNEL COORDINATES							
COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC11	2,628,708.65	1,619,570.25		NC13	2,632,927.80	1,629,708.02	
NC12	2,633,826.75	1,629,232.30		NC14	2,627,809.70	1,620,045.97	

PROPOSED CHANNEL CENTERLINE				
COR.	NORTHING	EASTING	STATION	DESCRIPTION
CL1	2,626,865.50	1,613,018.09	0+00	CENTERLINE WORONZOF RANGELINE
CL2	2,628,048.21	1,619,409.58	65+00	WORONZOF/FIRE ISLAND RANGELINE INTERSECTION
CL3	2,639,188.27	1,640,441.44	303+00	FIRE ISLAND/TRANSITION TO POA APPROACH
CL4	2,641,712.17	1,650,169.36	403+50	POA APPROACH
CL5	2,644,429.31	1,655,293.53	459+50	CENTERLINE POA APPROACH

PROPOSED CHANNEL LIMITS							
COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC1	2,627,365.51	1,612,925.56	0+00	NC6	2,638,711.03	1,640,626.80	303+00
NC2	2,628,534.04	1,619,240.43	65+00	NC7	2,642,189.38	1,649,983.88	403+50
NC3	2,639,665.52	1,640,256.07	303+00	NC8	2,644,878.56	1,655,055.31	459+50
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NC5	2,627,562.38	1,619,578.73	65+00	NC10	2,643,980.06	1,655,531.75	459+50

2012 SURVEY LIMITS							
COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
SL1	2,628,239.22	1,614,899.26		SL6	2,627,075.24	1,619,694.12	
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SL3	2,635,431.08	1,630,862.88					
SL4	2,632,186.33	1,632,582.03					
SL5	2,625,736.21	1,620,403.58					

CONTROL COORDINATES					
STATION	NORTHING	EASTING	ELEVATION NAVD88	ELEVATION MLLW	DESCRIPTION
N END 1978	2,646,652.19	1,660,582.43		41.39	USACE SBC
S END 1978	2,644,295.69	1,659,728.19		40.37	USACE SBC
TERRA-10 2008	2,644,971.59	1,660,156.45		80.40	PORT OFFICE ANT. MOUNT
PORT 1989	2,639,936.64	1,656,922.51		39.93	USACE SAC
EQ-1	2,629,995.41	1,643,787.75		--	--
VAN DUSEN GPS 1986	2,621,198.82	1,648,753.69		--	NGS SBC
AWWU 1994	2,629,310.76	1,635,837.68		--	3" ALCAP
NOAA/NOS TIDAL BENCH MARKS AT THE PORT OF ANCHORAGE 9455920					
TIDAL 16 1966	2,644,293	1,659,727	29.96	40.53	USCGS BENCH MARK SBC
B 75 1964	2,644,598	1,660,095	26.36	36.82	USCGS BENCH MARK SBC
NOAA/NOS TIDAL BENCH MARKS AT FIRE ISLAND 9455912					
BM 13 1974	2,620,685	1,605,138		28.41	NOS TIDAL BENCH MARK SBC
RIFE 1960	2,620,520	1,604,180		29.99	USCGS TRI-STA SBC

VOLUME COMPUTATIONS		
PROJECT DEPTH -38' MLLW		CUBIC YARDS
VOLUME AVAILABLE ABOVE PROJECT DEPTH	(-38' MLLW)	1,951,119
VOLUME AVAILABLE BETWEEN PD AND MAXIMUM PAYLINE	(-42.5' MLLW)	1,742,758
VOLUME AVAILABLE ALONG SIDESLOPES	4:1 (H:V)	48465
TOTAL		3,742,342

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB-10-0005
CONTRACTOR HUGHES & ASSOCIATES, INC
CITY WASILLA STATE AK
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Approd

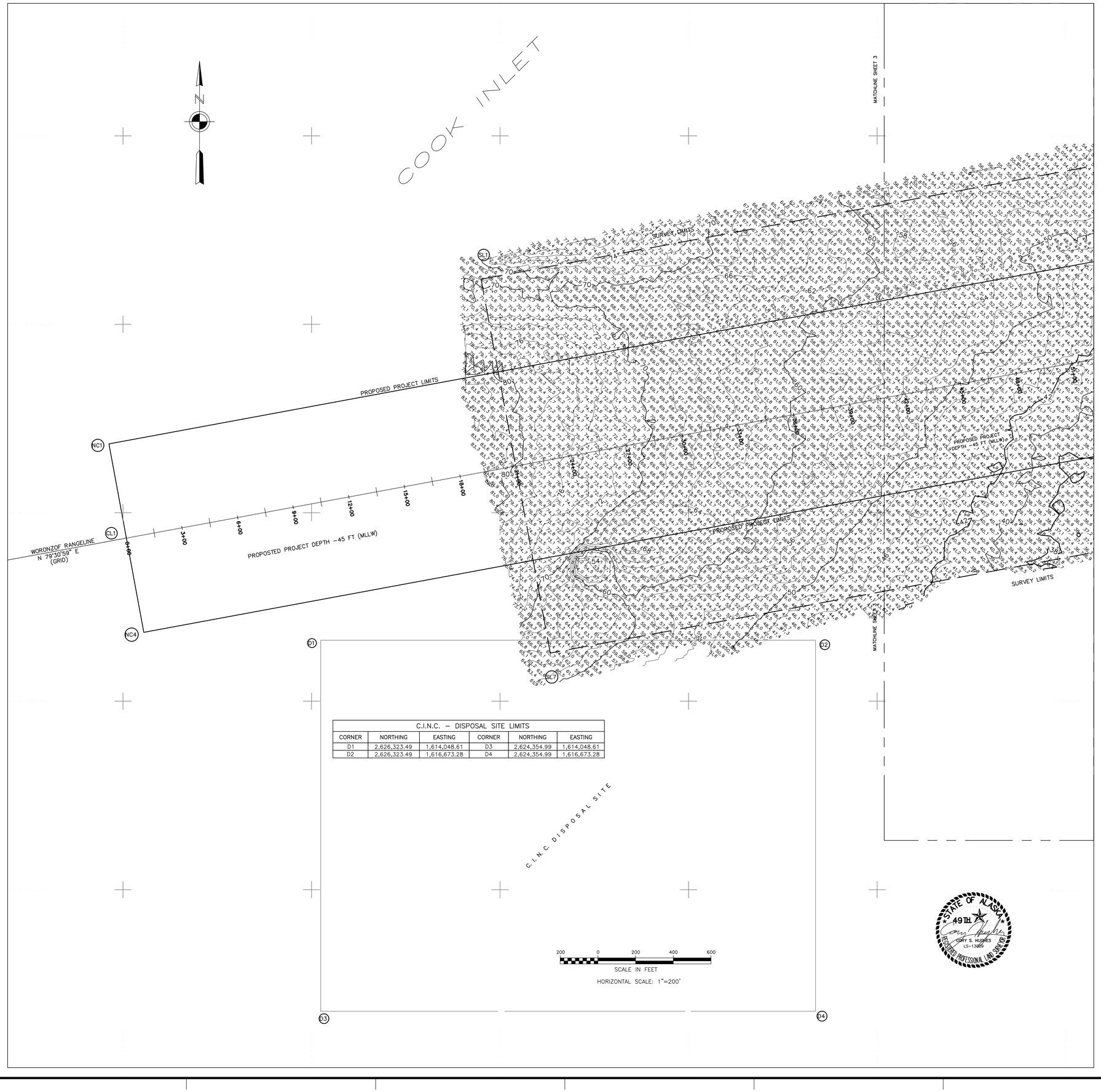
Designed:
Drawn: REH/BTH
Reviewed: CSH
Chief
Submitted:
Chief
Date: 07/01/12
Dwg Scale: 1" = 2500'
Plot Scale: 1:1
File: 2012 CINC Condition Survey.dwg
Section
Branch

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

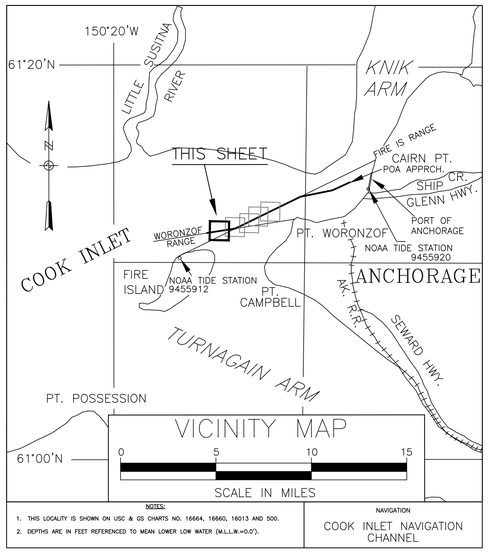
3006-12

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V-101
Sheet 1 of 11



C.I.N.C. – DISPOSAL SITE LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
D1	2,626,323.49	1,614,048.61	D3	2,624,354.99	1,614,048.61
D2	2,626,323.49	1,616,673.28	D4	2,624,354.99	1,616,673.28



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COR.	NORTHING	EASTING	STATION	DESCRIPTION
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TOTAL		3,742,342

STATE OF ALASKA
49TH
GARY S. HUGHES
LS-13989
REGISTERED PROFESSIONAL LAND SURVEYOR

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB–10–0005
CONTRACTOR HUGHES & ASSOCIATES, INC
CITY WASILLA STATE AK
Recommended: Approved: Date:
PRIME CONTRACTOR REVIEWING ENGINEER

Sym	Action	Description	Date	Approv

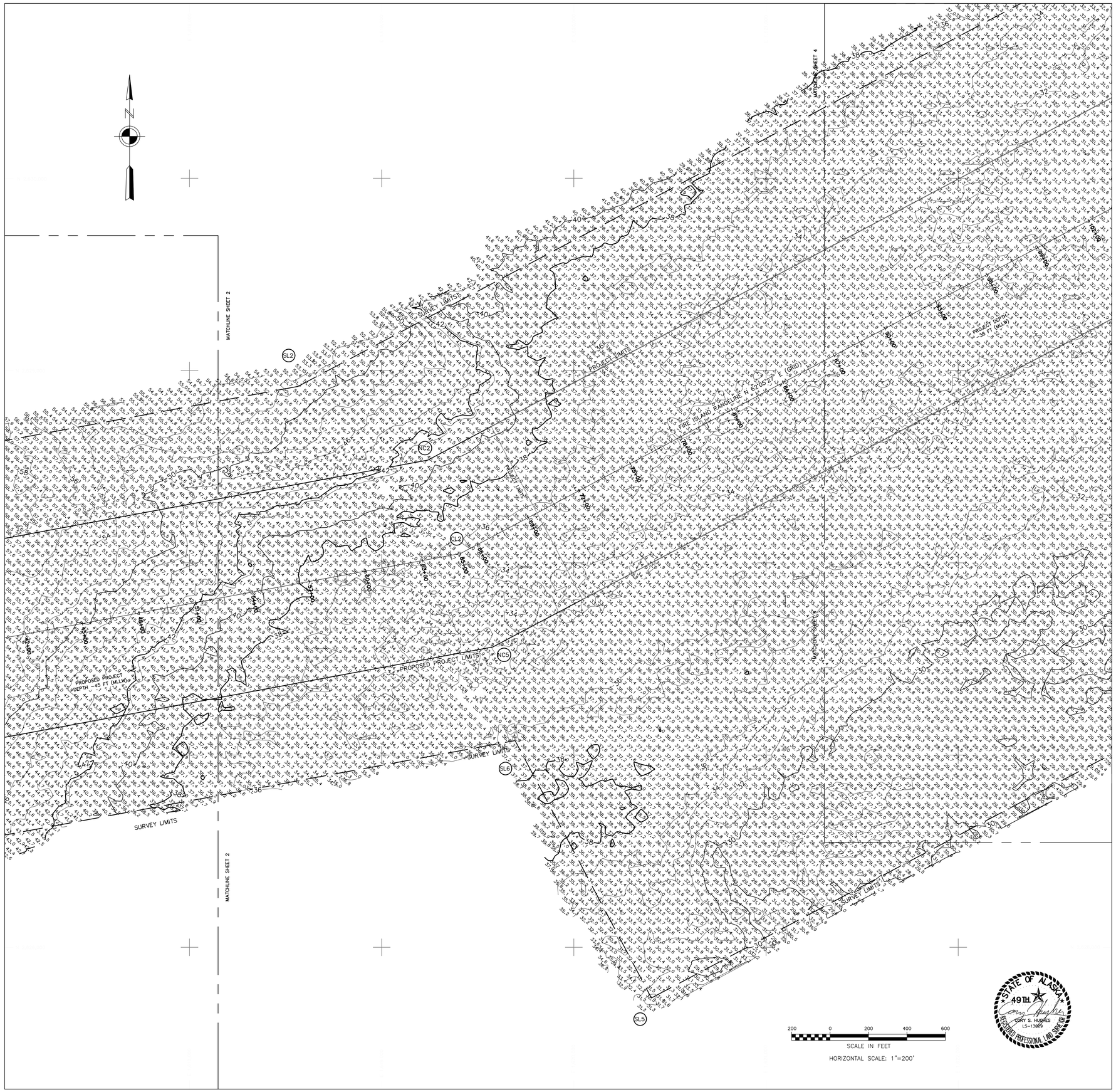
Date: 07/01/12
Dwg Scale: 1" = 200'
Plot Scale: 1:1
File: 2012 CINC Condition Survey.dwg
Designed:
Drawn: REH/BTH
Reviewed: CSH
Chief:
Submitted:
Chief:
Section:
Branch:

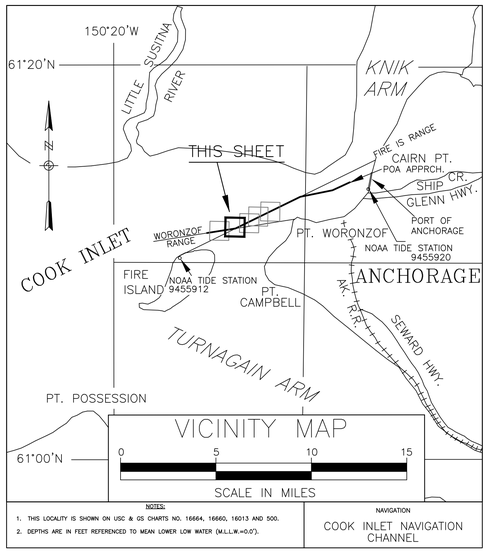
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

3006–12

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V–102
Sheet 2 of 11





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STATE OF ALASKA 49TH CORY S. HUGHES LS-13089 REGISTERED PROFESSIONAL LAND SURVEYOR

BATHYMETRY

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Sym	Action	Description	Date	Appvd

Date: 07/01/12
Dwg Scale: 1" = 200'
Plot Scale: 1:1
File: 2012 CINC Condition Survey.dwg
Designed:
Drawn: REH/BTH
Reviewed: CSH
Chief
Submitted:
Chief
Branch:
Section:

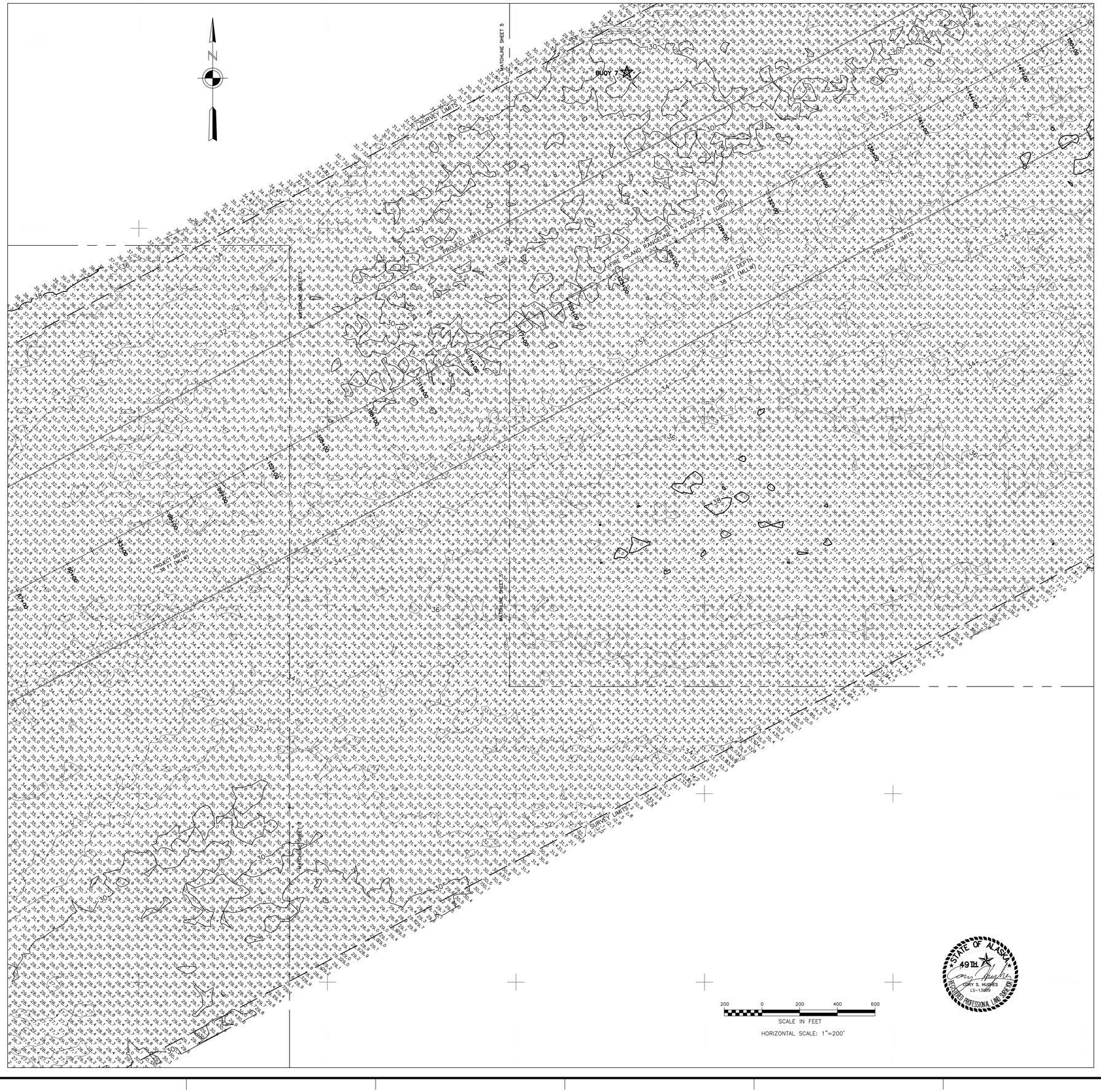
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

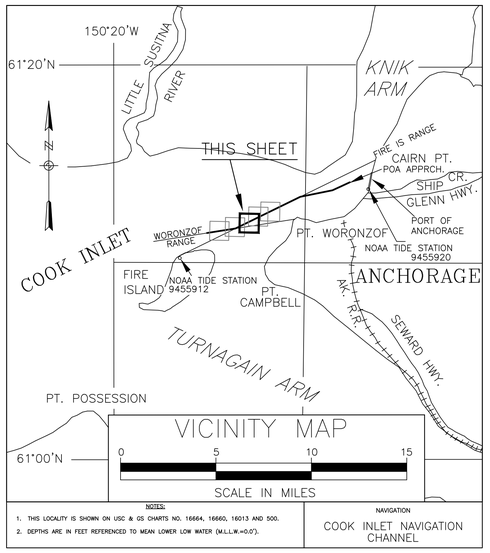
3006-12

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V-103
Sheet 3 of 11

CORPS OF ENGINEERS





NOTES:

1. THIS LOCALITY IS SHOWN ON USC & GS CHARTS NO. 16664, 16660, 16013 AND 500.
2. DEPTHS ARE IN FEET REFERENCED TO MEAN LOWER LOW WATER (M.L.L.W.=0.0').

NAVIGATION

COOK INLET NAVIGATION CHANNEL

NOTES

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2. VERTICAL CONTROL IS MEAN-LOWER-LOW-WATER (MLLW = 0.0') IN U.S. SURVEY FEET BASED ON NOAA/NOS TIDAL DATUM "9455920 ANCHORAGE, KNIK ARM, COOK INLET, ALASKA", PUBLISHED 04/21/2003, HOLDING USCGS SBC "B 75 1964" AS 36.82' AND NOAA/NOS TIDAL DATUM "9455912 FIRE ISLAND, ALASKA", PUBLISHED 05/21/2004, HOLDING NOS SBC "RIFE 1960" AS 29.99'.
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COOK INLET NAVIGATION CHANNEL COORDINATES

COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC11	2,628,708.65	1,619,570.25		NC13	2,632,927.80	1,629,708.02	
NC12	2,633,826.75	1,629,232.30		NC14	2,627,809.70	1,620,045.97	

PROPOSED CHANNEL CENTERLINE

COR.	NORTHING	EASTING	STATION	DESCRIPTION
CL1	2,626,865.50	1,613,018.09	0+00	CENTERLINE WORONZOF RANGELINE
CL2	2,628,048.21	1,619,409.58	65+00	WORONZOF/FIRE ISLAND RANGELINE INTERSECTION
CL3	2,639,188.27	1,640,441.44	303+00	FIRE ISLAND/TRANSITION TO POA APPROACH
CL4	2,641,712.17	1,650,169.36	403+50	POA APPROACH
CL5	2,644,429.31	1,655,293.53	459+50	CENTERLINE POA APPROACH

PROPOSED CHANNEL LIMITS

COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC1	2,627,365.51	1,612,925.56	0+00	NC6	2,638,711.03	1,640,626.80	303+00
NC2	2,628,534.04	1,619,240.43	65+00	NC7	2,642,189.38	1,649,983.88	403+50
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NC5	2,627,562.38	1,619,578.73	65+00	NC10	2,643,980.06	1,655,531.75	459+50

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CONTROL COORDINATES

STATION	NORTHING	EASTING	ELEVATION NAVD88	ELEVATION MLLW	DESCRIPTION
N END 1978	2,646,652.19	1,660,582.43		41.39	USACE SBC
S END 1978	2,644,295.69	1,659,728.19		40.37	USACE SBC
TERRA-10 2008	2,644,971.59	1,660,156.45		80.40	PORT OFFICE ANT. MOUNT
PORT 1989	2,639,936.64	1,656,922.51		39.93	USACE SAC
EQ-1	2,629,995.41	1,643,787.75		–	–
VAN DUSEN GPS 1986	2,621,198.82	1,648,753.69		–	NGS SBC
AWWU 1994	2,629,310.76	1,635,837.68		–	3" ALCAP
NOAA/NOS TIDAL BENCH MARKS AT THE PORT OF ANCHORAGE 9455920					
TIDAL 16 1966	2,644,293	1,659,727	29.96	40.53	USCGS BENCH MARK SBC
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BM 13 1974	2,620,685	1,605,138		28.41	NOS TIDAL BENCH MARK SBC
RIFE 1960	2,620,520	1,604,180		29.99	USCGS TRI-STA SBC

VOLUME COMPUTATIONS

PROJECT DEPTH -38' MLLW		CUBIC YARDS
VOLUME AVAILABLE ABOVE PROJECT DEPTH	(-38' MLLW)	1,951,119
VOLUME AVAILABLE BETWEEN PD AND MAXIMUM PAYLINE	(-42.5' MLLW)	1,742,758
VOLUME AVAILABLE ALONG SIDESLOPES	4:1 (H:V)	48465
TOTAL		3,742,342

STATE OF ALASKA 49TH CORY S. HUGHES LS-13869 PROFESSIONAL LAND SURVEYOR

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

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CONTRACTOR HUGHES & ASSOCIATES, INC
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Recommended: Approved: Date:
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ANCHORAGE, ALASKA

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
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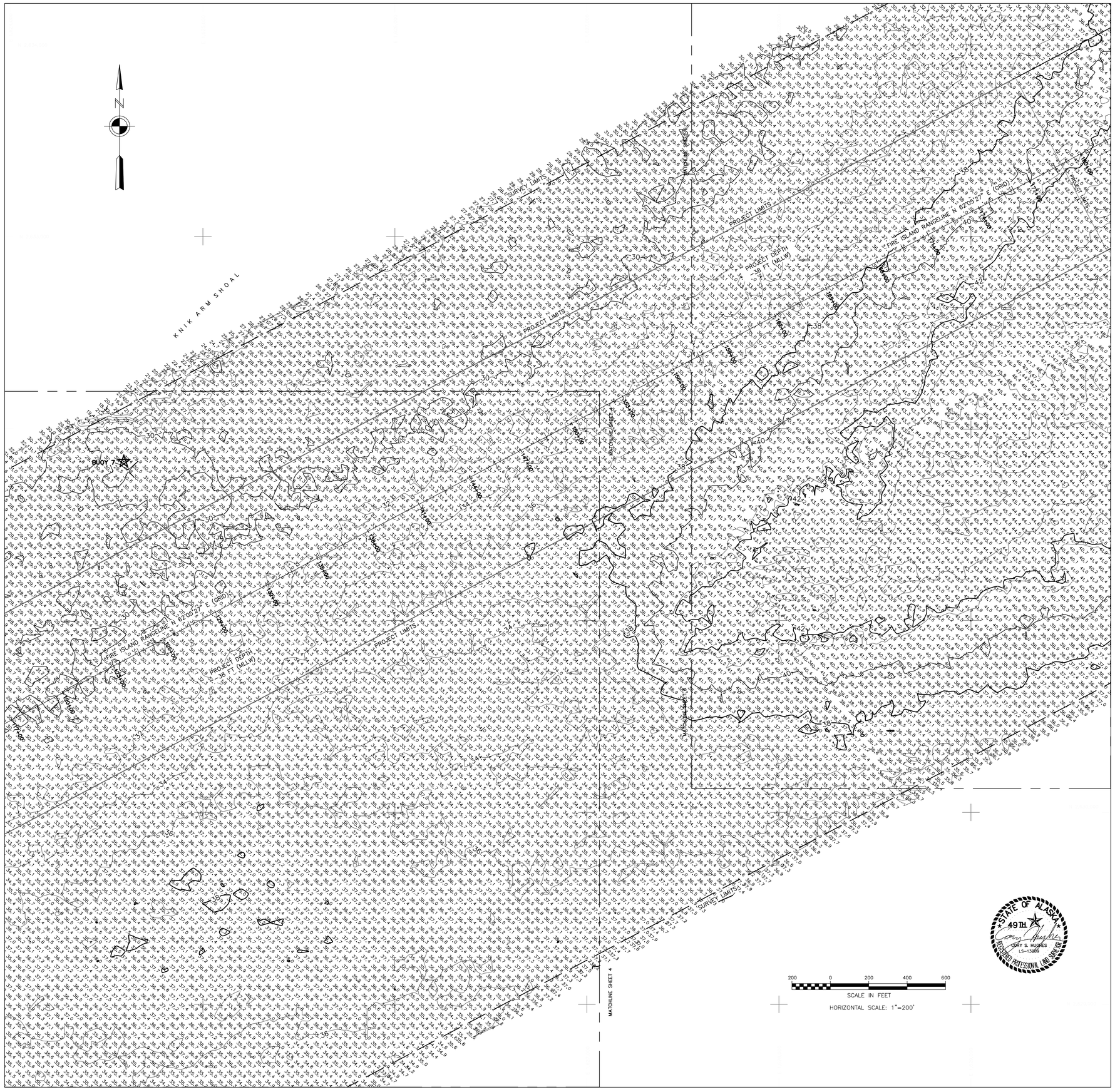
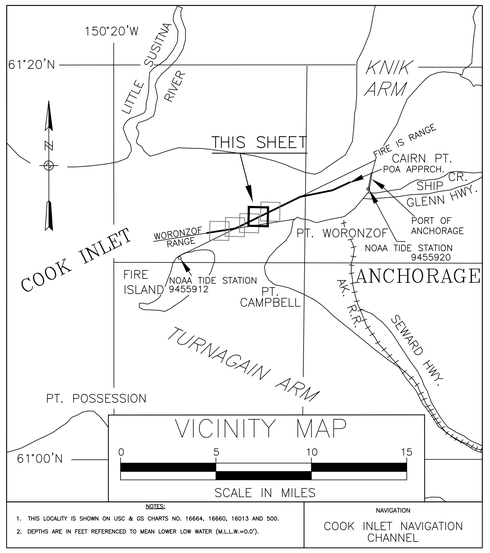
MAY 28 – JUNE 1, 2012

Reference number:
V-104
Sheet 4 of 11

CORPS OF ENGINEERS





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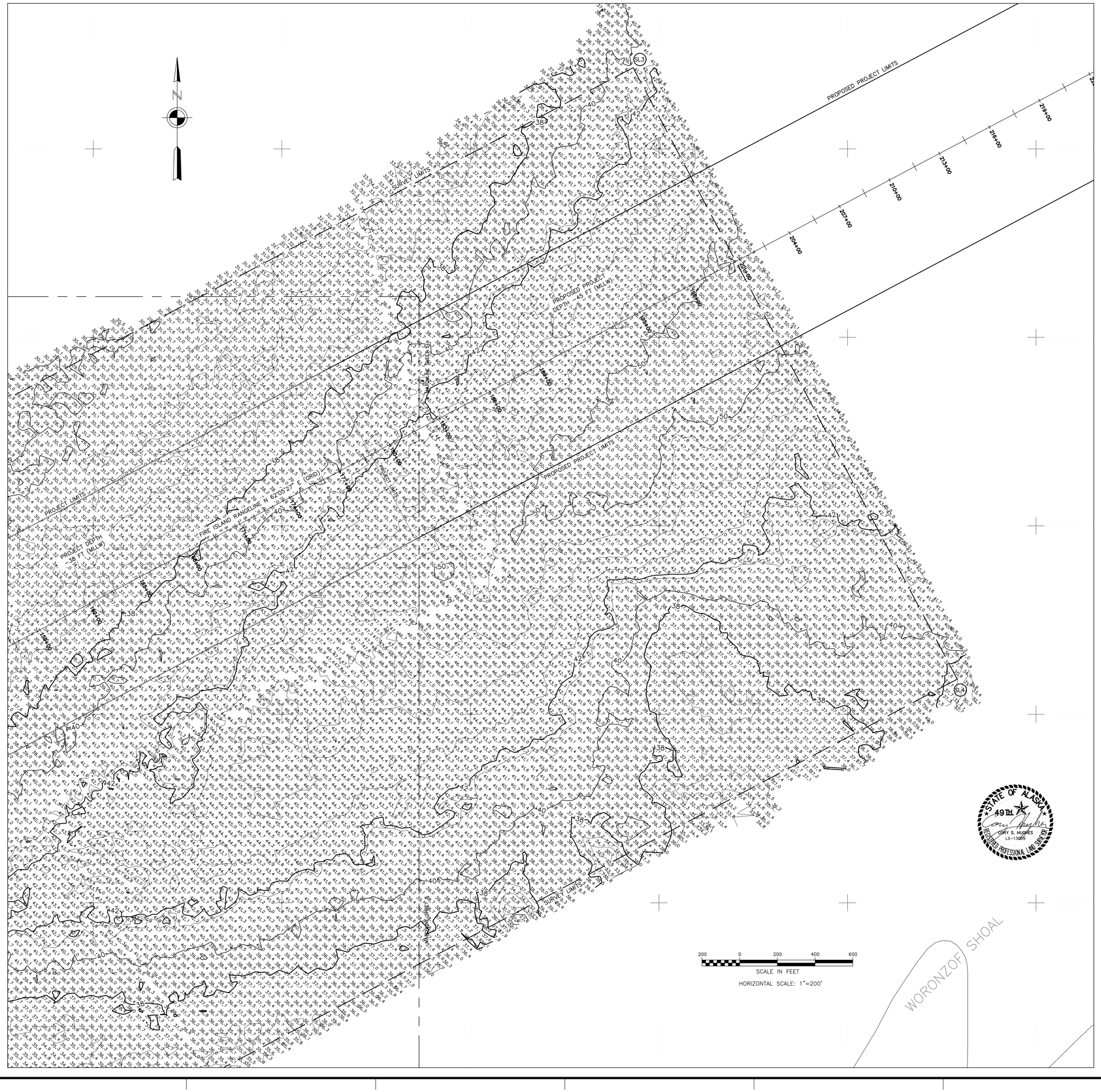
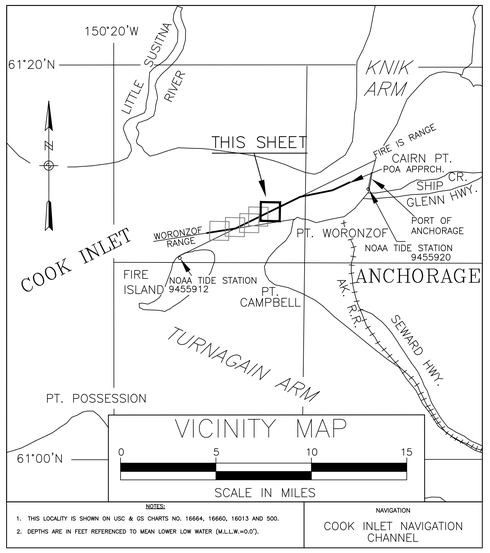
Sheet 5 of 11





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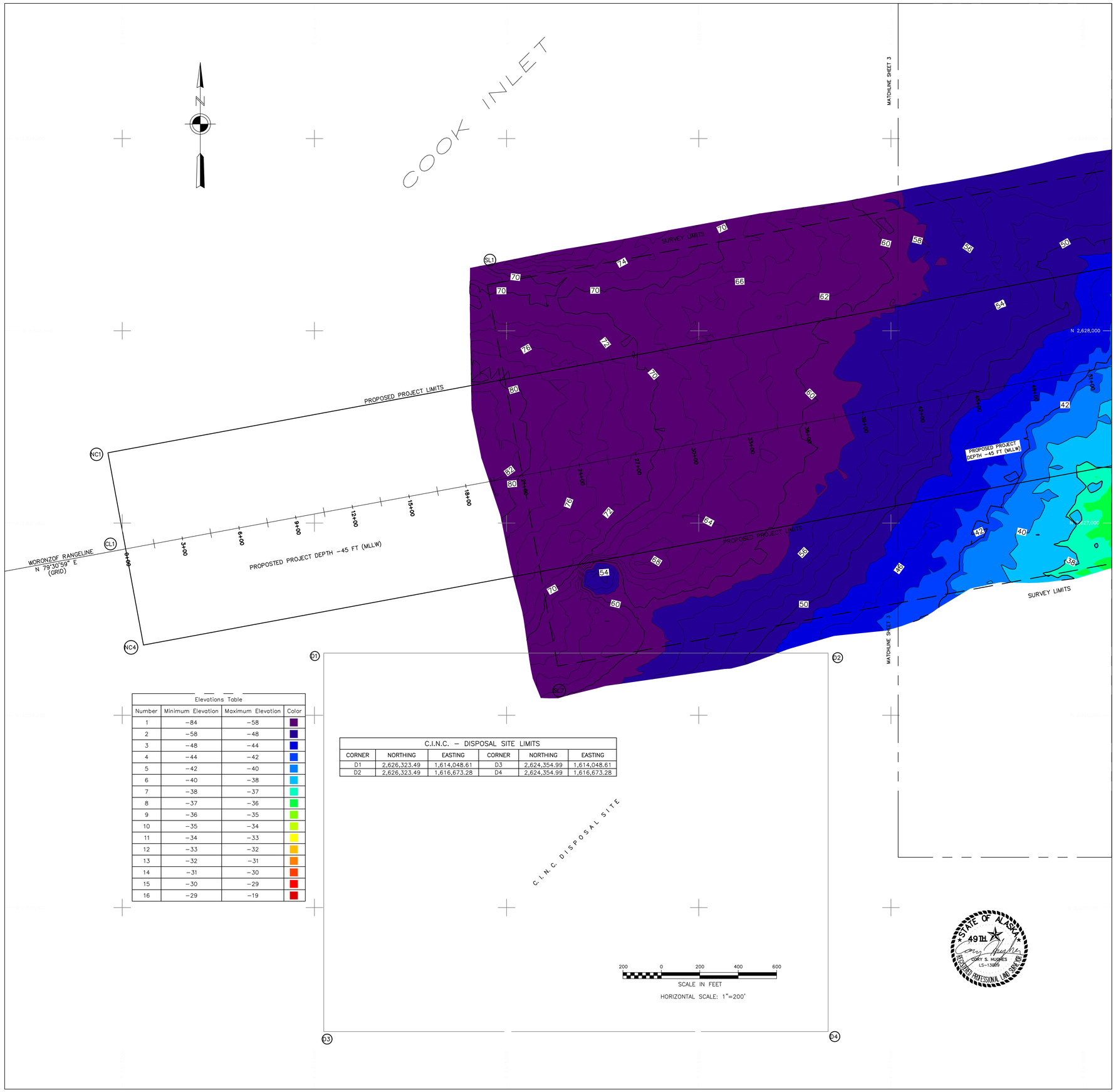
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

3006–12

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V–106
Sheet 6 of 11



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Number	Minimum Elevation	Maximum Elevation	Color
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2	-58	-48	
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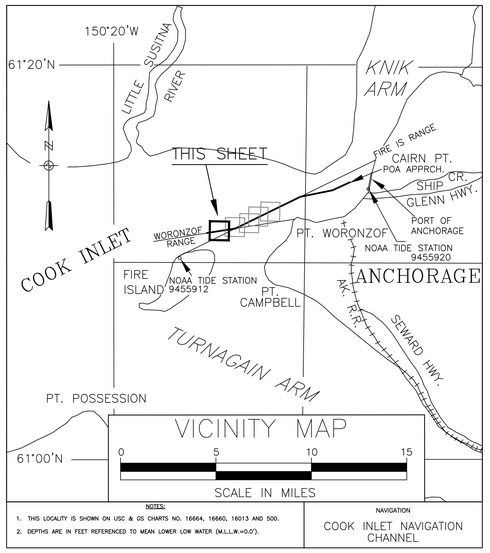
9	-36	-35	
10	-35	-34	
11	-34	-33	
12	-33	-32	
13	-32	-31	
14	-31	-30	
15	-30	-29	
16	-29	-19	

C.I.N.C. – DISPOSAL SITE LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
D1	2,626,323.49	1,614,048.61	D3	2,624,354.99	1,614,048.61
D2	2,626,323.49	1,616,673.28	D4	2,624,354.99	1,616,673.28



NOTES:
1. THIS LOCALITY IS SHOWN ON USC & GS CHARTS NO. 16664, 16660, 16013 AND 500.
2. DEPTHS ARE IN FEET REFERENCED TO MEAN LOWER LOW WATER (M.L.L.W.=0.0').

NAVIGATION
COOK INLET NAVIGATION CHANNEL

NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 IN U.S. SURVEY FEET HOLDING USACE SBC "N END 1978" AS N 2,646,652.19, E 1,660,582.43 AND USACE SBC "S END 1978" AS N 2,644,295.65, E 1,659,728.19.
2. VERTICAL CONTROL IS MEAN-LOWER-LOW-WATER (MLLW = 0.0') IN U.S. SURVEY FEET BASED ON NOAA/NOS TIDAL DATUM "9455920 ANCHORAGE, KNIK ARM, COOK INLET, ALASKA", PUBLISHED 04/21/2003, HOLDING USCGS SBC "B 75 1964" AS 36.82' AND NOAA/NOS TIDAL DATUM "9455912 FIRE ISLAND, ALASKA", PUBLISHED 05/21/2004, HOLDING NOS SBC "RIFE 1960" AS 29.99'.
3. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
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5. SURVEY WAS CONDUCTED ON MAY 28 – JUNE 1, 2012 BY HUGHES AND ASSOCIATES, WASILLA, AK. SOUNDINGS WERE COLLECTED USING AN ODOM ES3 MULTI-BEAM DEPTH SOUNDER (200KHZ, 120-DEGREE SWATH-WIDTH WITH 240, 0.75 DEGREE BEAMS). 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. POSITIONING AND TIDES 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, "B 75 1964". VESSEL NAVIGATION, DATA COLLECTION AND PROCESSING WERE PERFORMED USING HYPACK 2012 INTEGRATED SOFTWARE.
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COOK INLET NAVIGATION CHANNEL COORDINATES							
COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC11	2,628,708.65	1,619,570.25		NC13	2,632,927.80	1,629,708.02	
NC12	2,633,826.75	1,629,232.30		NC14	2,627,809.70	1,620,045.97	

PROPOSED CHANNEL CENTERLINE				
COR.	NORTHING	EASTING	STATION	DESCRIPTION
CL1	2,626,865.50	1,613,018.09	0+00	CENTERLINE WORONZOF RANGELINE
CL2	2,628,048.21	1,619,409.58	65+00	WORONZOF/FIRE ISLAND RANGELINE INTERSECTION
CL3	2,639,188.27	1,640,441.44	303+00	FIRE ISLAND/TRANSITION TO POA APPROACH
CL4	2,641,712.17	1,650,169.36	403+50	POA APPROACH
CL5	2,644,429.31	1,655,293.53	459+50	CENTERLINE POA APPROACH

PROPOSED CHANNEL LIMITS							
COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC1	2,627,365.51	1,612,925.56	0+00	NC6	2,638,711.03	1,640,626.80	303+00
NC2	2,628,534.04	1,619,240.43	65+00	NC7	2,642,189.38	1,649,983.88	403+50
NC3	2,639,665.52	1,640,256.07	303+00	NC8	2,644,878.56	1,655,055.31	459+50
NC4	2,626,365.49	1,613,110.61	0+00	NC9	2,641,234.95	1,650,354.84	403+50
NC5	2,627,562.38	1,619,578.73	65+00	NC10	2,643,980.06	1,655,531.75	459+50

2012 SURVEY LIMITS							
COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
SL1	2,628,239.22	1,614,899.26		SL6	2,627,075.24	1,619,694.12	
SL2	2,628,917.45	1,618,564.51		SL7	2,628,239.22	1,615,266.26	
SL3	2,635,431.08	1,630,862.88					
SL4	2,632,186.33	1,632,582.03					
SL5	2,625,736.21	1,620,403.58					

CONTROL COORDINATES					
STATION	NORTHING	EASTING	ELEVATION NAVD88	ELEVATION MLLW	DESCRIPTION
N END 1978	2,646,652.19	1,660,582.43		41.39	USACE SBC
S END 1978	2,644,295.69	1,659,728.19		40.37	USACE SBC
TERRA-10 2008	2,644,971.59	1,660,156.45		80.40	PORT OFFICE ANT. MOUNT
PORT 1989	2,639,936.64	1,656,922.51		39.93	USACE SAC
EQ-1	2,629,995.41	1,643,787.75		–	–
VAN DUSEN GPS 1986	2,621,198.82	1,648,753.69		–	NGS SBC
AWWU 1994	2,629,310.76	1,635,837.68		–	3" ALCAP
NOAA/NOS TIDAL BENCH MARKS AT THE PORT OF ANCHORAGE 9455920					
TIDAL 16 1966	2,644,293	1,659,727	29.96	40.53	USCGS BENCH MARK SBC
B 75 1964	2,644,598	1,660,095	26.36	36.82	USCGS BENCH MARK SBC
NOAA/NOS TIDAL BENCH MARKS AT FIRE ISLAND 9455912					
BM 13 1974	2,620,685	1,605,138		28.41	NOS TIDAL BENCH MARK SBC
RIFE 1960	2,620,520	1,604,180		29.99	USCGS TRI-STA SBC

VOLUME COMPUTATIONS		
PROJECT DEPTH -38' MLLW		CUBIC YARDS
VOLUME AVAILABLE ABOVE PROJECT DEPTH	(-38' MLLW)	1,951,119
VOLUME AVAILABLE BETWEEN PD AND MAXIMUM PAYLINE	(-42.5' MLLW)	1,742,758
VOLUME AVAILABLE ALONG SIDESLOPES	4:1 (H:V)	48465
TOTAL		3,742,342

STATE OF ALASKA 49TH
CORY S. HUGHES
LS-13269
REGISTERED PROFESSIONAL LAND SURVEYOR

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB-10-0005
CONTRACTOR HUGHES & ASSOCIATES, INC
CITY WASILLA STATE AK
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Approd

Date: 07/01/12
Dwg Scale: 1" = 200'
Plot Scale: 1:1
File: 2012 CINC Condition Survey.dwg
Designed:
Drawn: REH/BTH
Reviewed: CSH
Chief
Submitted:
Chief
Branch:
SecLoc

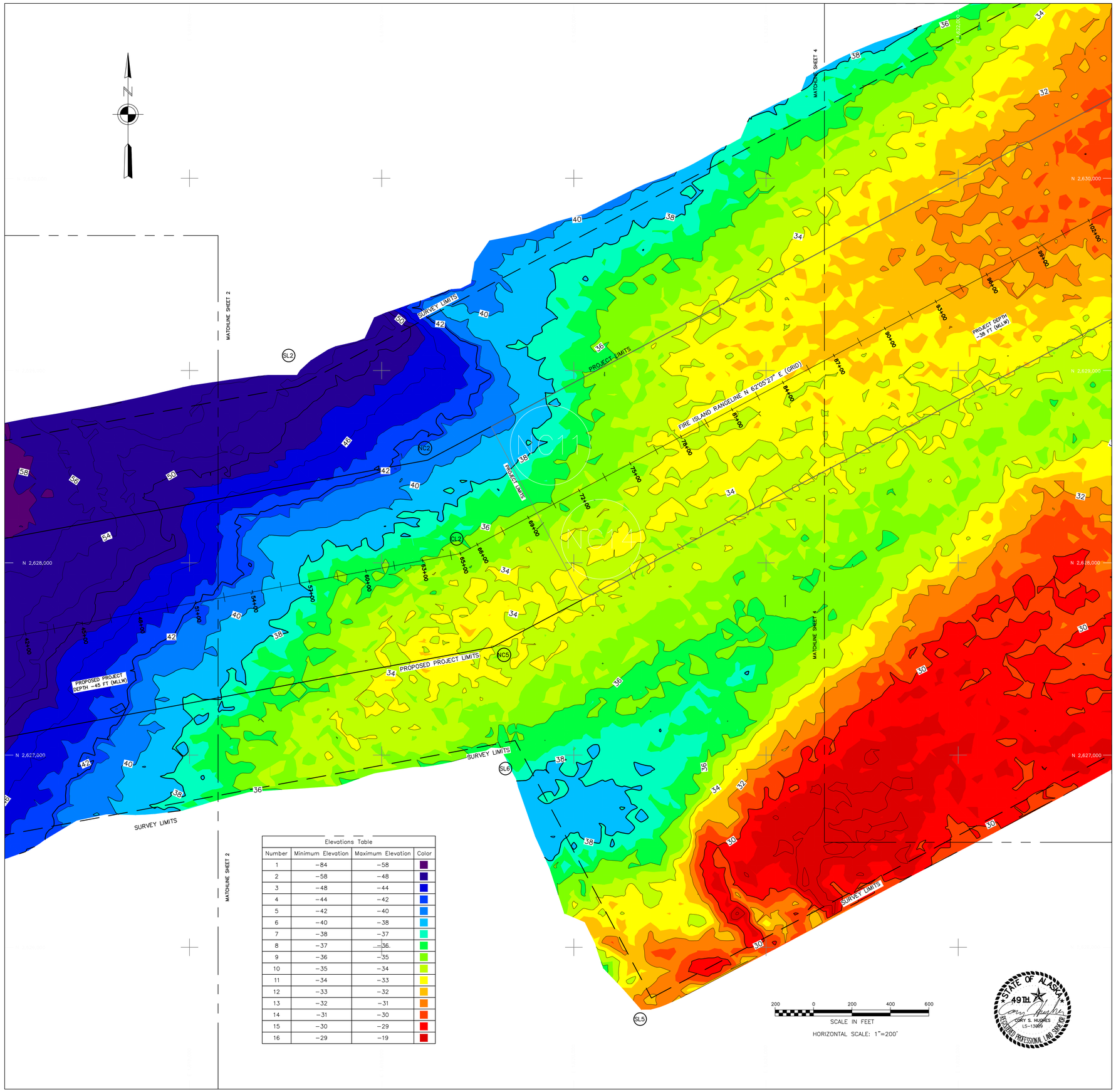
3006-12

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

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V-201
Sheet 7 of 11

CORPS OF ENGINEERS



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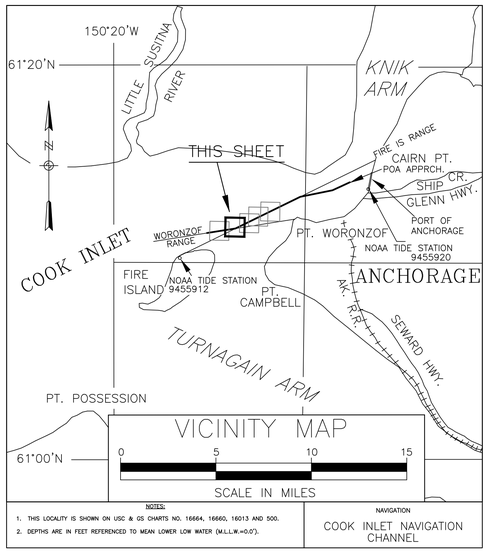

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COOK INLET NAVIGATION CHANNEL

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STATE OF ALASKA 49TH CORY S. HUGHES LS-13089 REGISTERED PROFESSIONAL LAND SURVEYOR

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB-10-0005
CONTRACTOR HUGHES & ASSOCIATES, INC
CITY WASILLA STATE AK
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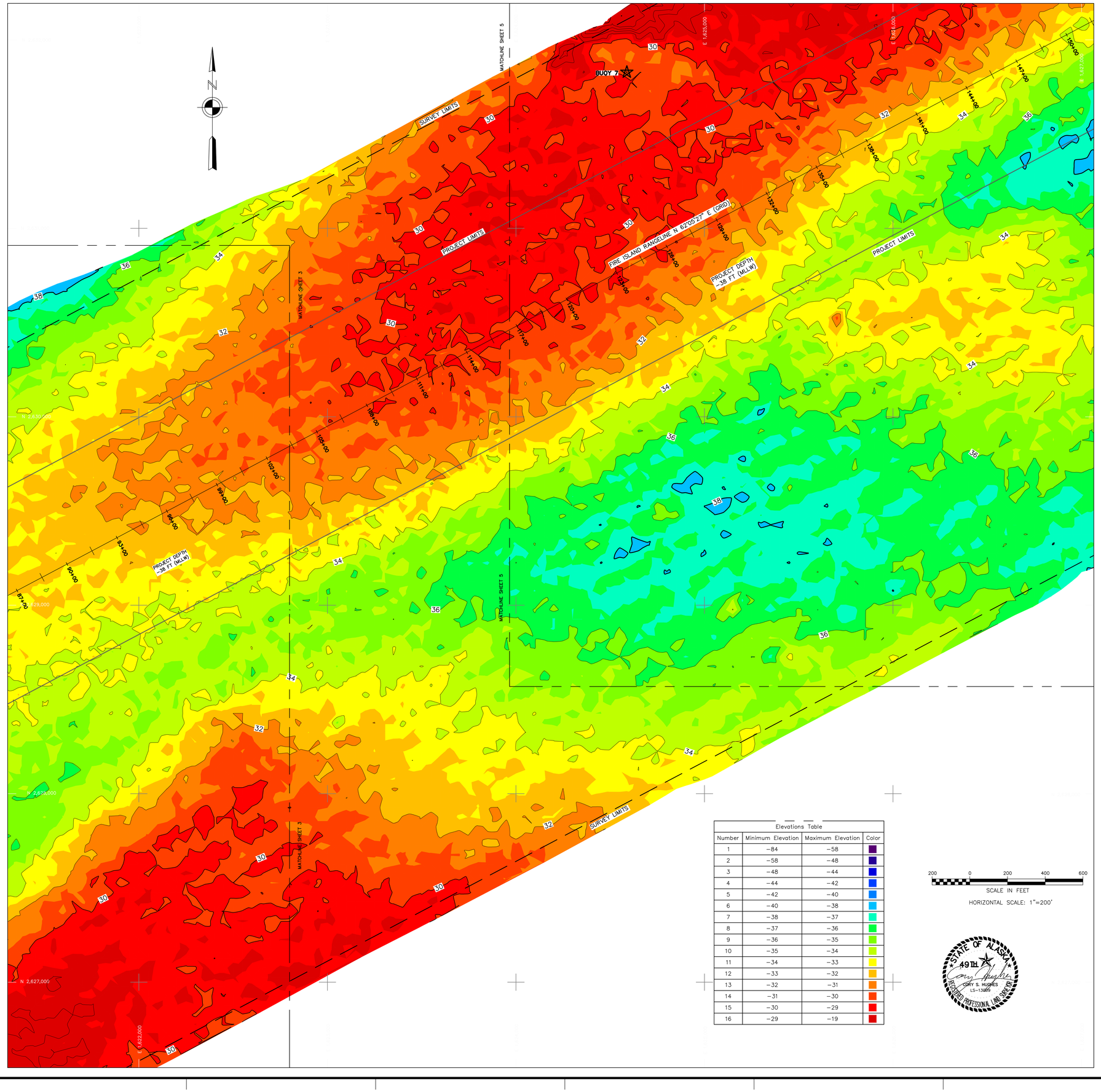
Drawn: REH/BTH
Reviewed: CSH
Chief
Submitted:
Chief
Section
Branch
3006-12

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

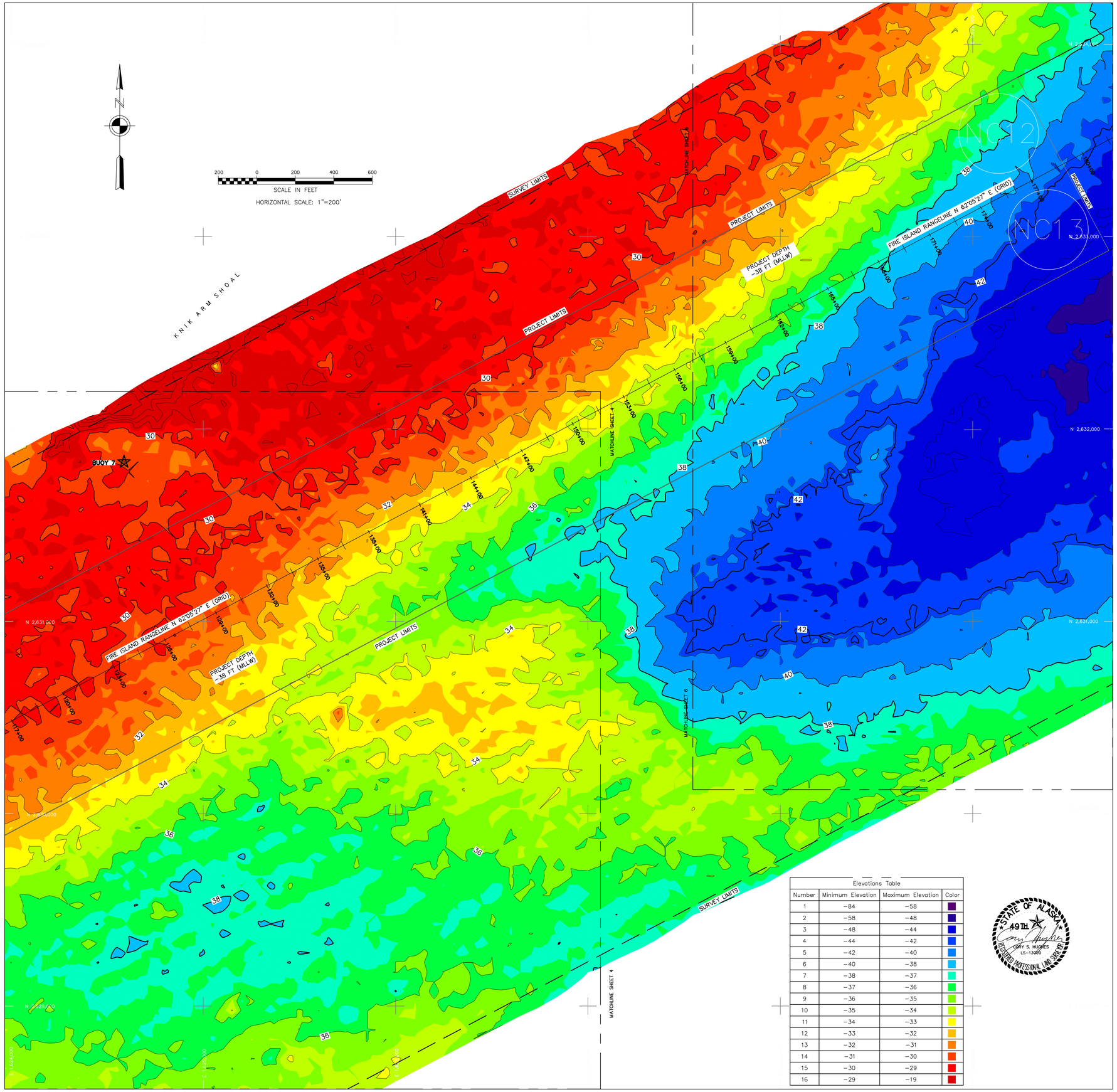
COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V-202
Sheet 8 of 11

CORPS OF ENGINEERS



CORPS OF ENGINEERS



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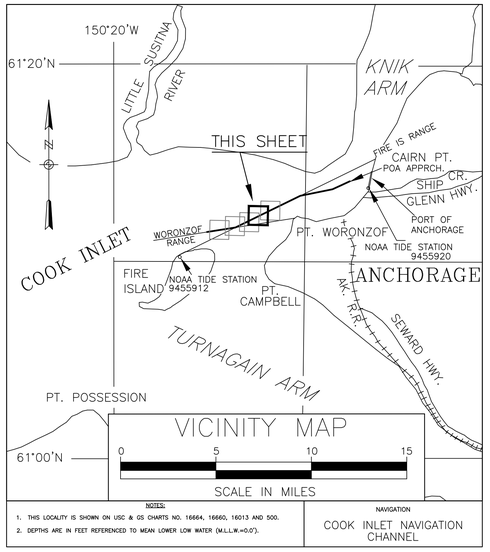
STATE OF ALASKA 49TH
CORY S. HUGHES
LS-13069
REGISTERED PROFESSIONAL LAND SURVEYOR



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COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
SL1	2,628,239.22	1,614,899.26		SL6	2,627,075.24	1,619,694.12	
SL2	2,628,917.45	1,618,564.51		SL7	2,628,239.22	1,615,266.26	
SL3	2,635,431.08	1,630,862.88					
SL4	2,632,186.33	1,632,582.03					
SL5	2,625,736.21	1,620,403.58					

△ CONTROL COORDINATES △					
STATION	NORTHING	EASTING	ELEVATION		DESCRIPTION
			NAVD88	MLLW	
N END 1978	2,646,652.19	1,660,582.43		41.39	USACE SBC
S END 1978	2,644,295.69	1,659,728.19		40.37	USACE SBC
TERRA–10 2008	2,644,971.59	1,660,156.45		80.40	PORT OFFICE ANT. MOUNT
PORT 1989	2,639,936.64	1,656,922.51		39.93	USACE SAC
EQ–1	2,629,995.41	1,643,787.75		–	–
VAN DUSEN GPS 1986	2,621,198.82	1,648,753.69		–	NGS SBC
AWWU 1994	2,629,310.76	1,635,837.68		–	3" ALCAP
NOAA/NOS TIDAL BENCH MARKS AT THE PORT OF ANCHORAGE 9455920					
TIDAL 16 1966	2,644,293	1,659,727	29.96	40.53	USCGS BENCH MARK SBC
B 75 1964	2,644,598	1,660,095	26.36	36.82	USCGS BENCH MARK SBC
NOAA/NOS TIDAL BENCH MARKS AT FIRE ISLAND 9455912					
BM 13 1974	2,620,685	1,605,138		28.41	NOS TIDAL BENCH MARK SBC
RIFE 1960	2,620,520	1,604,180		29.99	USCGS TRI–STA SBC

VOLUME COMPUTATIONS		
PROJECT DEPTH −38' MLLW		CUBIC YARDS
VOLUME AVAILABLE ABOVE PROJECT DEPTH	(−38' MLLW)	1,951,119
VOLUME AVAILABLE BETWEEN PD AND MAXIMUM PAYLINE	(−42.5' MLLW)	1,742,758
VOLUME AVAILABLE ALONG SIDESLOPES	4:1 (H:V)	48465
TOTAL		3,742,342

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

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

Symbol	Action	Description	Date	Approval

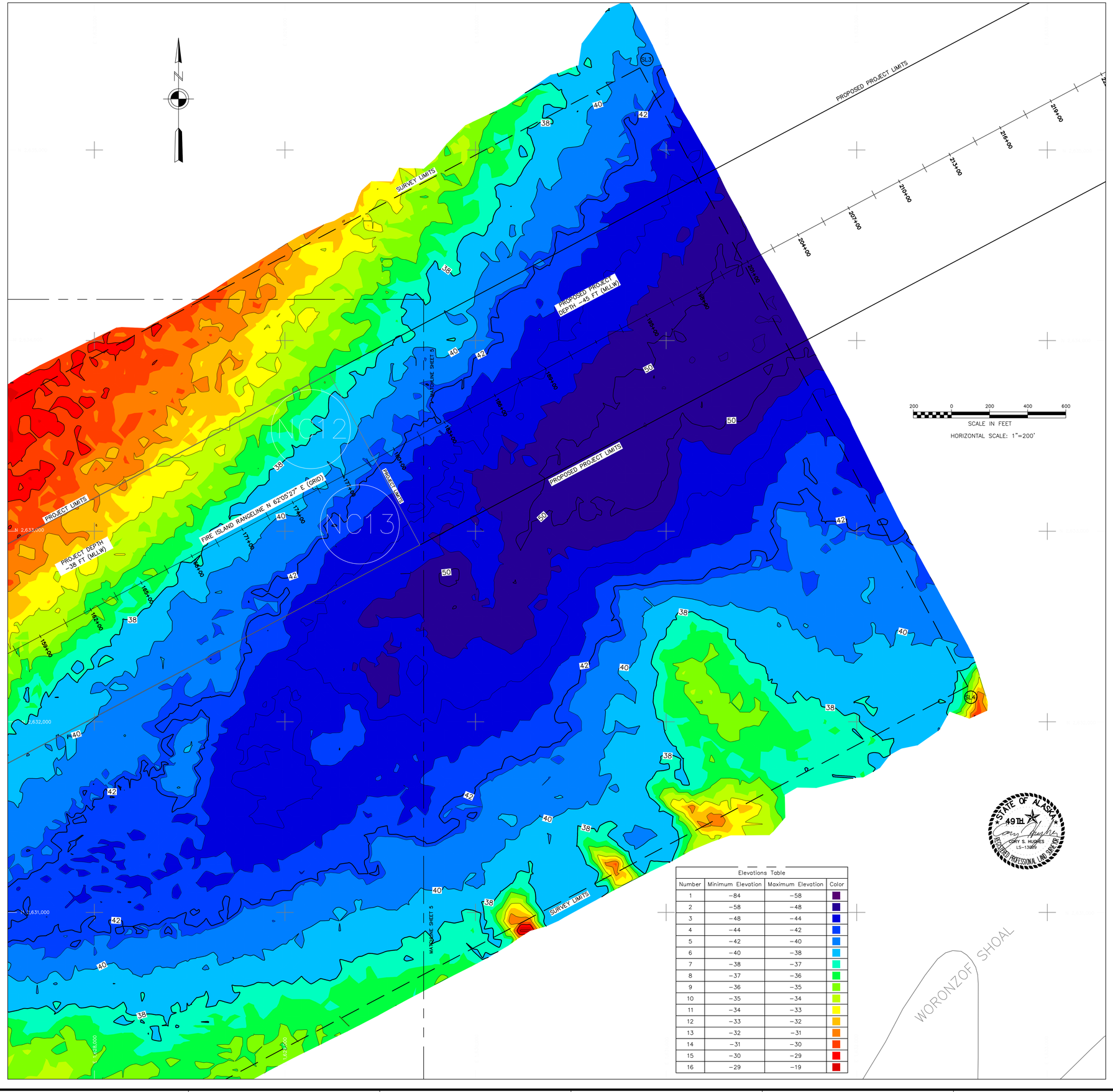
Date: 07/01/12
Dwg Scale: 1" = 200'
Plot Scale: 1:1
File: 2012 CINC Condition Survey.dwg
Section
Branch
3006–12

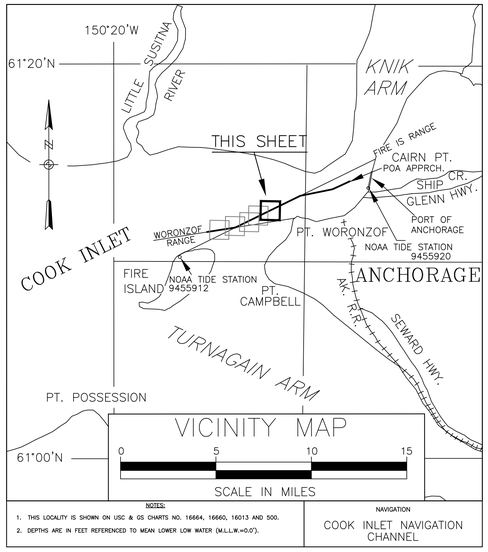
Designed:
Drawn: REH/BTH
Reviewed: CSH
Chief:
Submitted:
Chief:

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

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V–204
Sheet 10 of 11





NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 IN U.S. SURVEY FEET HOLDING USACE SBC "N END 1978" AS N 2,646,652.19, E 1,660,582.43 AND USACE SBC "S END 1978" AS N 2,644,295.65, E 1,659,728.19.
2. VERTICAL CONTROL IS MEAN–LOWER–LOW–WATER (MLLW = 0.0') IN U.S. SURVEY FEET BASED ON NOAA/NOS TIDAL DATUM "9455920 ANCHORAGE, KNIK ARM, COOK INLET, ALASKA", PUBLISHED 04/21/2003, HOLDING USCGS SBC "B 75 1964" AS 36.82' AND NOAA/NOS TIDAL DATUM "9455912 FIRE ISLAND, ALASKA", PUBLISHED 05/21/2004, HOLDING NOS SBC "RIFE 1960" AS 29.99'.
3. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
4. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF SURVEY.
5. SURVEY WAS CONDUCTED ON MAY 28 – JUNE 1, 2012 BY HUGHES AND ASSOCIATES, WASILLA, AK. SOUNDINGS WERE COLLECTED USING AN ODOM ES3 MULTI–BEAM DEPTH SOUNDER (200KHZ, 120–DEGREE SWATH–WIDTH WITH 240, 0.75 DEGREE BEAMS). 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. POSITIONING AND TIDES 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, "B 75 1964". VESSEL NAVIGATION, DATA COLLECTION AND PROCESSING WERE PERFORMED USING HYPACK 2012 INTEGRATED SOFTWARE.
6. ALL BATHYMETRIC DATA HAS BEEN ADJUSTED PROPORTIONALLY ALONG THE PROJECT BASELINE TO ACCOUNT FOR THE DIFFERENCE IN MLLW TIDAL DATUM OF 3.73 FEET BETWEEN THE ABOVE LISTED NOAA TIDAL BENCHMARKS. ALL ADJUSTMENTS ARE BASED ON RTK OBSERVATIONS CONDUCTED AT NOAA BENCH "B 75 1964" AND "RIFE 1960". THE DATA ADJUSTMENT HOLDS 0.0 FEET AT THE PORT OF ANCHORAGE AND 3.73 FEET AT FIRE ISLAND. ALL ADJUSTMENTS WERE ACCOMPLISHED THROUGH THE USE HYPACK 2012 INTEGRATED SOFTWARE.(SEE DIAGRAM ON SHEET 1)

COOK INLET NAVIGATION CHANNEL COORDINATES

COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC11	2,628,708.65	1,619,570.25		NC13	2,632,927.80	1,629,708.02	
NC12	2,633,826.75	1,629,232.30		NC14	2,627,809.70	1,620,045.97	

PROPOSED CHANNEL CENTERLINE

COR.	NORTHING	EASTING	STATION	DESCRIPTION
CL1	2,626,865.50	1,613,018.09	0+00	CENTERLINE WORONZOF RANGELINE
CL2	2,628,048.21	1,619,409.58	65+00	WORONZOF/FIRE ISLAND RANGELINE INTERSECTION
CL3	2,639,188.27	1,640,441.44	303+00	FIRE ISLAND/TRANSITION TO POA APPROACH
CL4	2,641,712.17	1,650,169.36	403+50	POA APPROACH
CL5	2,644,429.31	1,655,293.53	459+50	CENTERLINE POA APPROACH

PROPOSED CHANNEL LIMITS

COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
NC1	2,627,365.51	1,612,925.56	0+00	NC6	2,638,711.03	1,640,626.80	303+00
NC2	2,628,534.04	1,619,240.43	65+00	NC7	2,642,189.38	1,649,983.88	403+50
NC3	2,639,665.52	1,640,256.07	303+00	NC8	2,644,878.56	1,655,055.31	459+50
NC4	2,626,365.49	1,613,110.61	0+00	NC9	2,641,234.95	1,650,354.84	403+50
NC5	2,627,562.38	1,619,578.73	65+00	NC10	2,643,980.06	1,655,531.75	459+50

2012 SURVEY LIMITS

COR.	NORTHING	EASTING	STATION	COR.	NORTHING	EASTING	STATION
SL1	2,628,239.22	1,614,899.26		SL6	2,627,075.24	1,619,694.12	
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CONTROL COORDINATES

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EQ–1	2,629,995.41	1,643,787.75		–	–
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VOLUME AVAILABLE ALONG SIDESLOPES	4:1 (H:V)	48465
TOTAL		3,742,342

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	–84	–58	
2	–58	–48	
3	–48	–44	
4	–44	–42	
5	–42	–40	
6	–40	–38	
7	–38	–37	
8	–37	–36	
9	–36	–35	
10	–35	–34	
11	–34	–33	
12	–33	–32	
13	–32	–31	
14	–31	–30	
15	–30	–29	
16	–29	–19	

STATE OF ALASKA 49TH CORY S. HUGHES LS-13866 REGISTERED PROFESSIONAL LAND SURVEYOR

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

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

Sym	Action	Description	Date	Approd

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Reviewed: CSH
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Submitted:
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Date: 07/01/12
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ANCHORAGE, ALASKA

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
CONDITION SURVEY
MAY 28 – JUNE 1, 2012

Reference number:
V–205
Sheet 11 of 11