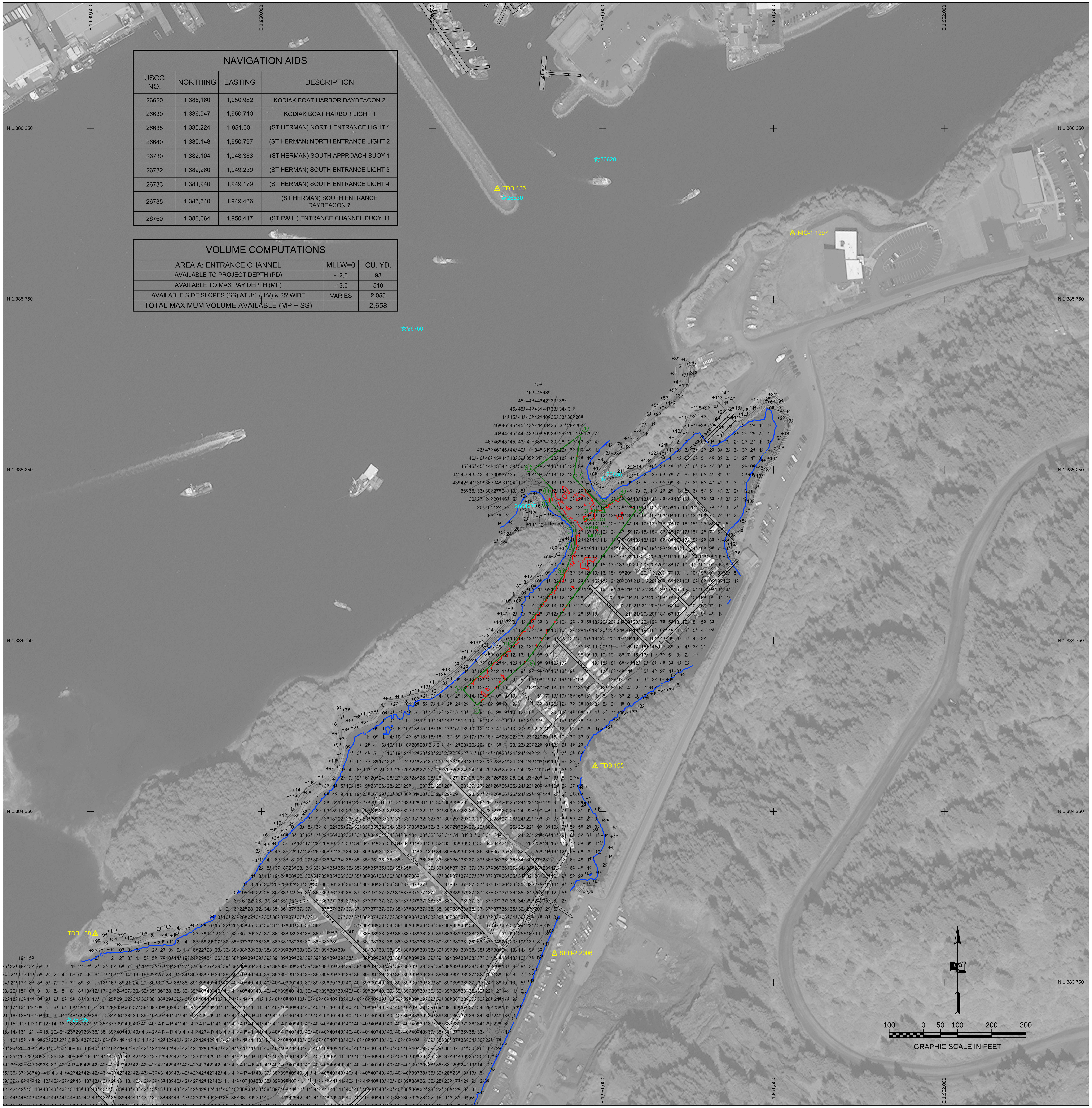
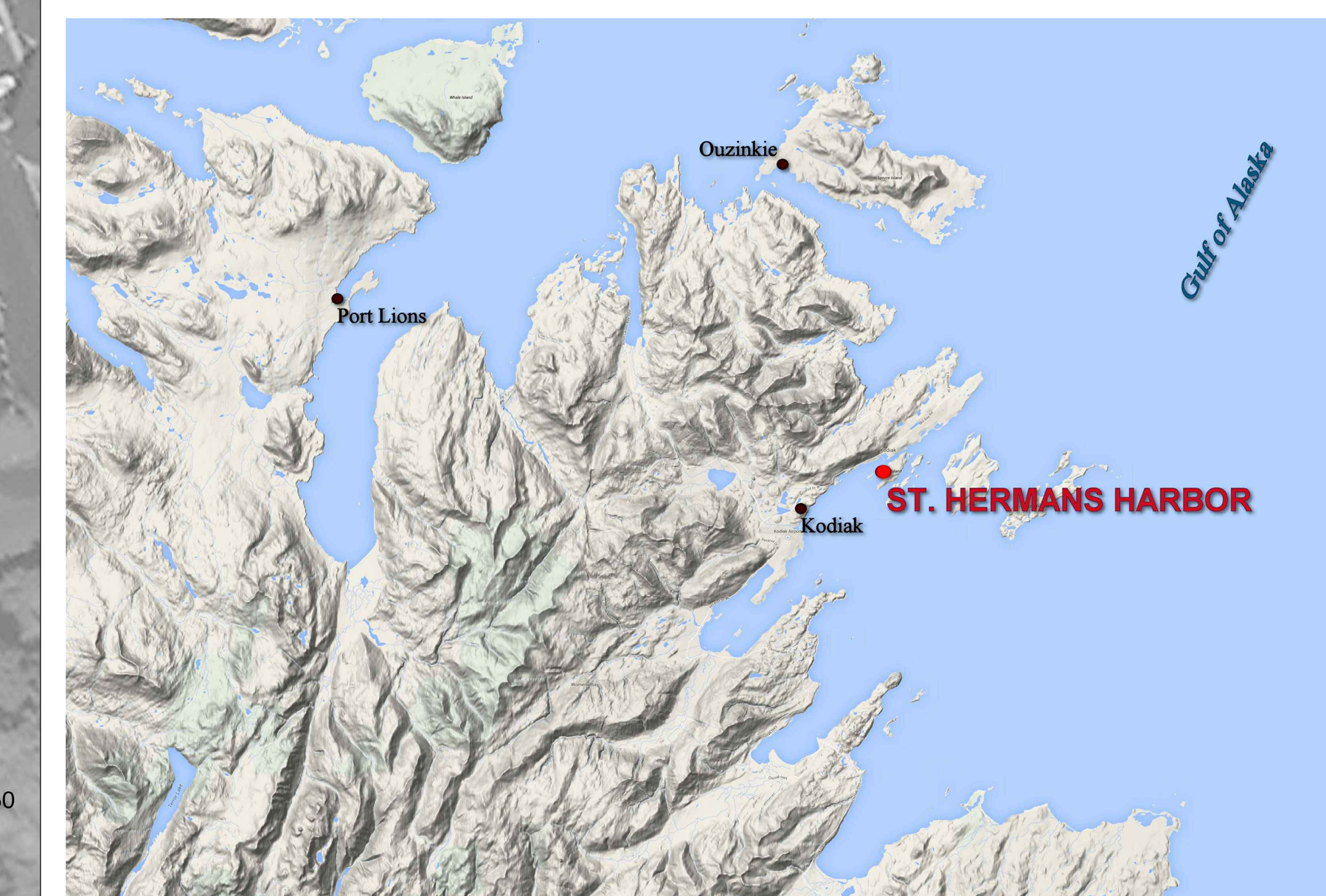


NAVIGATION AIDS

USCG NO.	NORTHING	EASTING	DESCRIPTION
26620	1,386,160	1,950,982	KODIAK BOAT HARBOR DAYBEACON 2
26630	1,386,047	1,950,710	KODIAK BOAT HARBOR LIGHT 1
26635	1,385,224	1,951,001	(ST HERMAN) NORTH ENTRANCE LIGHT 1
26640	1,385,148	1,950,797	(ST HERMAN) NORTH ENTRANCE LIGHT 2
26730	1,382,104	1,948,383	(ST HERMAN) SOUTH APPROACH BUOY 1
26732	1,382,260	1,949,239	(ST HERMAN) SOUTH ENTRANCE LIGHT 3
26733	1,381,940	1,949,179	(ST HERMAN) SOUTH ENTRANCE LIGHT 4
26735	1,383,640	1,949,436	(ST HERMAN) SOUTH ENTRANCE DAYBEACON 7
26760	1,385,664	1,950,417	(ST PAUL) ENTRANCE CHANNEL BUOY 11

VOLUME COMPUTATIONS

AREA A: ENTRANCE CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-12.0	93
AVAILABLE TO MAX PAY DEPTH (MP)	-13.0	510
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	2,055
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		2,658



NOTES

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   LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83, IN US SURVEY FEET HOLDING DOMED SBC "SHH-2 2006" AS N 1,383,833.76', E 1,950,858.32'.

2. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST: "945 7292 KODIAK ISLAND, WOMENS BAY, ALASKA " PUBLISHED 05/02/2014. THIS TIDAL DATUM IS BASED ON THE 2007-2011 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA/NOS TIDAL BENCH MARK "7292 B 1984" (VM#1613) AS 21.05'.
3. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12A) ELEVATIONS HOLDING BRASS DISC "NIC-4 2006" (PID BBBK44) AS 15.61'.
4. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
5. BATHYMETRY WAS COLLECTED MARCH 24, 26-29, AND APRIL 4, 2015. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2022 MULTIBEAM ECHOSOUNDER OPERATING AT 200 KHZ. SOUND VELOCITY THOUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV 320 V4 SYSTEM. DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC AND RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.
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SURVEY CONTROL DATA

STATION	NORTHING	EASTING	MLLW	DESCRIPTION
DB-2 RESET 1989	1,382,108.40	1,949,765.03	64.9ᴗ	2" FLAT SBC
NIC-1 1997	1,385,942.73	1,951,555.54	28.36	3-1/4" DOMED SBC
NIC-4 2006	1,388,617.55	1,954,333.77	16.56	3" DOMED SBC
RANGER 2000	1,381,935.87	1,949,180.93	24.06	3-1/4" DOMED SBC
SHH-2 2006	1,383,833.76	1,950,858.32	21.38	3-1/4" DOMED SBC
SHH-3 2009	1,382,702.24	1,950,183.98	19.73	3-1/4" DOMED SBC
SPH-2 2009	1,386,685.52	1,951,150.86	17.71	3-1/4" DOMED SBC
SYLVA 2000	1,382,712.36	1,948,713.99	21.57	3-1/4" DOMED SBC
TDB 105	1,384,382.86	1,950,977.49	16.23	3-1/2" DOMED USACE BC
TDB 108	1,383,891.39	1,949,513.26	19.77	3-1/2" DOMED USACE BC
TDB 109	1,383,225.88	1,947,948.36	40.4	3-1/2" DOMED USACE BC
TDB 110	1,381,270.47	1,949,482.08	35.80	3-1/2" DOMED USACE BC
TDB 111	1,386,622.19	1,952,584.12	21.3	3-1/2" DOMED USACE BC
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*Bench marks with elevation precision of 0.1' were measured by RTK GNSS.

PROJECT LIMITS

CORNER#	NORTHING	EASTING
1	1,385,354.25	1,950,935.99
2	1,385,229.19	1,950,913.81
3	1,385,138.52	1,951,000.46
4	1,385,173.08	1,951,054.79
5	1,385,130.25	1,951,095.72
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7	1,384,561.34	1,950,631.44
8	1,384,606.15	1,950,591.54

PROJECT LIMITS

CORNER#	NORTHING	EASTING
9	1,384,732.85	1,950,733.66
10	1,384,945.28	1,950,887.59
11	1,385,022.76	1,950,917.02
12	1,385,077.46	1,950,920.49
13	1,385,155.40	1,950,846.00
14	1,385,193.64	1,950,852.79
15	1,385,251.62	1,950,797.38

STATE OF ALASKA
49 TH
(Lewis J. Epps)
07/10/2015
No. 3510
REGISTERED PROFESSIONAL LAND SURVEYOR

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

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W911KB-14-D-0013 / 0021
CONTRACTOR ETRAC INC.
CITY SAN RAFAEL STATE CALIFORNIA
Recommended: MICHAEL E. MUELLER, PRIME CONTRACTOR
Approved: THOMAS A. SLOAN, CHIEF GEOMATICS SECTION
Date: 07/10/2015

REVISION	DATE	DESCRIPTION	BY	APPVD

REVISION	DATE	DESCRIPTION	BY	APPVD

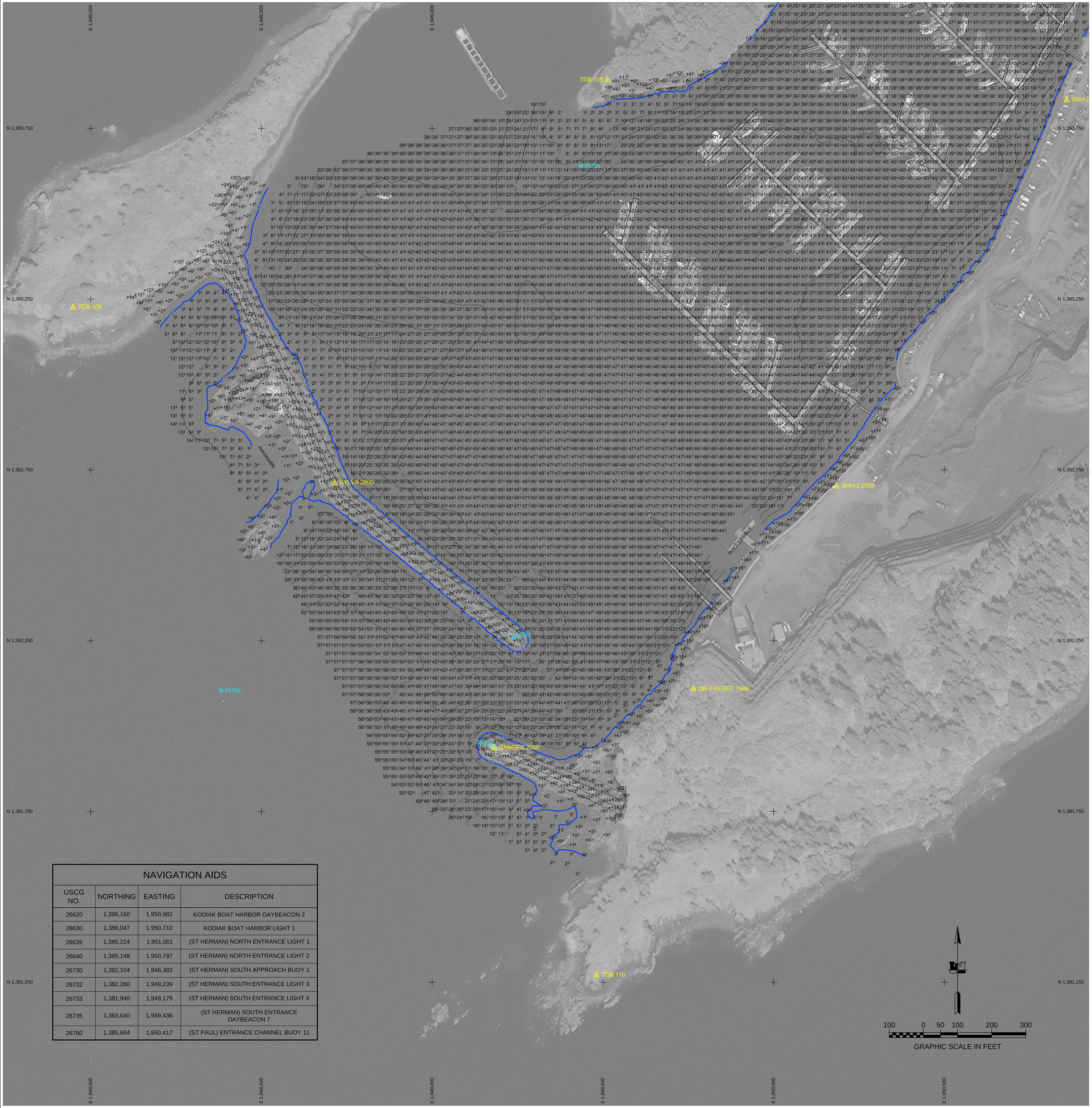
U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
JBER, ALASKA 99506-0898

ETRAC INC.
637 LINDARO ST., STE 100
SAN RAFAEL, CA 94901

SURVEYED BY: Gregory W. Gibson
DATE: 10 July 2015
DRAWN BY: GWG/ENHJ
CHECKED BY: TAS/ENHJ/GWG
UPC: 320418
APPROVED BY: Thomas A. Sloan, Chief Geomatics Section
CONTRACT NO.: W911KB-14-D-0013 / 0021
SCALE: 1" = 100'
PLOT DATE: 7/10/2015
JOB NO.: 1215
SIZE: ANSI E
FILE NAME: 320418-VH01.DWG

KODIAK, ALASKA
ST. HERMANS HARBOR
PROJECT CONDITION SURVEY
MARCH 24 - APRIL 04, 2015

SHEET IDENTIFICATION
5-KOD-92-07-24
Sheet 1 of 4



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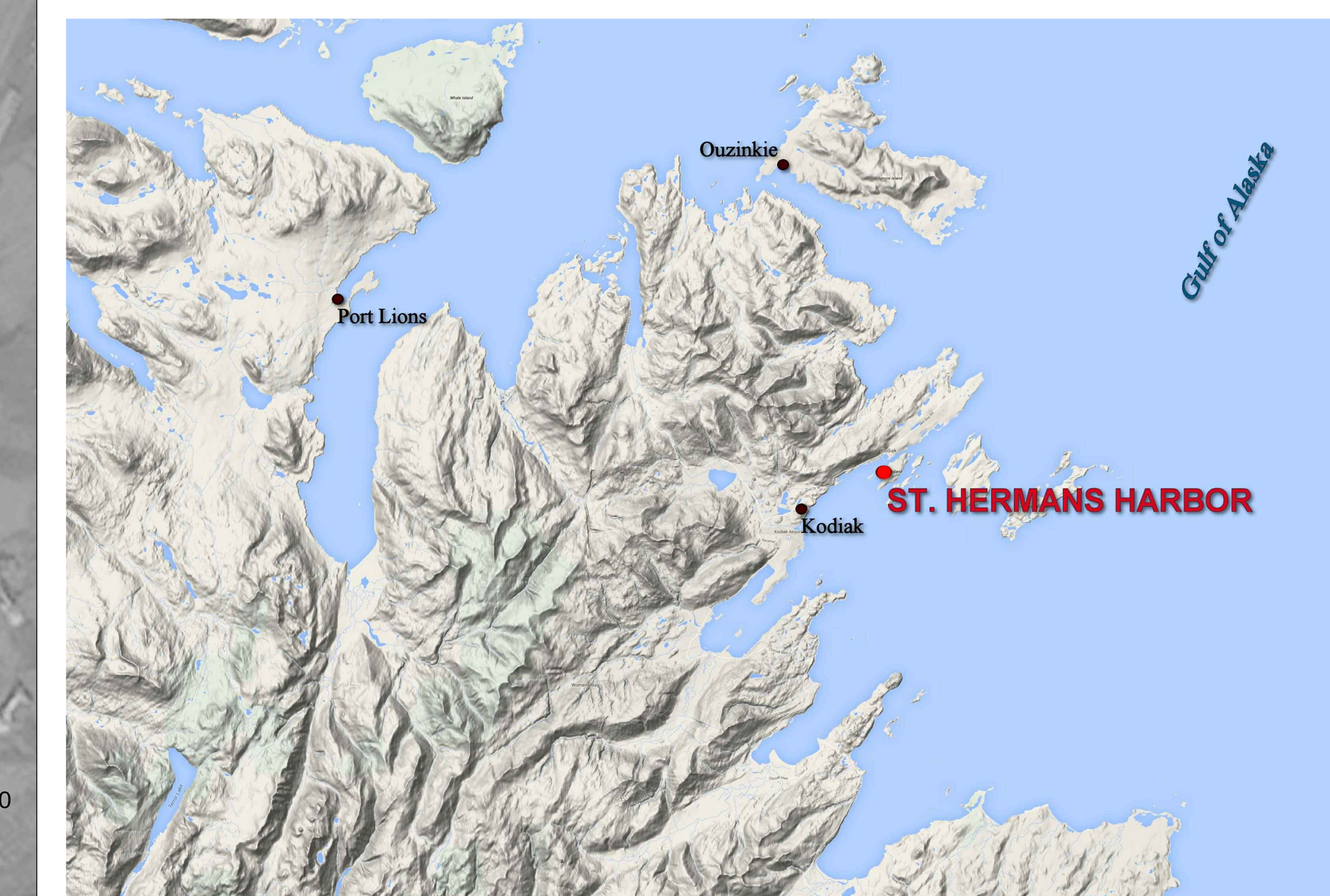

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US Army Corps of Engineers
ALASKA DISTRICT

REVISION	DATE	DESCRIPTION	BY	APPR

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DRAWN BY: GWG/ENHJ
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UPC: 320418
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SCALE: 1" = 100'
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637 LINDARO ST., STE 100
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KODIAK, ALASKA
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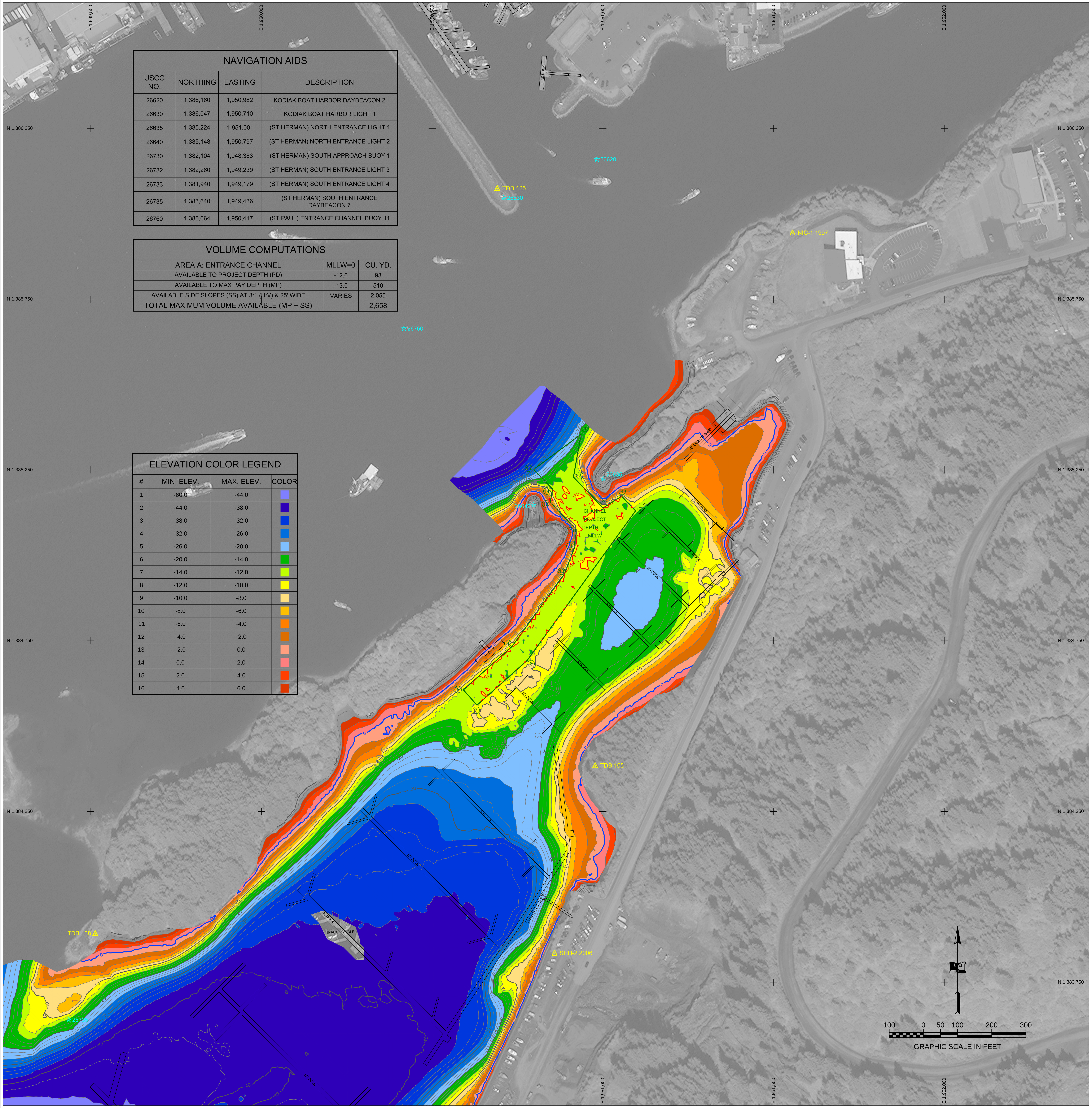
Sheet 2 of 4



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AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	2,055
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		2,658

ELEVATION COLOR LEGEND

#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-60.0	-44.0	
2	-44.0	-38.0	
3	-38.0	-32.0	
4	-32.0	-26.0	
5	-26.0	-20.0	
6	-20.0	-14.0	
7	-14.0	-12.0	
8	-12.0	-10.0	
9	-10.0	-8.0	
10	-8.0	-6.0	
11	-6.0	-4.0	
12	-4.0	-2.0	
13	-2.0	0.0	
14	0.0	2.0	
15	2.0	4.0	
16	4.0	6.0	

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13	1,385,155.40	1,950,846.00
14	1,385,193.64	1,950,852.79
15	1,385,251.62	1,950,797.38

STATE OF ALASKA
49TH
(Lewis J. Epps)
07/10/2015
No. 3510
REGISTERED PROFESSIONAL LAND SURVEYOR

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

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W911KB-14-D-0013 / 0021
CONTRACTOR ETRAC INC.
CITY SAN RAFAEL STATE CALIFORNIA
Recommended: MICHAEL E. MUELLER, PRIME CONTRACTOR
Approved: THOMAS A. SLOAN, CHIEF GEOMATICS SECTION
Date: 07/10/2015

REVISION	DATE	DESCRIPTION	BY	APPVD

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U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
P.O. BOX 6898
JBER, ALASKA 99506-0898

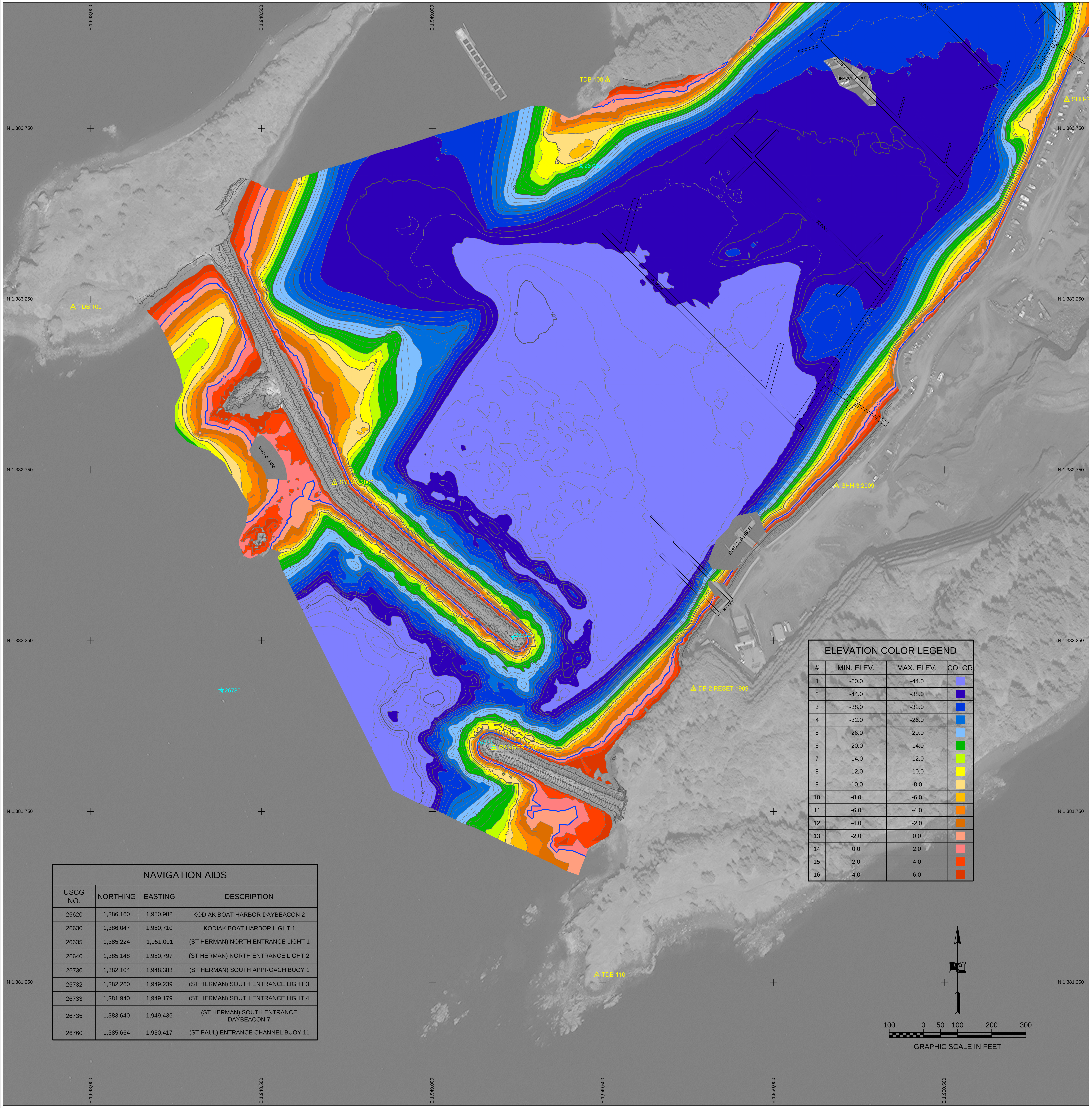
ETRAC INC.
637 LINDARO ST., STE 100
SAN RAFAEL, CA 94901

SURVEYED BY: Gregory W. Gibson
DATE: 10 July 2015
DRAWN BY: GWG/ENHJ
CHECKED BY: TAS/ENHJ/GWG
UPC: 320418
APPROVED BY: Thomas A. Sloan, Chief Geomatics Section
CONTRACT NO.: W911KB-14-D-0013 / 0021
SCALE: 1" = 100'
PLOT DATE: 7/10/2015
JOB NO.: 1215
SIZE: ANSI E
FILE NAME: 320418-VH01.DWG

KODIAK, ALASKA
ST. HERMANS HARBOR
PROJECT CONDITION SURVEY
MARCH 24 - APRIL 04, 2015

SHEET IDENTIFICATION

5-KOD-92-07-24

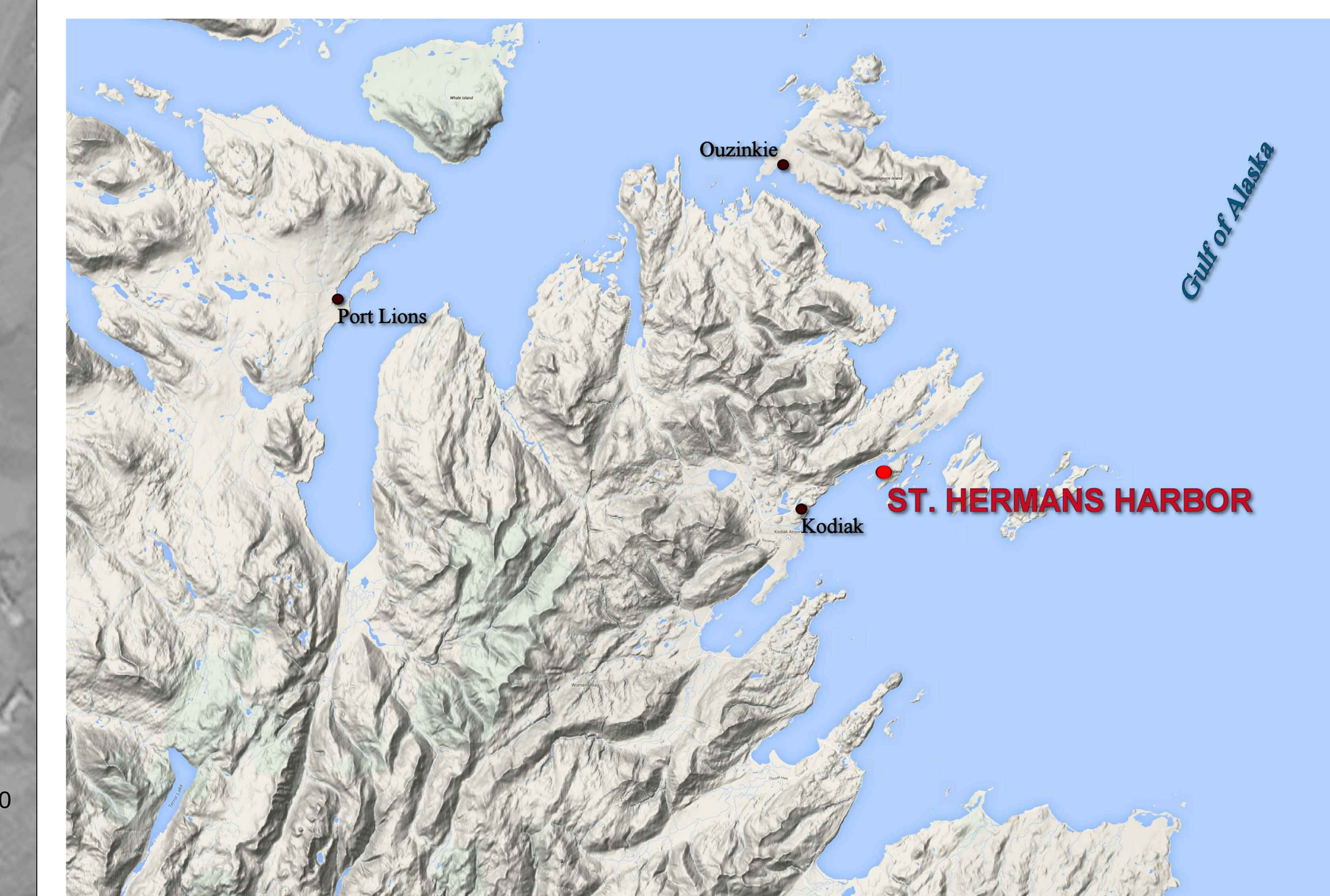


NAVIGATION AIDS

USCG NO.	NORTHING	EASTING	DESCRIPTION
26620	1,386,160	1,950,982	KODIAK BOAT HARBOR DAYBEACON 2
26630	1,386,047	1,950,710	KODIAK BOAT HARBOR LIGHT 1
26635	1,385,224	1,951,001	(ST HERMAN) NORTH ENTRANCE LIGHT 1
26640	1,385,148	1,950,797	(ST HERMAN) NORTH ENTRANCE LIGHT 2
26730	1,382,104	1,948,383	(ST HERMAN) SOUTH APPROACH BUOY 1
26732	1,382,260	1,949,239	(ST HERMAN) SOUTH ENTRANCE LIGHT 3
26733	1,381,940	1,949,179	(ST HERMAN) SOUTH ENTRANCE LIGHT 4
26735	1,383,640	1,949,436	(ST HERMAN) SOUTH ENTRANCE DAYBEACON 7
26760	1,385,664	1,950,417	(ST PAUL) ENTRANCE CHANNEL BUOY 11

ELEVATION COLOR LEGEND

#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-60.0	-44.0	
2	-44.0	-38.0	
3	-38.0	-32.0	
4	-32.0	-26.0	
5	-26.0	-20.0	
6	-20.0	-14.0	
7	-14.0	-12.0	
8	-12.0	-10.0	
9	-10.0	-8.0	
10	-8.0	-6.0	
11	-6.0	-4.0	
12	-4.0	-2.0	
13	-2.0	0.0	
14	0.0	2.0	
15	2.0	4.0	
16	4.0	6.0	



NOTES

1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83 (CORS96), IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE 2003 EPOCH VALUES OF OPUS DB DERIVED STATIONS: "NIC-4 2006" (PID BBBK44) AS NORTHING 1,388,617.55', EASTING 1,954,333.77'; "SHH-3 2009" (PID BBBK45) AS NORTHING 1,382,702.24', EASTING 1,950,183.98'; "TDB 125" (PID BBBK43) AS NORTHING 1,386,072.95', EASTING 1,950,690.54'.

   LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83, IN US SURVEY FEET HOLDING DOMED SBC "SHH-2 2006" AS N 1,383,833.76', E 1,950,858.32'.

2. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST: "945 7292 KODIAK ISLAND, WOMENS BAY, ALASKA " PUBLISHED 05/02/2014. THIS TIDAL DATUM IS BASED ON THE 2007-2011 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA/NOS TIDAL BENCH MARK "7292 B 1984" (VM#1613) AS 21.05'.
3. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12A) ELEVATIONS HOLDING BRASS DISC "NIC-4 2006" (PID BBBK44) AS 15.61'.
4. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
5. BATHYMETRY WAS COLLECTED MARCH 24, 26-29, AND APRIL 4, 2015. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2022 MULTIBEAM ECHOSOUNDER OPERATING AT 200 KHZ. SOUND VELOCITY THOUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV 320 V4 SYSTEM. DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC AND RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.
6. UPLAND SHORELINE AND BREAKWATERS WERE SURVEYED BY MOBILE TERRESTRIAL LASER SCANNING METHODS. DATA WAS COLLECTED USING A RIEGL VZ400 LASER SCANNER. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV 320 V4 SYSTEM. DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE.
7. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
8. MAP SOUNDINGS ARE BINNED AT 24 FEET AND ARE SHOAL-BIASED. CONTOURS ARE BASED ON 12 FEET BINNED SHOAL-BIASED SOUNDINGS. VOLUME SOUNDINGS ARE BINNED AT 3 FEET AND ARE MEAN VALUE SOUNDINGS.

SURVEY CONTROL DATA

STATION	NORTHING	EASTING	MLLW	DESCRIPTION
DB-2 RESET 1989	1,382,108.40	1,949,765.03	64.9ᴗ	2" FLAT SBC
NIC-1 1997	1,385,942.73	1,951,555.54	28.36	3-1/4" DOMED SBC
NIC-4 2006	1,388,617.55	1,954,333.77	16.56	3" DOMED SBC
RANGER 2000	1,381,935.87	1,949,180.93	24.06	3-1/4" DOMED SBC
SHH-2 2006	1,383,833.76	1,950,858.32	21.38	3-1/4" DOMED SBC
SHH-3 2009	1,382,702.24	1,950,183.98	19.73	3-1/4" DOMED SBC
SPH-2 2009	1,386,685.52	1,951,150.86	17.71	3-1/4" DOMED SBC
SYLVA 2000	1,382,712.36	1,948,713.99	21.57	3-1/4" DOMED SBC
TDB 105	1,384,382.86	1,950,977.49	16.23	3-1/2" DOMED USACE BC
TDB 108	1,383,891.39	1,949,513.26	19.77	3-1/2" DOMED USACE BC
TDB 109	1,383,225.88	1,947,948.36	40.4	3-1/2" DOMED USACE BC
TDB 110	1,381,270.47	1,949,482.08	35.80	3-1/2" DOMED USACE BC
TDB 111	1,386,622.19	1,952,584.12	21.3	3-1/2" DOMED USACE BC
TDB 125	1,386,072.95	1,950,690.54	19.77	3-1/2" DOMED USACE BC

*Bench marks with elevation precision of 0.1' were measured by RTK GNSS.

PROJECT LIMITS

CORNER#	NORTHING	EASTING
1	1,385,354.25	1,950,935.99
2	1,385,229.19	1,950,913.81
3	1,385,138.52	1,951,000.46
4	1,385,173.08	1,951,054.79
5	1,385,130.25	1,951,095.72
6	1,384,692.38	1,950,778.43
7	1,384,561.34	1,950,631.44
8	1,384,606.15	1,950,591.54

PROJECT LIMITS

CORNER#	NORTHING	EASTING
9	1,384,732.85	1,950,733.66
10	1,384,945.28	1,950,887.59
11	1,385,022.76	1,950,917.02
12	1,385,077.46	1,950,920.49
13	1,385,155.40	1,950,846.00
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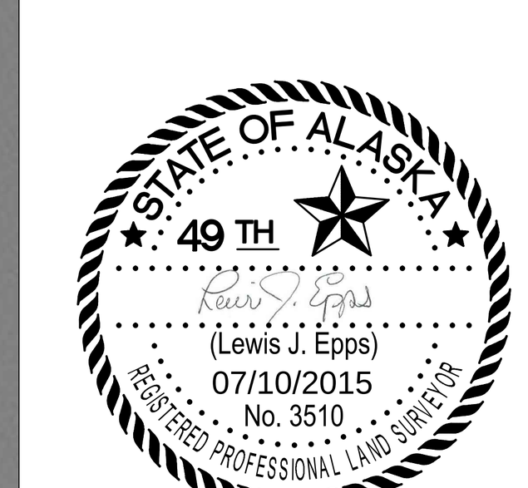
15	1,385,251.62	1,950,797.38



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