



H11065

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. RA-10-14-01

Registry No. H-11065

LOCALITY

State Alaska

General Locality SW Alaska Peninsula and Semidi Is.

Sublocality SE Coast of Nakchamik I. to Atkulik I.

2001

CHIEF OF PARTY

Captain James C. Gardner, NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H-11065

INSTRUCTIONS · The hydrographic sheet should be accompanied by this form,
filled in as completely as possible, when the sheet is forwarded to the office.

FIELD NO.

RA-10-14-01

State AlaskaGeneral Locality Southwest Alaska PeninsulaSublocality SE Coast of Nakchamik Island to Atkulik IslandScale 1:10,000Date of Survey 7/21/01 - 8/7/01Instructions Date 6/1/2001Project No. OPR-P182-RAChange #1 dated 6/12/01, #2 dated 7/6/01, and #3 dated 7/27/01Vessel RA-1(2121) - RA-6(2126)Chief of Party Captain J. C. Gardner, NOAASurveyed by Ship personnel and physical scientists from Pacific Hydrographic BranchSoundings taken by echo sounder, hand lead, pole Knudsen 320M, SB 1180, RESON 8101Graphic record scaled by RAINIER PersonnelGraphic record checked by RAINIER PersonnelEvaluation by L. DeodatoAutomated plot by HP Design Jet 1050CVerification by L. Deodato, R. Davies, R. MayorSoundings in Fathoms at MLLWREMARKS: Time in UTC

**Revisions and annotations appearing as endnotes were generated
during office processing.**

**All depths listed in this report are referenced to
mean lower low water unless otherwise noted.**

Descriptive Report to Accompany Hydrographic Survey H11065

Project OPR-P182-RA-01¹
Southwest Alaska Peninsula and Semidi² Islands, Alaska
Scale 1:10,000
July-August 2001
NOAA Ship RAINIER
Chief of Party: Captain James C. Gardner, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P182-RA-01 dated June 1, 2001³ and the Draft Standing Project Instructions dated April 6, 1998. The survey area is located off the east coast of the Southwest Alaska Peninsula, approximately 10 nm outside of Chignik Bay. This survey corresponds to sheet “Y” in the sheet layout provided with the Letter Instructions.

One hundred percent shallow-water multibeam (SWMB) coverage was obtained in the survey area to meet, and overlap by 5 meters of water depth, Light Detection and Ranging (LIDAR) shoreline data from the concurrent contract survey OPR-P182-KR-01 H11064. Vertical-beam echo sounder (VBES) data was acquired only to define the buffer line for shoreline verification.⁴

Data acquisition was conducted from July 21 to August 7, 2001 (DN 202 to 219).

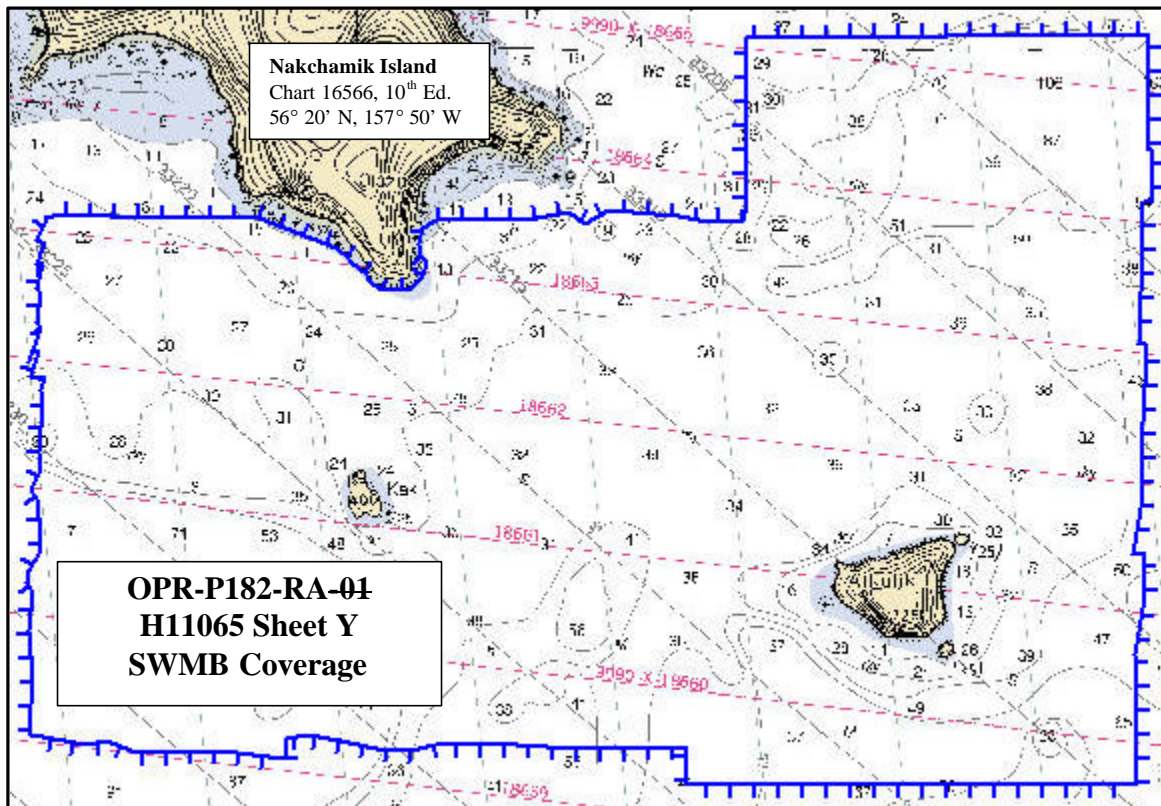


Figure 1. H11065 Survey Limits.

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-P182-RA-01 Data Acquisition and Processing Report*, submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.

B1. Equipment and Vessels

Data were acquired by RAINIER survey launches (vessel numbers 2121, 2122, 2123, 2124, 2125, and 2126). Vessels 2121, 2123, 2124 and 2126 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. Vessels 2122 and 2125 were used to acquire vertical-beam echo soundings (VBES) and detached positions (DPs) for shoreline verification. Vessel 2125 was also used to collect bottom samples, and vessel 2122 also collected a few sound velocity casts for other launches. No unusual vessel configurations or problems were encountered during this survey.

B2. Quality Control

Crosslines

Shallow-Water Multibeam (SWMB) crosslines totaled 22.02 nautical miles, comprising 7.07% of SWMB hydrography (311.63 nm mainscheme lines). The Quality Control Report (CARIS HIPS) for the checkline file averaged 86.919% passing, with a depth tolerance factor of 0.013. Extremely steep and irregular bathymetry contributed to less cross line agreement than desired. The above value also includes some outer beam soundings that were rejected in filtering down to 60 degrees from nadir, but were later re-accepted to close small gaps in coverage. The corresponding value using only beams 8-114 is 92.117% passing. Beams 8-114 comprise 99.95% of all accepted soundings in this survey. The 92.117% value conforms to International Hydrographic Organization Order 1 specifications detailed in Special Publication S-44, Edition 4, as well as NOS Hydrographic Surveys Specifications and Deliverables Manual. Furthermore, the hydrographer believes, through manual examination of the data, the accuracy standards have been met and cross line agreement is good.⁵ See Appendix V⁶ for the detailed report.

Junctions⁷

The following contemporary surveys junction with H11065:

Registry #	Scale	Date	Junction side
H11066	1:40,000	2001	East and South
H11064 LIDAR	1:10,000	2001	Shoreline
H10770	1:10,000	1997	Northwest
H10696	1:20,000	1997 ⁸	North

Survey H10696 junctions well with this survey, with differences generally from one to two fathoms and almost always less than three fathoms. The only two exceptions were a sounding of 41 fathoms near one of 36.1 fathoms from H10696, and a sounding of 91 fathoms near one of 94.6 fathoms from H10696. The areas surrounding this survey's soundings were re-examined in both line and subset mode. While both soundings were from the outer limit of this survey's SWMB coverage and near the outer beams of their lines, both were adequately supported by other soundings. Both differences are near or less than the allowed error at their respective depths. As they are slightly shoaler, the Hydrographer recommends this survey's soundings supercede those of H10696 in these two cases.⁹

Surveys H10770 and H11066 junction well with this survey, with differences generally less than one or two fathoms.¹⁰ The bathymetry is extremely steep and irregular. Nearby soundings that did not agree exactly, but tended to show a slope in the same direction, were considered to have compared well with the junction. Note that H11066 soundings were only corrected with raw observed tides according to the preliminary zoning scheme at the time of this junction comparison.

Survey H11064 had also not been completed at the time of this survey. Only preliminary LIDAR soundings, corrected with predicted tides according to the preliminary zoning scheme, were available for comparison. In addition, due to patchy preliminary LIDAR coverage, direct comparison to every sounding in this survey's final plot was not possible. Where soundings did overlap, agreement was generally within one to two fathoms.¹¹

There were two exceptions to H11064's general agreement. The first was an area just south and southeast of the southern tip of the Nakchamik Island shoreline (roughly 200m radius from 56-18-30.3 N 157-49-19.77 W). Several of this survey's soundings were shoaler by 3 – 6.1 fathoms when compared to H11064 preliminary soundings 2.4 – 10.9 meters away. The full density of this survey's soundings have been double-checked for fliers or other errors, and no mistakes were found. The soundings border and overlap an area designated as foul with kelp. The depth differences are believed to be caused by different tidal conditions allowing different signal penetration through the thick kelp, and possibly by more conservative data cleaning in this survey. It is likely that many of the shoaler soundings from this survey are sonar returns from kelp (see kelp discussion below under "Data Quality Factors").¹²

The second exception to the general agreement between surveys was isolated to the north coast of Kak Island. The MHW line obtained from H11064 was found to be almost 60 meters offshore of this survey's SWMB coverage. There were no other H11064 soundings available in the area for further junction comparison. Important further discussion of this discrepancy is under section D.3 Shoreline. The Hydrographer recommends that soundings from this survey supercede the preliminary soundings from H11064 around the north coast of Kak Island (see also section D.6 Miscellaneous).¹³

Final comparisons will be made at the Pacific Hydrographic Branch (PHB).¹⁴

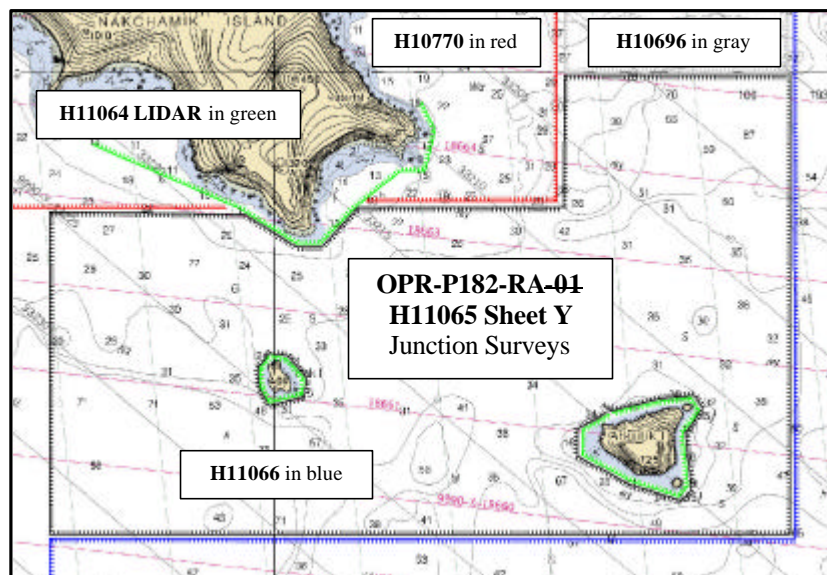


Figure 2. H11065 Junction Surveys.

Data Quality Factors

Almost no unusual conditions were encountered during the survey that affected the expected accuracy and quality of survey data. The only exceptions were kelp around all three islands, and extremely irregular bathymetry especially around the near-shore area of Nakchamik Island. Soundings from kelp were usually cleaned out where a solid, continuous collection of soundings depicted the true bottom below. In some cases, it was impossible to clearly distinguish the true bottom from kelp soundings. In these cases the shoalest soundings were retained, even though they may represent either kelp, true bottom, or both. Extremely irregular bathymetry created shadows and small gaps in coverage that were covered by re-accepting lower quality outer beams that would normally have been filtered out. These soundings were compared to soundings at the other edges of the gaps from other lines and beams closer to nadir to ensure data quality.¹⁵

B3. Data Reduction

Data reduction procedures for survey H11065 conform to those detailed in the *OPR-P182-RA-01 Data Acquisition and Processing Report*.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11065 can be found in the *OPR-P182-RA-01 Horizontal and Vertical Control Report*, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. Differential corrections from U.S. Coast Guard beacons at Kodiak, AK (313 kHz) and Cold Bay, AK (289 kHz) were utilized during this survey. Launch-to-launch DGPS performance checks were performed weekly in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *OPR-P182-RA-01 Horizontal and Vertical Control Report*.

Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide stations at Sand Point, AK (945-9450) and Kodiak, AK (945-7292), served as control for datum determination and as the primary source for water level reducers for survey H11065. Subordinate stations were installed, monitored and removed by contractors as per the Letter Instructions and Statement of Work.

All data were reduced to MLLW using unverified observed tides from station Sand Point, AK (945-9450) and adjusted using a height ratio corrector of 1.26 and a time corrector of -3 minutes. These data were used in creating the tide corrector file "H11065_Observed.tid."

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing. A request for delivery of final approved (smooth) tides for survey H11065 was forwarded to N/OPS1 on August 06, 2001 in accordance with FPM 4.8.¹⁶ A copy of the request is included in Appendix IV.¹⁷

D. RESULTS AND RECOMMENDATIONS

D.1 Automated Wreck and Obstruction Information System (AWOIS) Investigations

No AWOIS items were located within the limits of H11065.¹⁸

D.2 Chart Comparison

Survey H11065 was compared with chart 16566 (10th Ed.; February 20, 1999, 1:77,477).

Chart 16566¹⁹

Depths from survey H11065 generally agreed with depths on chart 16566. The scale of chart 16566 is much smaller than this survey. Charted soundings were few and far between when viewed at scales approaching 1:10,000 and the size of the printed soundings covered almost 200 meters on the ground. Positioning discrepancies of charted islets' shoreline suggests that the positioning accuracy of charted soundings may be on the order of +/- 100 meters. In most instances this survey found a sounding within 100 meters of charted soundings that agreed exactly. In some instances, nearby soundings agreed only to within one to two fathoms. In a few instances on steep slopes, nearby soundings from this survey were within 1-2 fathoms of charted soundings. In these cases the charted sounding was bracketed by soundings from this survey depicting the slope, suggesting that soundings disagreed only because they were taken at slightly different positions along the steep slope.

Because charted soundings were sparse and the bathymetry is highly irregular and steep; this survey found depths between almost all charted soundings that were significantly deeper or shallower even though agreement within 100 meters of the charted depths was good. This can be attributed to increased bottom coverage using SWMB methods. The most extreme cases are three pinnacles in the northeast corner of the sheet, which are as much as 29 fathoms shallower than any surrounding charted depths. These pinnacles with a least depth of 25 fathoms, as well as almost all other variations between charted soundings, do not pose a danger to navigation (the only two exceptions are noted under section D.4 Dangers to Navigation).²⁰

The Hydrographer has determined that data accuracy standards and bottom coverage requirements have been met and survey data are adequate to supersede all charted soundings in their common areas, with no exceptions.²¹

Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.²²

D.3 Shoreline²³

Shoreline Source

The Hydrographer independently created a preliminary shoreline source for this survey based on preliminary LIDAR sounding data from contract survey H11064 supplied by government sub-contractor Tenix LADS Corporation during the course of field operations. The range of the preliminary LIDAR soundings was from approximately 11 meters above MLLW to approximately 20-25 meters depth at MLLW, depending upon water clarity, marine growth such as kelp, and bottom type. The preliminary data supplied had been corrected using predicted tides according to the preliminary zoning scheme.

A final shoreline source was not available for this survey. Final LIDAR data will be submitted by the contractor as the separately registered hydrographic survey H11064, including a MHW line and MLLW line based upon approved tides, as required by the Statement of Work (SOW).²⁴

The preliminary LIDAR sounding data was contoured aboard the RAINIER with MapInfo Vertical Mapper, yielding approximate MHW and MLLW lines. A value of 2.7 meters above MLLW was used to define the MHW line, in accordance with the published value for Anchorage Bay (Chignik, AK). With these MHW and MLLW lines overlaid on the preliminary LIDAR sounding data, isolated offshore soundings shoaler than 0.7 feet depth at MLLW were selected and digitized as rocks for field verification. Isolated soundings between 0.7 feet and 3.7 feet depth at MLLW were digitized as submerged rocks for field verification. Revisions, where insufficient LIDAR soundings existed to support them, were made to the approximate MLLW and MHW contours created by Vertical Mapper. In several areas LIDAR was unable to penetrate to the bottom; either due to kelp, depth, turbidity, wave action, or steepness of slope (reference letter from Tenix LADS Corporation, Appendix V).²⁵ These areas of no data were digitized as polygons and depicted as “potential foul areas” on our preliminary shoreline source. The preliminary shoreline source created by the Hydrographer depicts MLLW and MHW lines, rocks, submerged rocks, and “potential foul areas” as described above and has been recorded in the MapInfo digital file “H11065_LIDAR_Shoreline.tab.” This preliminary shoreline source, in unverified and unrevised form, has been included in this survey’s data submission so that a complete comparison can be made to a final shoreline source when it is available. (See section D6 Miscellaneous for recommendations relating to final LIDAR data and final shoreline source).

Shoreline Verification

Shoreline verification was conducted near predicted low water in accordance with the Standing Project Instructions and FPM 6.1 and 6.2. Detached positions (DPs) taken during shoreline verification were recorded in HYPACK and on DP forms, and processed in HPS. These indicate confirmation of or revisions to features, and features not found in the preliminary LIDAR data. DP forms are included in Section I of the *Separates to be Included with Survey Data*. A detailed Detached Position and Bottom Sample plot, in both paper copy²⁶ and MapInfo digital format, is provided showing all detached positions and bottom samples with notes relating to each feature, and showing preliminary shoreline source and updates and notes. Depth soundings supporting shoreline verification results are depicted on the final sounding plot²⁷ along with the preliminary shoreline source, updates to the shoreline and DP’s .

Everything depicted on the preliminary shoreline source was investigated to some degree by RAINIER personnel during field verification. The MHW and MLLW lines were used for reference purposes, limited field verification, and further classification of MLLW features, such as to ledge or beach.²⁸ The approximate MHW line was also investigated for its accuracy, and detached positions were taken at or near MHW in order to indicate where a significant discrepancy could be expected between the LIDAR MHW and that observed during survey operations. The labels of these DP’s on the plot and in digital files contain the additional note, “(MHW).”²⁹ All DP’s not containing this note were collected at MLLW as described above. “Potential foul areas” were investigated during shoreline verification, classified as “foul with kelp” where appropriate, or considered for full launch hydrography where warranted.³⁰

Rocks and submerged rocks depicted on the preliminary shoreline source were treated the same for field verification purposes and no distinction is made on the plots, in other digital files, or in the discussion below under “Source Shoreline Changes and New Features.”

The preliminary shoreline source was compared to chart 16566 10th Edition, the largest scale chart available, and the T-Sheet TP00914 prior to commencing verification. The preliminary shoreline source was observed to depict everything on the chart and T-sheet and much more. The only exception was one

rock and one segment of shoreline from the T-sheet. These were recorded in MapInfo tables “H11065_TS_Rock_to_verify.tab” and “H11065_TS_Shoreline_segment.tab.” They were verified along with all other features and shoreline in the preliminary shoreline source as described above.³¹

Based on the results of field verification, the Hydrographer’s recommendations for changes are shown on the DP and BS plot, the final sounding plot, and in the MapInfo digital files named “H11065_Shoreline_Updates.tab,” “H11065_Shoreline_Notes.tab,” “H11065_Features.tab,” and “H11065_Shoreline.tab.”³²

Source Shoreline Changes and New Features

The MLLW line around all three islands was usually steep, solid or slightly broken rock. Its entire length, which was not classified in the preliminary shoreline source, has been characterized as ledge except for short segments of beach or boulder as noted on the DP and BS plot and MapInfo tables.³³

The Hydrographer recommends areas depicted on the preliminary shoreline source as “potential foul areas” be removed.³⁴ A new line, depicting the limit of any area that has been field verified as truly foul, is shown on the plots and in the MapInfo table “H11065_Shoreline_Updates.tab.” The limit was defined by the VBES “buffer line,” and a DP in one case, and modified by the extent of SWMB coverage where propeller-driven multi-beam launches were able to penetrate further into kelp areas than jet-driven single-beam launches. In some “potential foul areas” only isolated kelp was found, depicted by a single kelp symbol on the plots and in the digital file. In three “potential foul areas” no kelp was found; however, ocean swells tended to be reflected into and concentrated in these areas. The result was whitewater, foam and conditions unsafe for the survey launch to enter. It should be noted that on a day when swell size and direction were unusually favorable, a launch was able to enter one of these areas to collect a DP. A detailed discussion of the shoreline and features of each individual island follows:

Special consideration should be given to the many rocks depicted on the preliminary shoreline source and, as a result of field verification, the recommendations made below. As described in the section “Shoreline Source,” the basis for the rocks was preliminary LIDAR shoal soundings. The LIDAR contractor explained that many of these preliminary soundings are expected to be returns from kelp and not the true bottom. He stated that additional post-processing will likely be able to better distinguish between the two. Therefore many of these shoal soundings, and the rocks that were based on them, will not be included in the final LIDAR data set and the final shoreline source.³⁵ The Hydrographer’s recommendations concerning rocks should be read with this in mind. Below are more details and suggestions on how final LIDAR data may compare with the Hydrographer’s current recommendations.

The contractor’s LIDAR technology records more information about each sounding than current multi-beam technology in use aboard the RAINIER. In addition to the elapsed time of each return recorded by RAINIER multi-beam systems, LIDAR records the full “wave form signature” of each individual return. In many cases the “wave form signature” can indicate what kind of surface the signal bounced off of. In other survey environments the “wave form signature” has been used to characterize each sounding as being from sand, mud, rock, choral, etc. The LIDAR contractor stated their intention to do the same in this area to distinguish kelp soundings from bottom soundings. At the time the preliminary LIDAR data was provided to the RAINIER, insufficient ground-verified data was available for the contractor to have good confidence in classifying the local kelp “wave form signature.” In order to collect adequate ground-verified data, a LIDAR representative accompanied RAINIER personnel during shoreline verification. His field notes on particular LIDAR soundings will be used in additional post-processing to better distinguish kelp soundings from soundings off the bottom.

As a result, the final data submitted by the contractor may depict far fewer rocks than are in the preliminary shoreline source used during this survey. Thus, many of the rocks listed below that were “not seen” and were not approachable for disproval due to kelp, may not appear in the final LIDAR data. In these cases, when the benefit of final data is available, it is suggested that it would be appropriate for the Cartographer not to depict the rocks on the chart, even though in this report the Hydrographer recommends retaining them.³⁶ All recommendations in this report related to survey H11064 are based only on the preliminary data available at the time of this survey (see also section D.6 Miscellaneous).³⁷

Kak Island

The MHW line depicted on the preliminary shoreline source along the north coast of Kak Island was found to be as much as 60 meters offshore of this survey’s SWMB coverage and MHW DP’s. A representative of the LIDAR contractor stated that the collection of soundings, which this segment of MHW line was based on, looked like an obvious processing artifact or anomaly. He stated that it was consistent with the preliminary nature of the data, and that it would most likely not exist in the final submission of LIDAR data. A new MHW line was drawn based on MHW DP fix numbers 20158, 20046, 20047 and 20140, and additionally supported by SWMB coverage shown in a 5-meter resolution Digital Terrain Model (DTM) of all accepted multi-beam soundings in the area.. Please note that DP 20158 was taken under a cliff overhanging the shoreline by approximately 6 meters. The new MHW line is shown on both plots and in the MapInfo “H11065_Shoreline_Updates.tab” digital file. The Hydrographer recommends revising the preliminary MHW line in this area as described above.³⁸

The following TS/charted rock was disproved by 100% SWMB coverage over the area. The Hydrographer recommends removing the rock listed below from the chart.³⁹

1 - TS rock at 56-17-07.03 N 157-49-40.09 W (572,566.00 E, 6,238,449.41 N)

The following preliminary LIDAR rock was not found, and was not approachable due to heavy kelp. DP fix number 20044 defines the extent of an area foul with kelp which is 4.6 meters offshore of this rock. Though suspected of being a sounding off of kelp, the Hydrographer must recommend charting the rock listed below⁴⁰(see section D.6 Miscellaneous):

1 - Preliminary LIDAR rock at 56-17-14.65 N 157-49-43.11 W (572,510.00E 6,238,684.00N)

Nakchamik Island

The following preliminary LIDAR rocks were not found, and were not approachable due to heavy kelp. All these fall within an area foul with kelp. No disprovals were attempted for these unapproachable rocks. All are suspected to be soundings off of kelp and not the true bottom; however, with the data currently available the Hydrographer must recommend retaining the thirteen rocks listed below for publication on the chart⁴¹(see section D.6 Miscellaneous):

- 1 - Preliminary LIDAR rock at 56-18-55.34 N 157-50-41.78 W (571,449.00 E, 6,241,780.00 N)
- 2 - Preliminary LIDAR rock at 56-18-54.55 N 157-50-36.28 W (571,544.00E, 6,241,757.00 N)
- 3 - Preliminary LIDAR rock at 56-18-50.92 N 157-50-28.65 W (571,677.00 E, 6,241,647.00 N)
- 4 - Preliminary LIDAR rock at 56-18-47.06 N 157-50-20.74 W (571,814.86 E, 6,241,530.05 N)
- 5 - Preliminary LIDAR rock at 56-18-42.36 N 157-50-09.53 W (572,010.00 E, 6,241,388.00 N)
- 6 - Preliminary LIDAR rock at 56-18-42.04 N 157-50-06.16 W (572,068.00 E, 6,241,379.01 N)
- 7 - Preliminary LIDAR rock at 56-18-39.44 N 157-50-01.82 W (572,144.00 E, 6,241,300.00 N)
- 8 - Preliminary LIDAR rock at 56-18-39.65 N 157-50-00.01 W (572,175.00 E, 6,241,307.00 N)
- 9 - Preliminary LIDAR rock at 56-18-38.01 N 157-49-56.97 W (572,228.00 E, 6,241,257.00 N)

- 10 - Preliminary LIDAR rock at 56-18-29.86 N 157-49-33.83 W (572,630.00 E, 6,241,012.00 N)
- 11 - Preliminary LIDAR rock at 56-18-31.83 N 157-49-33.54 W (572,634.00 E, 6,241,073.00 N)
- 12 - Preliminary LIDAR rock at 56-18-31.89 N 157-49-26.14 W (572,761.00 E, 6,241,077.00 N)
- 13 - Preliminary LIDAR rock at 56-18-47.47 N 157-49-24.15 W (572,787.00 E, 6,241,559.00 N)

The following preliminary LIDAR rocks were suspected of being soundings off of kelp, and were disproven by 100% SWMB coverage over the surrounding area. The Hydrographer recommends removing the three rocks listed below:⁴²

- 1 - Preliminary LIDAR rock at 56-18-31.56 N 157-49-21.79 W (572,836.00 E, 6,241,068.00 N)
- 2 - Preliminary LIDAR rock at 56-18-33.35 N 157-49-16.20 W (572,931.00 E, 6,241,125.00 N)
- 3 - Preliminary LIDAR rock at 56-18-39.16 N 157-49-11.14 W (573,015.00 E, 6,241,306.00 N)

Atkulik Island

The following preliminary LIDAR rocks were not found, and were not approachable due to thick kelp. All were inside areas foul with kelp or foul with rocks and kelp. Though suspected of being soundings off of kelp, the Hydrographer must recommend retaining the seven rocks listed below for publication on the chart⁴³ (see section D6 Recommendations):

- 1 - Preliminary LIDAR rock at 56-16-46.23 N 157-44-34.64 W (577,830.00 E, 6,237,899.00 N)
 - 2 - Preliminary LIDAR rock at 56-16-54.36 N 157-43-58.20 W (578,463.00 E, 6,238,172.00 N)
 - 3 - Preliminary LIDAR rock at 56-17-00.56 N 157-43-41.07 W (578,743.00 E, 6,238,359.00 N)
 - 4 - Preliminary LIDAR rock at 56-17-01.85 N 157-43-33.70 W (578,869.00 E, 6,238,401.00 N)†
 - 5 - Preliminary LIDAR rock at 56-17-02.12 N 157-43-29.04 W (578,949.00 E, 6,238,411.00 N)†
 - 6 - Preliminary LIDAR rock at 56-16-25.24 N 157-44-12.77 W (578,218.00 E, 6,237,257.00 N)
 - 7 - Preliminary LIDAR rock at 56-16-23.94 N 157-44-09.38 W (578,277.00 E, 6,237,218.00 N)
- † corresponds to DP fix numbers 20094 and 20095 intended as disprovals, but not adequate to disprove

The following preliminary LIDAR rocks were not found. Isolated kelp was found at or within 20 meters of their locations. However, no disproof was completed. Therefore, though they are suspected of being soundings off of kelp, the Hydrographer must recommend retaining the three rocks listed below for publication on the chart⁴⁴ (see section D.6 Miscellaneous):

- 1 - Preliminary LIDAR rock at 56-16-52.29 N 157-44-29.32 W (577,918.00 E, 6,238,088.01 N)
 - 2 - Preliminary LIDAR rock at 56-16-52.45 N 157-44-25.54 W (577,983.00 E, 6,238,094.00 N)
 - 3 - Preliminary LIDAR rock at 56-16-32.84 N 157-43-31.82 W (578,918.00 E, 6,237,505.00 N)†
- † corresponds to DP fix number 20089 intended as a disproof, but not adequate to disprove

The following preliminary LIDAR rocks were suspected of being soundings off of isolated kelp found in the area, and were disproven by visual and VBES star pattern searches. The Hydrographer recommends removing the three rocks listed below:⁴⁵

- 1 - Preliminary LIDAR rock at 56-16-54.59 N 157-44-07.61 W (578,290.00 E, 6,238,166.00 N)
- 2 - Preliminary LIDAR rock at 56-16-54.83 N 157-44-05.45 W (578,327.00 E, 6,238,174.00 N)
- 3 - Preliminary LIDAR rock at 56-17-00.75 N 157-43-43.63 W (578,699.00 E, 6,238,364.00 N)

The following preliminary LIDAR rocks were disproven by 100% SWMB coverage of the surrounding area. The Hydrographer recommends removing the two rocks listed below:⁴⁶

- 1 - Preliminary LIDAR rock at 56-16-31.14 N 157-44-36.53 W (577,806.00 E, 6,237,432.00 N)

2 - Preliminary LIDAR rock at 56-16-27.22 N 157-43-29.10 W (578,968.00 E, 6,237,332.00 N)

The following preliminary LIDAR islet was depicted as only 7.6 meters across. It is believed to have been an artifact of the contouring process used to generate the preliminary shoreline source. There are no preliminary LIDAR soundings to support its existence. It has been disproven by 100% SWMB of the surrounding area. The Hydrographer recommends removing the islet listed below:⁴⁷

1 - Preliminary LIDAR islet at 56-16-20.73 N 157-43-34.16 W (578,884.70 E, 6,237,130.09 N)

Charted Features

There were no charted features digitized for field verification during this survey. After field verification of the preliminary shoreline source, charted shoreline was compared and found to differ by as much as 170 meters. The islets and coves of Atkulik Island were the worst effected. The Hydrographer recommends that the final LIDAR shoreline, after it has been compared and verified against this survey by PHB, supersede all charted shoreline and features from chart 16566.⁴⁸

Recommendations

The Hydrographer recommends that the shoreline as depicted on the Detached Position and Bottom Sample plot and final sounding plot, and in the associated digital MapInfo files, supersede and complement the shoreline information compiled on the preliminary shoreline source, and be used to verify, revise, and complement the final LIDAR data submitted by the contractor.⁴⁹

D.4 Dangers to Navigation

Two dangers to navigation were found and reported to the Marine Chart Division for verification and final submission to the Seventeenth Coast Guard District on February 13, 2002. A copy of the preliminary Danger to Navigation Report is included in Appendix I.⁵⁰

D.5 Aids to Navigation

No aids to navigation (ATONs) are located within the limits of H11065.⁵¹

D.6 Miscellaneous

Bottom samples were collected and are depicted on the Detached Position and Bottom Sample Plot.⁵²

Additional office work outside the usual processing procedure is recommended. Final LIDAR data from the contractor should be forwarded to NGS Remote Sensing Division. A final shoreline source should be compiled or approved by NGS with the horizontal and vertical control and accuracy of that data fully described.⁵³ The final shoreline source should then be forwarded to PHB for comparison to the following:

1) preliminary shoreline source used during this survey, 2) the Hydrographer's verifications and recommendations for changes, including all rocks and shoreline features, and 3) depth sounding agreement in common areas with this "junctioning" survey. Special attention should be paid to the North coast of Kak Island as discussed under section B.3⁵⁴ Quality Control: Junctions and section D.3 Shoreline: Source Shoreline Changes and New Features. Special attention should also be paid to the rocks as discussed under section D.3 Shoreline: Source Shoreline Changes and New Features.⁵⁵

E. APPROVAL


As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2001.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

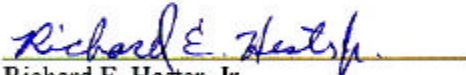
Survey H11065 is complete and adequate to supersede charted soundings in their common areas. No additional field work is required for this survey.⁵⁶

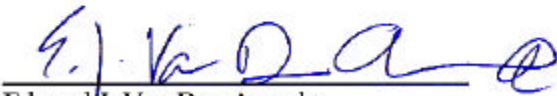
Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-P182-RA-01	18 February, 2002	N/CS34
Horizontal and Vertical Control Report for OPR-P182-RA-01	18 February, 2002	N/CS34
Coast Pilot Report for OPR-P182-RA-01	18 February, 2002	N/CS26

Approved and Forwarded: 
 James C. Gardner
 Captain, NOAA
 Commanding Officer

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

Survey Sheet Manager: 
 Richard E. Hester, Jr.
 Ensign, NOAA

Field Operations Officer: 
 Edward J. Van Den Ameele
 Lieutenant, NOAA

Revisions Compiled During Office Processing and Certification

¹ Revise to Project OPR-P182-RA

² Delete (and Semidid). Project Instructions specifies General Locality as Southwest Alaska Peninsula.

³ Include Change Nos. and dates; Change #1 dated 6/12/01, #2 dated 7/6/01, and #3 dated 7/27/01

⁴ Concur

⁵ Concur

⁶ Filed with the hydrographic data.

⁷ The junction with survey H11066 is complete. Surveys H10696 and H10770 were processed previously and the junctions were not formally completed. A few soundings have been transferred in black to the present survey from surveys H11066, H10696, and H10770 to better delineate the bottom configuration. These soundings have been assigned a unique level and named according to their source. Survey H11064 is a contract lidar survey which falls in the near shore areas around the three islands within the survey area. Comparison with the lidar survey shows good depth agreement.

⁸ Revise to 1996

⁹ Concur- After application of approved tides, a comparison with H10696 reflects satisfactory agreement with standard depth curves and soundings within the common area. The evaluator recommends that the present survey supersede H10696 within the common area.

¹⁰ Concur

¹¹ Concur

¹² Concur. Generally, a comparison with the LIDAR sounding information reflects good agreement within the common area of H11065.

¹³ Concur- In addition, an approximate mean high water line has been shown on the smooth sheet in dashed red based on the sounding data and the hydrographer's findings from H11065 while conducting shoreline verification.

¹⁴ Concur. Final comparisons of junctional data and lidar information were made at the Pacific Hydrographic Branch and have been addressed during office processing.

¹⁵ Depth data in the areas discussed above was analyzed during office processing and found to compare satisfactorily with surrounding depths. The evaluator feels this data is adequate for application to the chart.

¹⁶ Tide Note dated January 9, 2002 is attached to this report

¹⁷ Filed with the hydrographic data.

¹⁸ Concur

¹⁹ Most of the charted information originates from prior surveys H4449 (1925), H4507 (1925) and H4509 (1925). A comparison of soundings reflects general differences of one fathom and there appears to be no consistent trend of shoaling or deepening within the common areas. Differences are likely due to present day data acquisition techniques and more thorough bottom coverage. The hydrographer has provided additional information in section D.2, Chart Comparison. The evaluator recommends that prior survey information be supersede by the present survey within the common area.

²⁰ Attached to this report.

²¹ Concur

²² Concur

²³ All shoreline shown on H11065 is in dashed red based on the final LIDAR sounding data from H11064 and subsequent shoreline verification conducted by the hydrographer on H11065.

²⁴ Submitted separately to the Pacific Hydrographic Branch as part of H11064

²⁵ Copy attached to this report.

²⁶ Filed with the hydrographic data.

²⁷ Filed with the hydrographic data.

²⁸ Concur

²⁹ Concur

³⁰ Concur

³¹ Concur

³² Shoreline verification conducted by the hydrographer has been analyzed during office processing and shown on the smooth sheet as warranted.

³³ Concur

³⁴ Concur

³⁵ Concur. Refer to the hydrographer's findings and discussion of features originating from the preliminary LIDAR data.

³⁶ Concur

³⁷ Concur

³⁸ Concur. The mean high water line has been shown on the smooth sheet in dashed red (approximate) based on the hydrographer's findings.

³⁹ Concur

⁴⁰ Do not concur. The final LIDAR data (H11064) submitted by the contractor does not show this rock at the geographic position listed in the report and has not been shown on the smooth sheet. Based on the final LIDAR data, and in accordance with the hydrographer's recommendation, endnote 36, the evaluator recommends charting this area as based on the smooth sheet.

⁴¹ Do not concur. The final LIDAR data submitted by the contractor does not show any of the thirteen rocks at the geographic positions listed in the report. Based on the final LIDAR data and in accordance with the hydrographer's recommendation, endnote 36, the evaluator has not shown these features on the smooth sheet. The evaluator recommends charting these areas as based on the smooth sheet.

⁴² Concur

⁴³ The final LIDAR data submitted by the contractor does not show any of the rocks at the geographic positions listed in the report and have not been shown on the smooth sheet. In accordance with the hydrographer's recommendation, endnote 36, the evaluator recommends charting these areas as based on the smooth sheet.

⁴⁴ Do not concur. The final LIDAR data submitted by the contractor does not show the rocks at the geographic positions listed in the report and have not been shown on the smooth sheet. In accordance with the hydrographer's recommendation, endnote 36, the evaluator recommends charting these areas as based on the smooth sheet.

⁴⁵ Concur

⁴⁶ Concur

⁴⁷ Concur

⁴⁸ Concur

⁴⁹ Concur

⁵⁰ Copy attached to this report.

⁵¹ Concur

⁵² Concur

⁵³ The evaluator recommends that the Hydrographic Surveys Division investigate how LIDAR data from the contractor can be incorporated into a final shoreline source.

⁵⁴ Revise to B.2

⁵⁵ Lidar data has been analyzed during office processing and shown on the smooth sheet as warranted.

⁵⁶ Concur

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H11065

Survey Title: State: Alaska
Locality: Southwest Alaska Peninsula
Sub-locality: SE Coast of Nakchamik Island to Atkulik Island

Project Number: OPR-P182-RA-01

Survey Dates: July 21 - August 7, 2001

Depths are reduced to Mean Lower Low Water using observed tides.
Positions are based on the NAD83 horizontal datum.

**ADVANCE
INFORMATION**

CHARTS AFFECTED:

<u>Chart</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
16566	1:77,477	10 th	February 20, 1999

DANGERS:

<u>Feature</u>	<u>Depth (fathoms)</u>	<u>Latitude</u>	<u>Longitude</u>
Sounding	7½	56°16'38.468"N	157°45'10.479"W
Sounding	9	56°18'38.578"N	157°49'04.108"W

COMMENTS:

Questions concerning this report should be directed to the Commanding Officer, NOAA Ship RAINIER, at (206) 553-4794 (inport November through mid-March), 1-(877) 665-6533 (at sea mid-March through November), or by e-mail at co.rainier@noaa.gov.

**ADVANCE
INFORMATION**

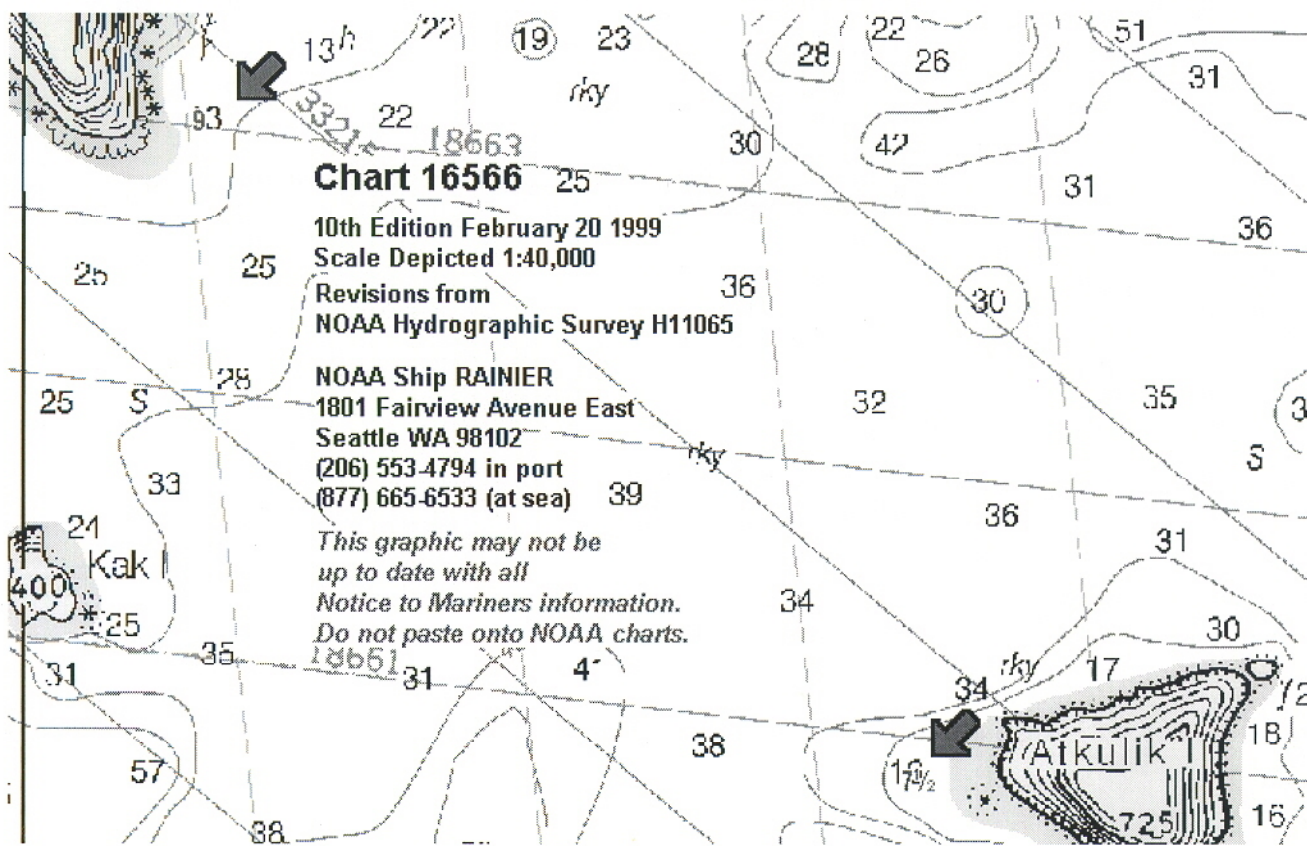


Chart 16566

10th Edition February 20 1999
Scale Depicted 1:40,000

Revisions from
NOAA Hydrographic Survey H11065

NOAA Ship RAINIER
1801 Fairview Avenue East
Seattle WA 98102
(206) 553-4794 in port
(877) 665-6533 (at sea)

*This graphic may not be
up to date with all
Notice to Mariners information.
Do not paste onto NOAA charts.*



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: January 9, 2002

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P182-RA-2001
HYDROGRAPHIC SHEET: H11065

LOCALITY: Southwest Alaska Peninsula, AK
TIME PERIOD: July 21 - August 7, 2001

TIDE STATION USED: 945-8849 Chankliut Island, AK
Lat. 56° 08.7'N Lon. 158° 06.8'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.367 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SWA116.

Refer to attachments for zoning information.

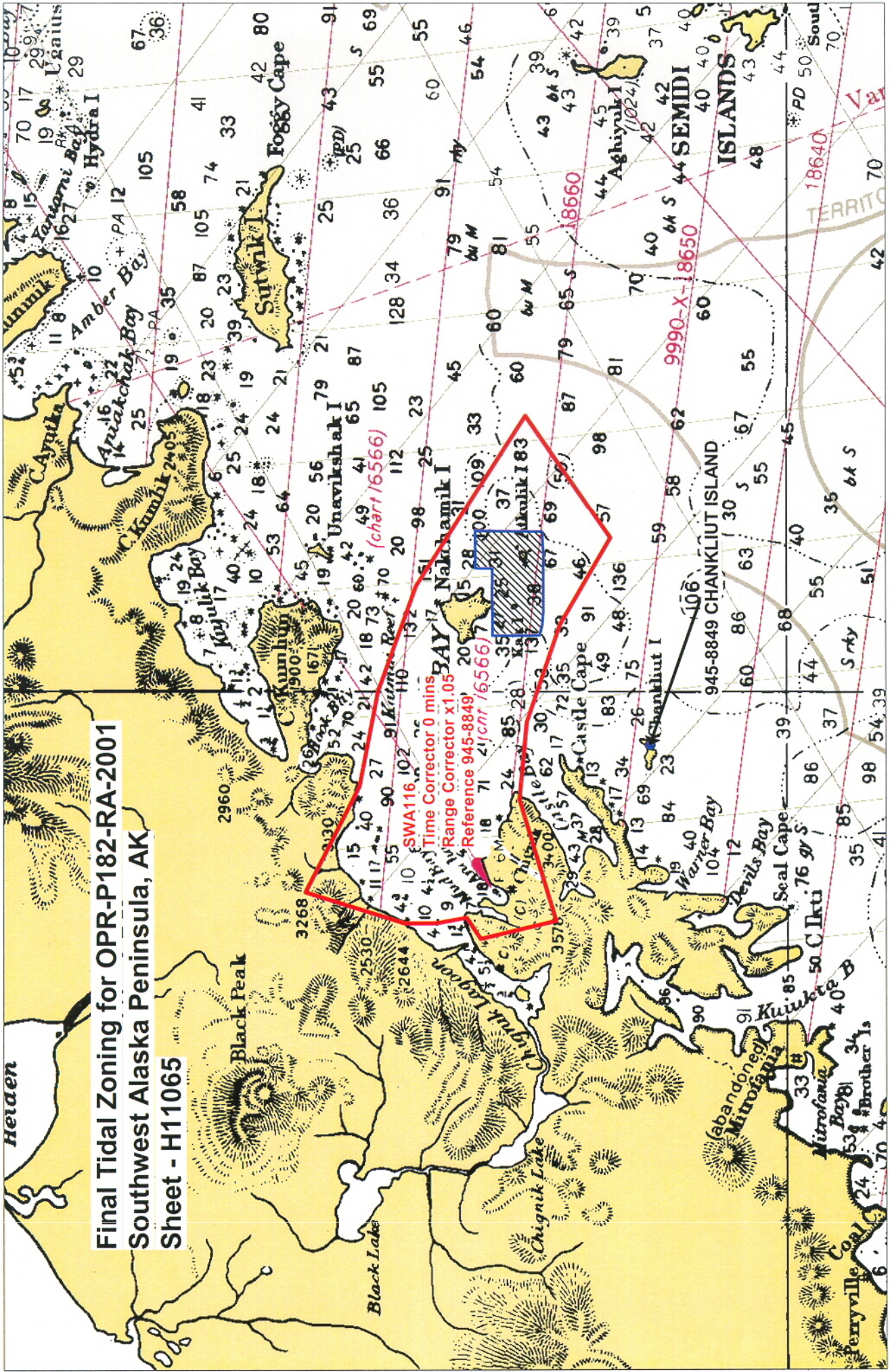
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

Thomas V. Yess 1/10/02

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Final Tidal Zoning for OPR-P182-RA-2001
Southwest Alaska Peninsula, AK
Sheet - H11065



Final tide zone node point locations for **OPR-P182-RA-2001,**
Sheet H11065.

Format: Tide Station (in recommended order of use)
 Average Time Correction (in minutes)
 Range Correction
 Longitude in decimal degrees (negative value denotes
 Longitude West),
 Latitude in decimal degrees

	Tide Station Order	AVG Time Correction	Range Correction
Zone SWA116			
-157.463905 56.279948	945-8849	0	1.05
-157.611337 56.332309			
-157.797065 56.397724			
-158.001591 56.438608			
-158.185932 56.458642			
-158.390942 56.516782			
-158.451602 56.410008			
-158.451315 56.376112			
-158.44083 56.343794			
-158.482054 56.328704			
-158.447246 56.247319			
-158.21176 56.28666			
-158.061374 56.278696			
-157.872073 56.242919			
-157.70266 56.188715			
-157.463905 56.279948			



Tenix™

NOAA Ship RAINIER
Attention:
LT EJ Van Den Aneelee

For Information:
Mr Bob Richards
Thales Geosolutions

Tenix LADS Corporation Pty Ltd

ACN 067 368 192
Second Avenue
Technology Park
Mawson Lakes SA 5095
Australia

Telephone +61 8 8300 4447
Facsimile +61 8 8349 7528

15 July 2001

INTERIM LADS DATA - 4

Dear EJ,

1. Interim LADS data over areas within Sheet Y is provided as requested. The data covers Atkulik, Kak and the south part of Nakchamik Island.
2. The data over Atkulik and Kak Islands has been validated and checked. It is suitable for survey planning and further data collection. Main line sounding has been conducted at 4x4-meter laser spot spacing (200% coverage). A number of soundings require further examination; a preliminary list is forwarded in the Appendix A.
3. Nakchamik Island. The data over the south part of Nakchamik Island has been validated but not checked and may still contain noise. It is suitable for general survey planning purposes only, but not for conducting examinations of features. Main line sounding has been conducted at 4x4-meter laser spot spacing (200% coverage). It is intended to reissue the Nakchamik Island data later this week when it has been checked.
4. Positions are on the UTM Zone 4. Depths are in meters, reduced to survey datum using predicted tides as described in the NOAA Statement of Work.
5. The data needs to be interpreted carefully. The shoreline has been surveyed however a maximum elevation of 11 meters has been recorded by the system, so the internal island areas will appear as gaps inside the coast. In some inshore areas kelp beds and white water have attenuated the laser pulses. These will appear as No Bottom Determined (NBD) and will appear as apparent gaps in the data along the shoreline. Where kelp, white water noise or high turbidity have been detected by the system NBA 0 has been assigned. In deeper water where the seabed has not been detected, NBA 5 or 10 meters has been assigned. It should be noted that for clarity NBA depths have been excluded from the hardcopy plots.
6. The following files are provided:

- a. Output S3 data (.OPD) suitable for importing into Caris HDCS
- b. ASCII E,N,Depth for all soundings (PTS) but not including No Bottom At (NBA) or No Bottom Determined (NBD) depths
- c. Image files (.TIF) and geo-reference files (.TFW)

Regards,



Mark Sinclair
Manager, Survey
Tenix LADS Corporation

Appendix:

- A. Soundings requiring examination - preliminary list

Attachments:

- 1. Interim digital data for Kak and Atkulik I (CD 5)
- 2. Interim digital data for Nakchamik I (CD 6)
- 3. Hardcopy plots of soundings, contours and image of the islands (Y - Atkulik, Y - Kak and Y - Nakchamik)

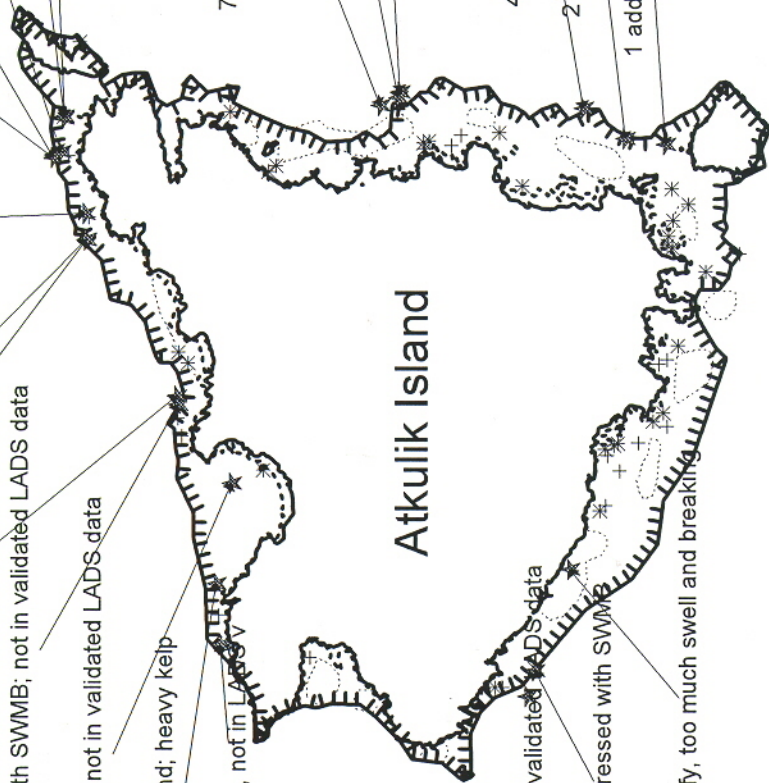
Appendix A - Soundings Requiring Examination - Preliminary List

The following soundings may be LADS noise returns (ie kelp or fish) but are considered worthy of examination in order to positively confirm or disprove them. This could be conducted by surface vessel (or LADS at 2x2 or 3x3 meter laser spot spacing).

#	depth	line #	F/R/C	E,N	Remarks
1.	2.1	800.0.1	118/16/38	578 894, 6 237 162	in 10m
2.	-0.2	801.0.1	27/14/10	578 906, 6 237 246	on slope from 7-20m
3.	-0.2	802.0.1	102/6/46	577 802, 6 237 433	in 17m
4.	1.8	802.0.1	118/5/42	578 968, 6 237 332	in 11m
5.	-1.7	802.0.1	105/4/31	578 014, 6 237 360	in 9 m close to coast
6.	3.1	804.0.1	101/15/8	577 749, 6 237 449	2.6 adjacent
7.	1.5	807.0.1	27/15/1	578 973, 6 237 753	in 10m
8.	4.0	807.0.1	27/10/11	578 989, 6 237 716	in 15m
9.	4.8	807.0.1	27/7/12	579 001, 6 237 712	in 17m; others 10 - 30m NW
10.	1.8	811.0.1	41/5/14	577 983, 6 238 094	in 3.5; kelp on shoal
11.	2.6	812.0.1	35/10/8	578 372, 6 238 176	in 10m
12.	2.5	812.0.1	35/14/9	578 355, 6 238 174	in approx 10m
13.	1.9	812.0.1	42/9/39	577 856, 6 238 086	1.9 in 4m close to coast
14.	2.6	812.0.1	37/16/14	578 191, 6 238 062	on slope 7 - 12 m
15.	2.7	815.0.4	116/9/41	572 540, 6 238 686	in 10 - 12 m
16.	3.1	815.0.4	31/5/13	578 695, 6 238 364	and 2.1 close E in 13 m
17.	1.8	816.0.4	28/12/18	578 945, 6 238 410	in 12m
18.	1.4	816.0.4	29/1/33	578 865, 6 238 433	on slope 10 - 20 m
19.	1.0	816.0.4	29/11/17	578 877, 6 238 417	in 10m
20.	1.9	816.0.4	31/6/32	578 750, 6 238 367	in 10m
21.	2.4	816.0.4	32/1/33	578 697, 6 238 364	on slope 8 - 20 m
22.	1.4	817.0.2	29/1/33	578 865, 6 238 433	on slope 10 - 20m
23.	0.1	817.0.2	27/16/37	578 949, 6 238 411	in 10m

- 11 addressed with SWMB; not in validated LADS data
- 20 addressed (disproved?) with single-beam & SWMB; heavy ke
- 21 disproved (?) with single-beam & SWMB; heavy ke
- 16 disproved (?) with single-beam & SWMB; heavy ke
- 22 addressed w/SWMB; not in validated LADS data (18 disproved with SWMB; not in validated (22?))
- 19 addressed with SWMB, hol10m; not in validated LA
- 17 kelp, unable to address, rk 10m away disprvd w/
- 23 kelp, unable to address, rk 10m away disprvd w/
- 12 addressed with SWMB; not in validated LADS data
- 14 addressed with SWMB, not in validated LADS data
- 10 addressed w/SB, no rock found; heavy kelp
- 13 addressed with SWMB(hol4m), kelp, not in validated LADS data
- 7 addressed with SWMB; not in validated LADS data
- 8 addressed with SWMB; not in validated LADS data
- 9 addressed with SWMB; not in validated LADS data
- 6 addressed with SWMB, not in validated LADS data
- 3 disproved (SB?), addressed with SWMB
- 4 disproved with single-beam, SWMB dev planned
- 2 addressed with SWMB; not in validated LADS data
- 1 addressed w/ SWMB; 3.4 nearby, too much swell
- 5 too close to verify, too much swell and breaking

Atkulik Island





15 not in validated LADS dataset, hol w/in 5m, dev

Kak I.

NOAA Ship RAINIER
Attention:
LT EJ Van Den Aneele

For Information:
Mr Bob Richards
Thales Geosolutions

Tenix LADS Corporation Pty Ltd

ACN 067 368 192
Second Avenue
Technology Park
Mawson Lakes SA 5095
Australia

Telephone +61 8 8300 4447
Facsimile +61 8 8349 7528

22 July 2001

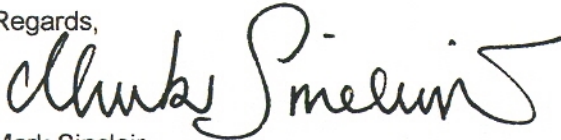
INTERIM LADS DATA - 5

Dear EJ,

1. Interim LADS data over areas within Sheet Y is provided as requested. The data covers the southern part of Nakchamik Island and replaces the Nakchamik Island data previously provided under Interim LADS Data - 4.
2. The Nakchamik Island data has been validated and checked. It is suitable for survey planning and further data collection. Main line sounding has been conducted at 4x4-meter laser spot spacing (200% coverage). A number of soundings require further examination; a preliminary list is forwarded in the Appendix A.
3. The southern peak of Nakchamik Island is considerably higher than the 1320 feet on NOAA chart 16566 (10th Ed., Feb 20/99). This was discovered whilst conducting the first two lines off the southern tip of the island (lines 414 and 415). The survey area was subsequently replanned from an east-west orientation into two separate sub-areas orientated north-west (lines 1308 to 1318) and north-east (lines 1403 to 1423).
4. Turbulence was experienced close to the eastern side of Nakchamik Island which has resulted in a slightly irregular scan pattern (lines 1403 and 1404). It is intended to re-fly these lines should more suitable flying conditions be experienced.
5. Positions are on the UTM Zone 4. Depths are in meters, reduced to survey datum using predicted tides using the tidal model as described in the NOAA Statement of Work.
6. The data needs to be interpreted carefully as follows:
 - a. The shoreline has been surveyed however a maximum topographic elevation of 11 meters has been recorded by the system, so the internal island areas appear as gaps inside the coast.
 - b. In some inshore areas kelp beds and white water have attenuated the laser pulses. These will appear as No Bottom Determined (NBD) and will appear as apparent gaps in the data along the shoreline. This occurred along the east side of Nakchamik Island due to kelp. These areas are evident on the hardcopy image where no depths are portrayed.

- c. Where kelp, white water noise or high turbidity have been detected by the system NBA 0 has been assigned. Turbid water was experienced inside the 5 meter contour close inshore on the northern part of the bay on the east side of the island and in an isolated area off the headland on the western side.
 - d. In deeper water where the seabed has not been detected, NBA 5 or 10 meters has been assigned.
 - e. It should be noted that for clarity NBA depths have been excluded from the hardcopy plots.
7. The following files are provided:
- a. Output S3 data (NAK3_2.OPD) suitable for importing into Caris HDCS
 - b. ASCII E,N,Depth for all soundings (NAK_2.PTS) but not including No Bottom At (NBA) or No Bottom Determined (NBD) depths
 - c. Image file (NAK_2.TIF) and geo-reference files (NAK_2.TFW)

Regards,



Mark Sinclair
Manager, Survey
Tenix LADS Corporation

Appendix:

- A. Soundings requiring examination - Preliminary List 2

Attachments:

- 1. Interim digital data for Nakchamik I (CD 7)
- 2. Hardcopy plots of soundings, contours and image of the islands (Y - Nakchamik)
- 3. Digital copy of Soundings Requiring Examination

Appendix A - Soundings Requiring Examination - Preliminary List 2

The following soundings are considered worthy of examination in order to positively confirm or disprove them. This could be conducted by surface vessel (or LADS at 2x2 or 3x3 meter laser spot spacing).

West side of Nakchamik Island

Point No.	Depth	Line No.	F/R/C	Easting	Northing	Remarks
1	-1.0	1315.0.1	101/11/7	571 014	6 241 879	possible kelp on shoal
2	1.1	1315.0.1	103/7/21	570 878	6 241 897	possible kelp on shoal in 14m
3	4.8	1315.0.1	103/13/9	570 881	6 241 950	in 10m
4	1.7	1316.0.1	74/5/6	572 629	6 241 008	possible kelp close to coast - see #8
5	0.7	1316.0.1	80/18/5	572 228	6 241 257	possible kelp
6	7.0	1316.0.1	95/5/8	571 344	6 241 765	in 10m
7	1.8	1316.0.1	101/16/34	570 894	6 241 923	possible kelp
8	1.8	1317.0.1	72/8/27	572 630	6 241 007	see #4
9	NBA0	1317.0.1	82/5/33	572 012	6 241 345	possible kelp
10	NBA0	1317.0.1	83/11/25	571 945	6 241 421	possible kelp
11	2.2	1317.0.1	85/17/18	571 815	6 241 531	possible kelp in approx 17m - see #13
12	1.5	1317.0.1	88/8/11	571 677	6 241 647	in approx 15m - see #14
13	1.6	1318.0.1	86/15/39	571 815	6 241 530	in approx 15m, agrees with pt. #11
14	2.6	1318.0.1	89/6/32	571 676	6 241 648	in 12m - see #12
15	3.0	1317.0.1	90/4/4	571 582	6 241 736	in 9m
16	2.9	1317.0.1	92/1/20	571 440	6 241 748	in approx 10m
17	2.6	1318.0.1	70/16/8	572 836	6 241 068	in approx 10m
18	6.4	1318.0.1	71/1/15	572 811	6 241 048	possible kelp in approx 10m
19	5.4	1318.0.1	71/10/4	572 803	6 241 105	possible kelp in approx 10m
20	4.9	1318.0.1	71/15/6	572 781	6 241 106	possible kelp in approx 10m
21	3.8	1318.0.1	71/16/16	572 761	6 241 077	possible kelp in approx 10m
22	3.4	1318.0.1	88/18/19	571 722	6 241 682	shoaler depths N
23	-3.1	1318.0.1	91/14/17	571 553	6 241 791	possible drying rock or white water
24	7.0	1318.0.1	90/14/43	571 565	6 241 664	in 13m
25	2.9	1318.0.1	92/14/43	571 439	6 241 739	in 10m, 2.9m 10m N
26	0.7	1318.0.1	106/18/16	570 582	6 242 376	in 10m
27	1.8	1318.0.1	107/1/5	570 598	6 242 411	in 10m

**East side of Nakchamik
Island**

Point No.	Depth	Line No.	F/R/C	Easting	Northing	Remarks
1	1.7	1403.0.1	73/14/39	572 630	6 241 008	in approx 10m
2	4.3	1404.0.1	74/11/30	572 763	6 241 063	in approx 10m
3	3.4	1404.0.1	74/14/14	572 833	6 241 070	in approx 5m
4	NBA0	1405.0.1	76/7/10	572 955	6 241 218	in approx 12m
5	4.0	1405.0.1	75/4/14	572 924	6 241 134	in 11m, 3.3 10m SE - see #6
6	3.3	1406.0.1	75/12/31	572 931	6 241 125	in 11m - see #5
7	1.9	1406.0.1	77/17/1	573 083	6 241 271	in NBA 10, 3.9m close SW
8	5.3	1406.0.1	78/5/33	572 967	6 241 305	in area of sparse depths 5-6m
9	4.1	1406.0.1	78/6/21	573 015	6 241 306	in NBA 10 - see #10
10	3.8	1407.0.1	78/9/39	573 015	6 241 306	see #9
11	1.7	1408.0.1	93/2/29	573 359	6 242 246	in 11m - see #12
12	1.9	1407.0.1	91/16/9	573 360	6 242 246	see #11
13	4.5	1409.0.1	93/13/39	573 421	6 242 343	possible kelp on ridge
14	NBA0	1409.0.1	94/4/16	573 522	6 242 367	possible kelp on ridge - see #15
15	NBA0	1410.0.2	90/16/37	573 520	6 242 368	see #14
16	5.1	1413.0.1	92/9/46	573 745	6 242 423	possible kelp in 10m
17	-1.8	1415.0.1	95/10/2	574 118	6 242 552	possible drying rock or white water
18	1.1	1417.0.1	90/18/13	574 193	6 242 371	in 12m
19	2.4	1419.0.1	104/4/47	574 424	6 243 219	on slope close to coast
20	9.5	1423.0.1	99/18/4	574 843	6 242 873	in NBA 10

ID	Depth	Line	F_R_C	Easting	Northing	Remarks	Investigation_Results
1	-1	1315.0.1	101/11/7	571,014	6,241,879	possible kelp on shoal	1W beyond sheet limits (prior survey)
2	1.1	1315.0.1	103/7/21	570,878	6,241,897	possible kelp on shoal in 14m	2W beyond sheet limits (prior survey)
3	4.8	1315.0.1	103/13/9	570,881	6,241,950	in 10m	3W beyond sheet limits (prior survey)
4	1.7	1316.0.1	74/5/6	572,629	6,241,008	possible kelp close to coast - see #	4W heavy kelp
5	0.7	1316.0.1	80/18/5	572,228	6,241,257	possible kelp	5W kelp, unable to approach, breakers
6	7	1316.0.1	95/5/8	571,344	6,241,765	in 10m	6W beyond sheet limits (prior survey)
7	1.8	1316.0.1	101/16/34	570,894	6,241,923	possible kelp	7W beyond sheet limits (prior survey)
8	1.8	1317.0.1	72/8/27	572,630	6,241,007	see #4	8W heavy kelp
9	NBA0	1317.0.1	82/5/33	572,012	6,241,345	possible kelp	9W kelp
10	NBA0	1317.0.1	83/11/25	571,945	6,241,421	possible kelp	10W kelp
11	2.2	1317.0.1	85/17/18	571,815	6,241,531	possible kelp in approx 17m - see #	11W nothing seen, limit of kelp foul are
12	1.5	1317.0.1	88/8/11	571,677	6,241,647	in approx 15m - see #14	12W heavy kelp
13	1.6	1318.0.1	86/15/39	571,815	6,241,530	in approx 15m, agrees with pt. #11	13W nothing seen, limit of kelp foul are
14	2.6	1318.0.1	89/6/32	571,676	6,241,648	in 12m - see #12	14W heavy kelp
15	3	1317.0.1	90/4/4	571,582	6,241,736	in 9m	15W kelp, unable to approach, breakers
16	2.9	1317.0.1	92/1/20	571,440	6,241,748	in approx 10m	16W kelp, unable to approach
17	2.6	1318.0.1	70/16/8	572,836	6,241,068	in approx 10m	17W kelp, unable to approach
18	6.4	1318.0.1	71/1/15	572,811	6,241,048	possible kelp in approx 10m	18W kelp, 4m SB nearby
19	5.4	1318.0.1	71/10/4	572,803	6,241,105	possible kelp in approx 10m	19W kelp, unable to approach
20	4.9	1318.0.1	71/15/6	572,781	6,241,106	possible kelp in approx 10m	20W kelp, unable to approach
21	3.8	1318.0.1	71/16/16	572,761	6,241,077	possible kelp in approx 10m	21W kelp, unable to approach
22	3.4	1318.0.1	88/18/19	571,722	6,241,682	shoaler depths N	22W kelp, unable to approach, breakers
23	-3.1	1318.0.1	91/14/17	571,553	6,241,791	possible drying rock or white water	23W kelp, unable to approach, breakers
24	7	1318.0.1	90/14/43	571,565	6,241,664	in 13m	24W kelp, unable to approach
25	2.9	1318.0.1	92/14/43	571,439	6,241,739	in 10m, 2.9m 10m N	25W kelp, unable to approach
26	0.7	1318.0.1	106/18/16	570,582	6,242,376	in 10m	26W beyond sheet limits (prior survey)
27	1.8	1318.0.1	107/1/5	570,598	6,242,411	in 10m	27W beyond sheet limits (prior survey)
0				0	0		Nakchamik West

ID	Depth	Line	F_R_C	Easting	Northing	Remarks	Investigation_Results
1	1.7	1403.0.1	73/14/39	572,630	6,241,008	in approx 10m	1E heavy kelp, unable to approach
2	4.3	1404.0.1	74/11/30	572,763	6,241,063	in approx 10m	2E heavy kelp, unable to approach
3	3.4	1404.0.1	74/14/14	572,833	6,241,070	in approx 5m	3E heavy kelp, unable to approach
4	NBA0	1405.0.1	76/7/10	572,955	6,241,218	in approx 12m	4E heavy kelp (DP 50231)
5	4	1405.0.1	75/4/14	572,924	6,241,134	in 11m, 3.3 10m SE - see #6	5E heavy kelp, 3.4m SB (DP 50234)
6	3.3	1406.0.1	75/12/31	572,931	6,241,125	in 11m - see #5	6E heavy kelp, 3.4m SB (DP 50234)
7	1.9	1406.0.1	77/17/1	573,083	6,241,271	in NBA 10, 3.9m close SW	7E nothing seen, SB 11m
8	5.3	1406.0.1	78/5/33	572,967	6,241,305	in area of sparse depths 5-6m	8E heavy kelp, unable to approach
9	4.1	1406.0.1	78/6/21	573,015	6,241,306	in NBA 10 - see #10	9E kelp just under surface
10	3.8	1407.0.1	78/9/39	573,015	6,241,306	see #9	10E kelp just under surface
11	1.7	1408.0.1	93/2/29	573,359	6,242,246	in 11m - see #12	11E beyond sheet limits (prior survey)
12	1.9	1407.0.1	91/16/9	573,360	6,242,246	see #11	12E beyond sheet limits (prior survey)
13	4.5	1409.0.1	93/13/39	573,421	6,242,343	possible kelp on ridge	13E beyond sheet limits (prior survey)
14	NBA0	1409.0.1	94/4/16	573,522	6,242,367	possible kelp on ridge - see #15	14E beyond sheet limits (prior survey)
15	NBA0	1410.0.2	90/16/37	573,520	6,242,368	see #14	15E beyond sheet limits (prior survey)
16	5.1	1413.0.1	92/9/46	573,745	6,242,423	possible kelp in 10m	16E beyond sheet limits (prior survey)
17	-1.8	1415.0.1	95/10/2	574,118	6,242,552	possible drying rock or white wate	17E beyond sheet limits (prior survey)
18	1.1	1417.0.1	90/18/13	574,193	6,242,371	in 12m	18E beyond sheet limits (prior survey)
19	2.4	1419.0.1	104/4/47	574,424	6,243,219	on slope close to coast	19E beyond sheet limits (prior survey)
20	9.5	1423.0.1	99/18/4	574,843	6,242,873	in NBA 10	20E beyond sheet limits (prior survey)
0				0	0		Nakchamik East

Sounding #	Depth	Line #	F	R	C	Easting	Northing	Remarks
1	2.1	800.0.1	118	16	38	578894	6237162	in 10m
2	-0.2	801.0.1	27	14	10	578906	6237246	on slope from 7-20m
3	-0.2	802.0.1	102	6	46	577802	6237433	in 17m
4	1.8	802.0.1	118	5	42	578968	6237332	in 11m
5	-1.7	802.0.1	105	4	31	578014	6237360	in 9m close to coast
6	3.1	804.0.1	101	15	8	577749	6237449	2.6 adjacent
7	1.5	807.0.1	27	15	1	578973	6237753	in 10m
8	4	807.0.1	27	10	11	578989	6237716	in 15m
9	4.8	807.0.1	27	7	12	579001	6237712	in 17m; others 10-30m NW
10	1.8	811.0.1	41	5	14	577983	6238094	in 3.5m; kelp on shoal
11	2.6	812.0.1	35	10	8	578372	6238176	in 10m
12	2.5	812.0.1	35	14	9	578355	6238174	in approx 10m
13	1.9	812.0.1	42	9	39	577856	6238086	1.9 in 4m close to coast
14	2.6	812.0.1	37	16	14	578191	6238062	on slope from 7-12m
15	2.7	815.0.4	116	9	41	572540	6238686	in 10-12m
16	3.1	815.0.4	31	5	13	578695	6238364	and 2.1 close E in 13m
17	1.8	816.0.4	28	12	18	578945	6238410	in 12m
18	1.4	816.0.4	29	1	33	578865	6238433	on slope from 10-20m
19	1	816.0.4	29	11	17	578877	6238417	in 10m
20	1.9	816.0.4	31	6	32	578750	6238367	in 10m
21	2.4	816.0.4	32	1	33	578697	6238364	on slope from 8-20m
22	1.4	817.0.2	29	1	33	578865	6238433	on slope from 10-20m
23	0.1	817.0.2	27	16	37	578949	6238411	in 10m

preliminary RAINIER

sounding (60m grid)	center of shoal-biased 50m grid	remarks
8.2m	56-16-22.12N	157-43-34.8W
8.8m	56-16-24.54N	157-43-33.96W
9.8m	56-16-30.95N	157-44-34.74W
15.4m	56-16-27.53N	157-43-28.46W
no data		nothing seen visually
4.2m	56-16-31.94N	157-44-39.9W
9.3m	56-16-40.09N	157-43-29.07W
18.6m	56-16-39.47N	157-43-26.17W
18.6m	56-16-39.47N	157-43-26.17W (same grid as #8)
5.7m	56-16-52.36N	157-44-26.23W
8.1m	56-16-54.97N	157-44-01.27W
8.3m	56-16-54.4N	157-44-04.7W
6.1m	56-16-52.17N	157-44-32.95W
4.7m	56-16-51.52N	157-44-11.43W
8.5m	56-17-15.25N	157-49-42.75W
6.4m	56-16-59.92N	157-43-44.58W
12.8m	56-17-02.45N	157-43-29.16W
6.9m	56-17-02.11N	157-43-32.92W
6.9m	56-17-02.11N	157-43-32.92W (same grid as #18)
9.5m	56-17-00.95N	157-43-41.64W
6.4m	56-16-59.92N	157-43-44.58W (same grid as #16)
6.9m	56-17-02.11N	157-43-32.92W (same grid as #18)
12.8m	56-17-02.45N	157-43-29.16W (same grid as #17)

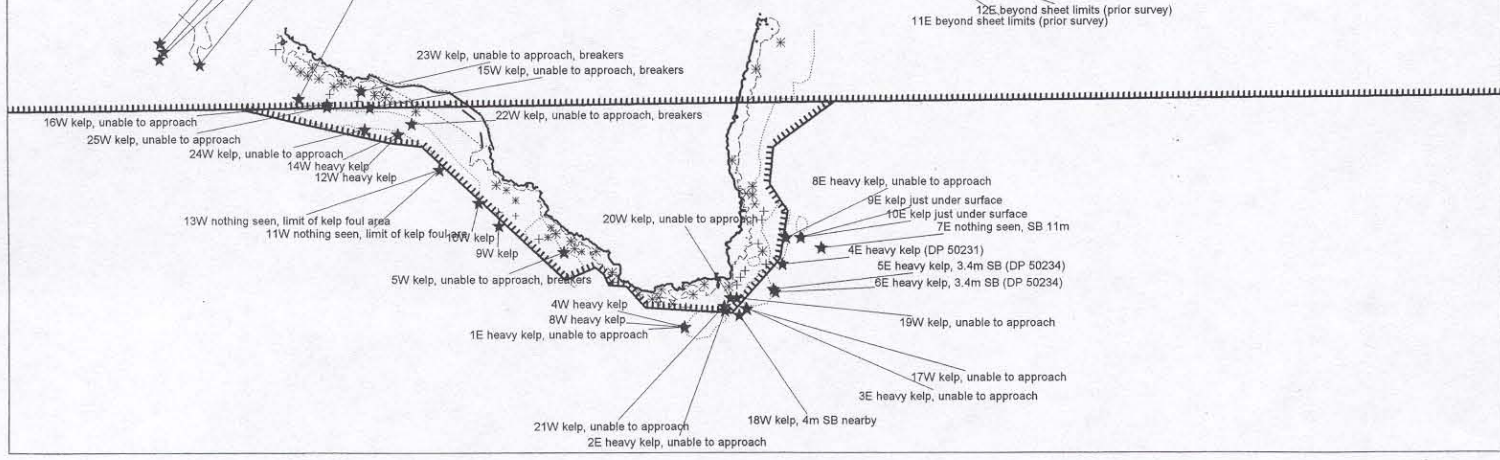
Sounding #	Lat/Long of LIDAR sounding
1	56-16-21.6 N 157-43-23.43 W
2	56-16-24.47 N 157-43-32.79 W
3	56-16-31.18 N 157-44-36.76 W
4	56-16-27.22 N 157-43-29.1 W
5	56-16-28.69 N 157-44-24.51 W
6	56-16-31.73 N 157-44-39.82 W
7	56-16-40.83 N 157-43-28.35 W
8	56-16-39.62 N 157-43-27.47 W
9	56-16-39.49 N 157-43-26.77 W
10	56-16-52.45 N 157-44-25.54 W
11	56-16-54.87 N 157-44-02.84 W
12	56-16-54.81 N 157-44-03.83 W
13	56-16-52.26 N 157-44-32.93 W
14	56-16-51.29 N 157-44-13.48 W
15	56-17-14.7 N 157-49-41.37 W
16	56-17-00.75 N 157-43-43.86 W
17	56-17-02.09 N 157-43-29.28 W
18	56-17-02.88 N 157-43-33.9 W
19	56-17-02.36 N 157-43-33.22 W
20	56-17-00.82 N 157-43-40.66 W
21	56-17-00.75 N 157-43-43.74 W
22	56-17-02.88 N 157-43-33.9 W
23	56-17-02.12 N 157-43-29.04 W

H11065 - S Nakchamik Island

- Approximate MHW Line - LIDAR (H11064)
- - - - Approximate MLLW Line - LIDAR (H11064)
- * LIDAR Rock (H11064)
- + LIDAR Submerged Rock (H11064)
- Potential Foul Areas - LIDAR (H11064)
- TS Shoreline segment
- ★ LIDAR sounding for examination
- ||||| H11065 Survey Limit

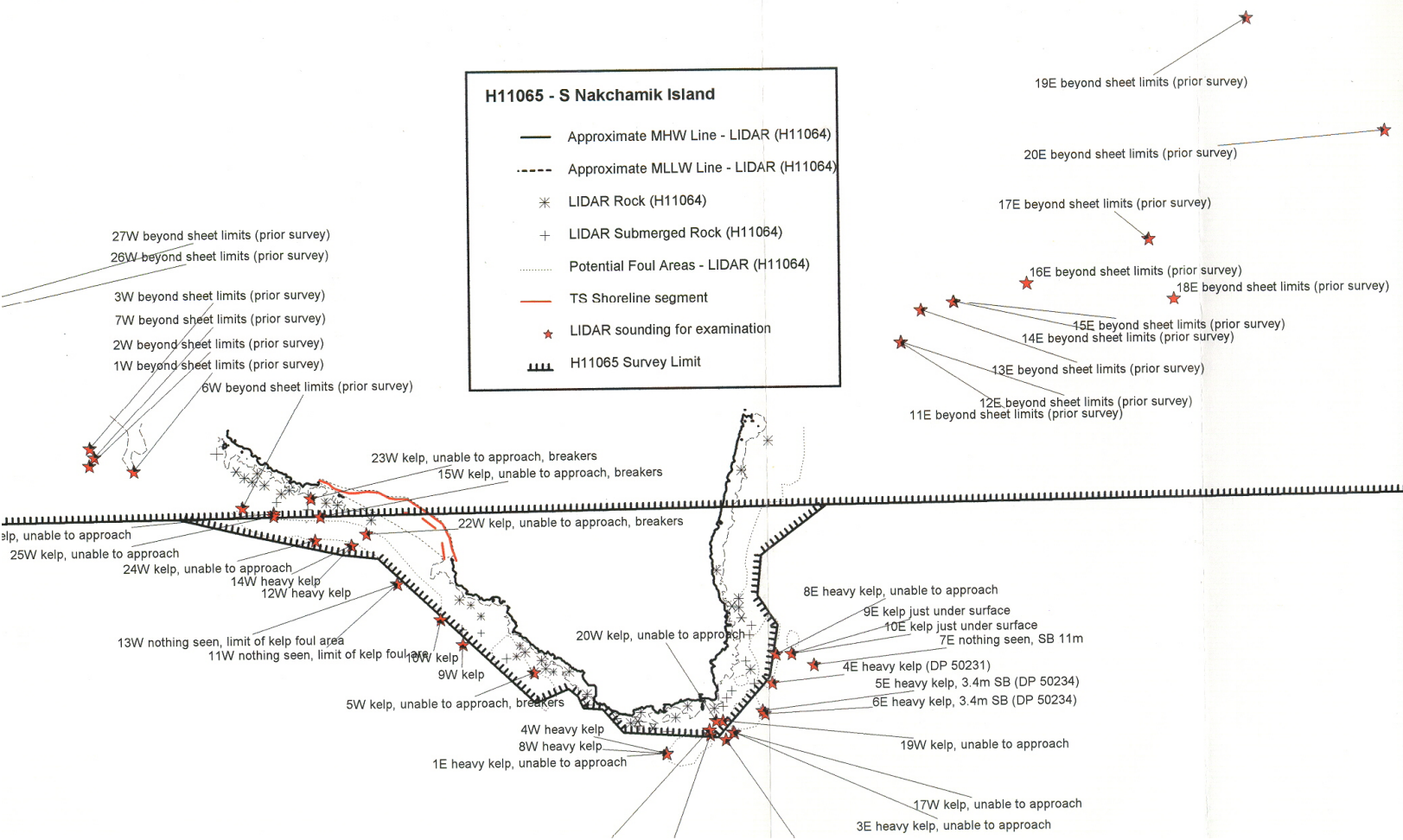
27W beyond sheet limits (prior survey)
 26W beyond sheet limits (prior survey)
 3W beyond sheet limits (prior survey)
 7W beyond sheet limits (prior survey)
 2W beyond sheet limits (prior survey)
 1W beyond sheet limits (prior survey)
 6W beyond sheet limits (prior survey)

19E beyond sheet limits (prior survey)
 20E beyond sheet limits (prior survey)
 17E beyond sheet limits (prior survey)
 18E beyond sheet limits (prior survey)
 18E beyond sheet limits (prior survey)
 15E beyond sheet limits (prior survey)
 14E beyond sheet limits (prior survey)
 13E beyond sheet limits (prior survey)
 12E beyond sheet limits (prior survey)
 11E beyond sheet limits (prior survey)



H11065 - S Nakchamik Island

- Approximate MHW Line - LIDAR (H11064)
- - - - Approximate MLLW Line - LIDAR (H11064)
- * LIDAR Rock (H11064)
- + LIDAR Submerged Rock (H11064)
- Potential Foul Areas - LIDAR (H11064)
- TS Shoreline segment
- ★ LIDAR sounding for examination
- ||||| H11065 Survey Limit



APPROVAL SHEET
H11065

Initial Approvals:

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

Gary C. Nelson Date: 2/4/2004
Gary Nelson
Chief, Cartographic Team
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Descriptive Report.

E. J. Van Den Ameerle Date: 4/13/2004
Edward J. Van Den Ameerle
LT, NOAA
Chief, Pacific Hydrographic Branch

AWOL / SURF
6/18/04
mcr

HYDROGRAPHIC SURVEY STATISTICS

H11065

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	NA
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	NA

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES					
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

SHORELINE DATA

SHORELINE MAPS (List):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List):

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
FINDINGS REVISED			
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET			173
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT			23
GEOGRAPHIC NAMES			
OTHER (Chart Compilation)			59
USE OTHER SIDE OF FORM FOR REMARKS	TOTALS		255

Pre-processing Examination by	Beginning Date	03/12/2002	Ending Date	
Verification of Field Data by Mayor, R. Davies, L. Deodato	Time (Hours)	173	Ending Date	
Verification Check by	Time (Hours)		Ending Date	
Evaluation and Analysis by L. Deodato	Time (Hours)	23	Ending Date	07/30/2002
Inspection by <i>B. Olmstead</i>	Time (Hours)	4	Ending Date	2/4/2004

