

H110662

NOAA FORM 76-36A

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

DESCRIPTIVE REPORT

Type of Survey . . . Hydrographic
Field No. PHP-5-3-95
Registry No. H-10662

LOCALITY

State Washington
General Locality . . . Possession Sound
Sublocality Port Gardner

19 95

CHIEF OF PARTY
R.A. Fletcher

LIBRARY & ARCHIVES

DATE April 3, 1997

DIAGRAM 6450-3

Charts



HYDROGRAPHIC TITLE SHEET

H-10662

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.

PHP-5-3-95

State Washington

General locality Posession Sound

Locality Port Gardner

Scale 1:5,000 Date of survey Nov 20, 1995 To Jan 30, 1996

Instructions dated July 6, 1995* Project No. OPR-N267-PHP

Vessel NOAA Launches 1101 (EDP#0651) and 1102 (EDP#0652)

Chief of party LT Richard A. Fletcher, NOAA

Surveyed by Pacific Hydrographic Party Personnel

Soundings taken by Side Scan DSF6000N and Innerspace 448
~~echo sounder, hand lead, pole~~ EG&G Model 260

Graphic record scaled by PHP Personnel

Graphic record checked by PHP Personnel

Evaluation by: B. Mihailov Automated plot by HP Design Jet 650C
~~Plotted by:~~

Verification by B. Mihailov

Soundings in ~~fathoms~~ feet at MLW MLLW

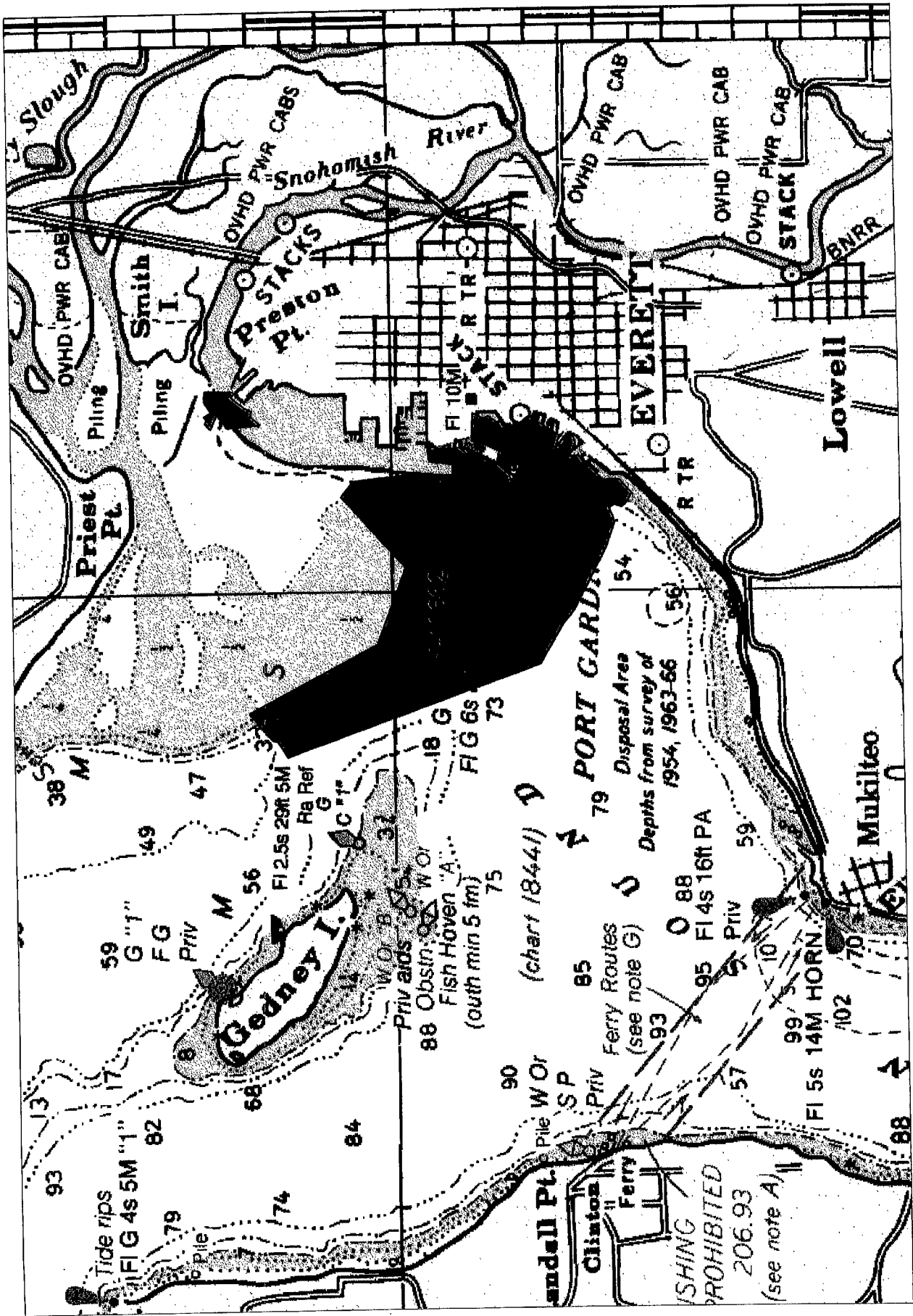
REMARKS: All times in UTC, revisions and marginal notes in black were
generated during office processing. All separates are filed
with the hydrographic data, as a result page numbering may be
interrupted or non-sequential.

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

SURE V & ANCHORS V BY LTJG Rick S. 3-24-97

*

Change No. 1 dated December 18, 1995

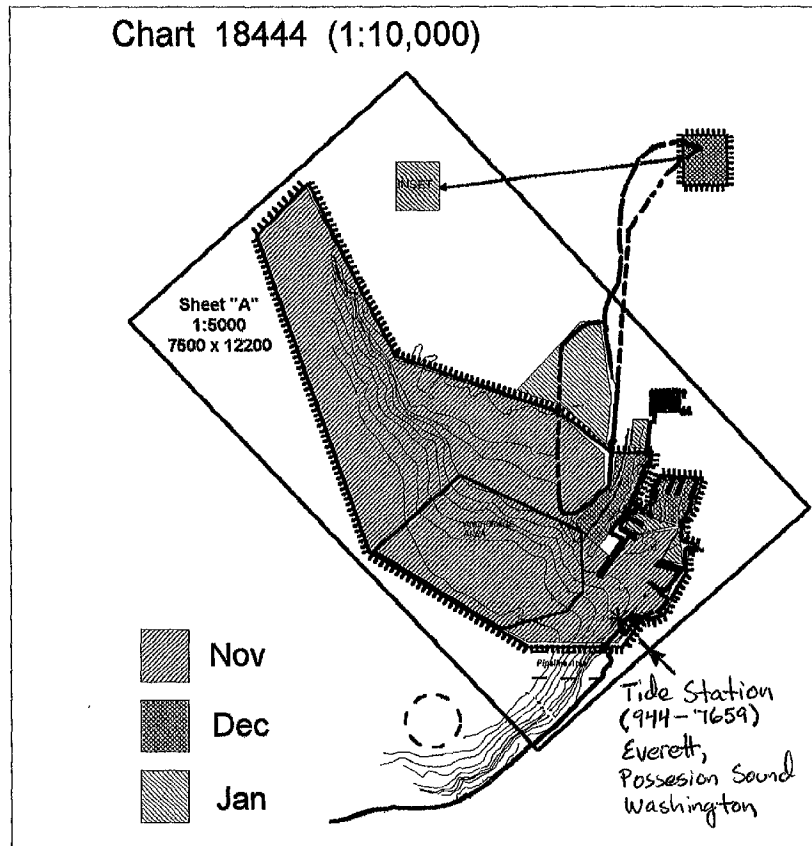


Pacific Hydrographic Party

LT Rick Fletcher, NOAA
Chief

OPR-267-PHP
Port of Everett, WA
H-10662

Progress Sketch
January



Progress

Started	Est. Completion	Completed	Submitted
11/20/1995	02/07/1996		

Downtime

Month	Weather	Mechanical	Electronics	Furlough
November	0	0	0	0
December	1	0	1	5
January	1	5	0	5

Type	November	December	January
LNM Hydro	94.6	70.1	31.6
LNM SSS	0.0	20.8	1.4
Sq. NM	3.0	1.0	0.3
DP	1.0	77.0	22.0
Dives	3.0	0.0	0.0
BS	0.0	0.0	13.0
SV casts	2.0	0.0	1.0
AWOIS	0.0	1.0	14.0
Control Stations	7.0	0.0	0.0

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-N267-PHP
PHP-5-3-95
H-10662

PACIFIC HYDROGRAPHIC PARTY
LT Richard A. Fletcher, NOAA
Chief of Party

A. PROJECT ✓✓

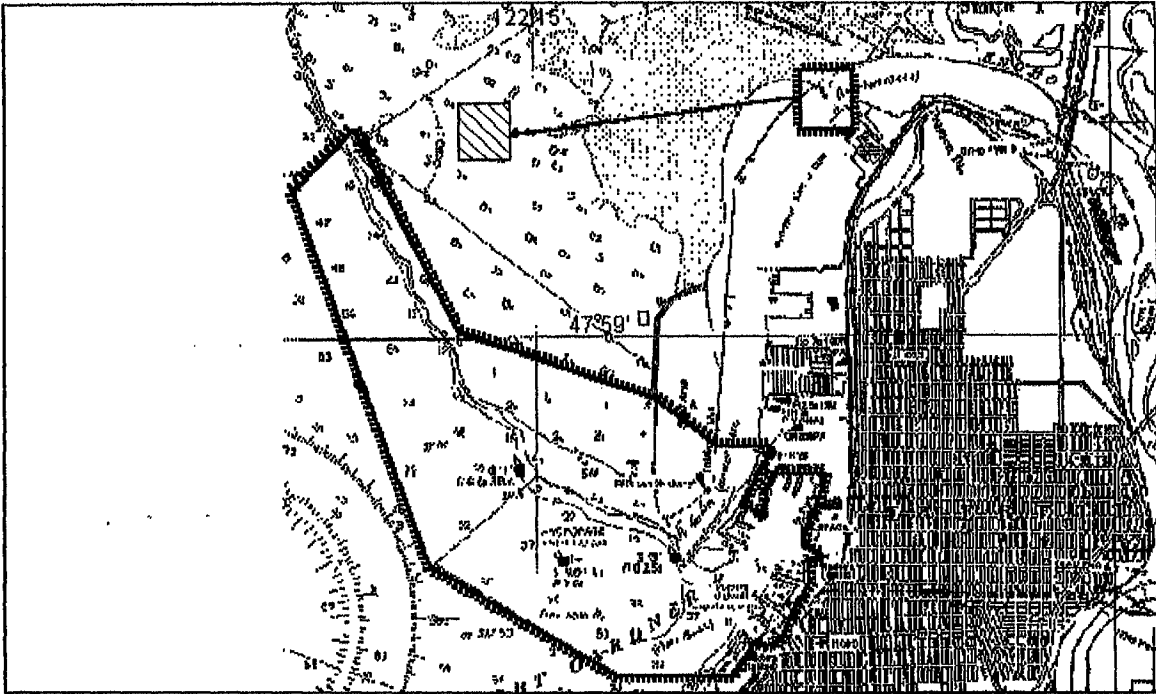
Project OPR-N267-PHP covers the areas known as Port Gardner, the East Waterway and the Snohomish River in Possession Sound. This survey is a basic hydrographic survey except as modified by the Project Instructions. The primary purpose of this survey is to locate and define any navigational obstructions in areas of concern to the Port of Everett and Naval Station Everett. The Port's configuration has been significantly altered by the U.S. Navy's Everett Home Port construction. The area was last surveyed in 1954.

Survey operations were conducted in accordance with Hydrographic Project Instructions OPR-N267-PHP, Port of Everett, Washington, dated July 16, 1995 and Change No. 1 to Hydrographic Project Instructions, dated December 18, 1995. Survey H-10662 is registered as a 1:5,000 survey.

The survey described in this report was designated Port Gardner, Possession Sound, Washington and assigned field sheet number PHP-5-3-95. The field sheet number was incorrectly reported as PHP-5-2-95 when the registry number was requested.

B. AREA SURVEYED ✓✓

The figure on the following page shows the approximate hydrographic survey limits.



Survey operations began on November 20, 1995 (DN 324), and ended on January 30, 1996 (DN 030).

C. SURVEY VESSELS ✓

NOAA launch 1101 (EDP# 0651) and launch 1102 (EDP# 0652) were used for all sounding data acquired.

No unusual vessel configurations were used.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

Survey data acquisition were accomplished using HYPACK for * Windows Version 5.9. The HDAPS programs listed in Separate I were used for all data processing. Data collected with HYPACK was converted to HDAPS format using a conversion program written by Hydrographic Surveys Division, N/CS3.

** Filed with the hydrographic data.*

The following non-data acquisition or processing computer programs were used:

<u>Program Name</u>	<u>Version</u>	<u>Date</u>
VELOCITY	2.21	1994
SVP	2.30	1994
NADCON	1.01	1989
INVERS3D	1.00	1991
MONITOR	3.0	1995
MAPINFO	4.0	1995
EXCEL	5.0	1994
GEOID93	1.00	1993

There were no nonstandard automated acquisition or processing methods used. Program MAPINFO was used to create and edit digital shoreline. This procedure is described in section J, "Shoreline."

E. SIDE SCAN SONAR EQUIPMENT ✓

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-T dual-channel, single-frequency towfish. The towfish was operated on the 100-kHz frequency and was configured with a 20° beam depression. The sonar equipment used throughout this survey were:

Towfish: SN 015598
Recorder: SN 015602

On launch 1101 and 1102, the towfish was deployed from a Superwinch Winch Model W115 from an adjustable davit arm on the stern of the launch. The SSS towfish was towed with Kevlar cable which was connected to the recorder cabling via a slip-ring assembly. The SSS towfish was maintained at a height off the bottom between 8 to 20 percent of the SSS range scale. At times, in depths greater than 50 meters, the towfish height was greater than 20% of the 200-meter range scale. PHP is confident the data collected during these times is adequate to identify contacts

which may be a hazard to navigation in these depths. SSS operations were limited to a speed-over-ground of 5 knots or slower on the 75- and 100-meter range scales and 4 knots or slower on the 150- and 200-meter range scales.

Offset, layback and height for the davit arm used to tow the SSS towfish from launch 1101 were measured on March 20, 1995 using the DSF6000 transducer as the reference. Offset, layback and height information for launch 1102 was measured on March 20, 1995, using the Innerspace 448 transducer as a reference.

All offset, layback and height data were applied as required by the HDAPS manual. These data can be found in Separate IV*.

All side scan sonar data was collected using the 75-, 100-, 150- and 200-meter range scales and 100-Khz frequency. In order to acquire the required 200% SSS coverage from the 5.5 meter curve to the 27.4 meter curve in the anchorage, main-scheme lines were run at a spacing of 60 meters on the 75-meter range scale, 75 meters on the 100-meter range scale and 100 meters on the 150-meter range scale. From the 27.4 meter to the 51.2 meter curve, where 100% coverage was required in the anchorage, line spacing was run at 200 meters. Lines were split or re-run in all areas where coverage was questionable due to degraded sonargrams.

In addition to the required SSS coverage in the anchorage, PHP acquired 200% SSS coverage in the Port area in locations where the fish could be safely towed.

Adequate coverage was determined by producing an 'A' and 'B' swath plot and ensuring 100% coverage on each plot.

Confidence checks were performed on a routine basis, primarily by noting changes in bottom texture on the outer edges of the sonargram.

SSS contacts were scaled from the sonargrams and entered onto SSS contact logs. Logged contacts were entered into HDAPS contact tables. See separate V* for contact tables.

Contacts were then grouped using HDAPS programs. After contacts were grouped, contacts having no match were checked for errors. Adjacent lines were re-scanned and matches were logged and recorded in HDAPS tables. Not all contacts had matching hits.

* Filed with the hydrographic data.

HDAPS programs were also used to "sift" contacts and help determine which contacts were significant. Significance was also determined by noting any irregularities in contact shape, shadow or characteristics. Significant contacts were developed using echosounder drift searches or regularly spaced echosounder lines as outlined in FPM section 7.2.2. Contacts which were not deemed significant by "sifting" or by PHP observation were not investigated. Not all significant contacts were developed because of their proximity to other more significant contacts or their inaccessibility due to log rafts.

F. SOUNDING EQUIPMENT ✓

A Raytheon Digital Survey Fathometer (DSF) 6000N (SN A121N) echo sounder was used on launch 1101 to measure bottom depths during the survey. The DSF 6000N produces an analog trace of the high frequency (100 kHz) and low frequency (24 kHz) bottom depths. Digital depths from the high frequency and low frequency beams were recorded by the acquisition system. High frequency depths were selected as the primary depths and are shown on the sounding plots.

Two Innerspace model 448 echosounders were used on launch 1102 to measure bottom depths during the survey. The Innerspace produces an analog trace of the bottom using a single frequency. Digital depths were recorded by the acquisition system and compared on line to the analog trace. The Innerspace Model 448 echosounders used during this survey are:

<u>Serial Number</u>	<u>Inclusive Days</u>
286	Nov. 20 - 21, 1995, (DN 240-241)
263	Nov. 22, 1995 - Jan. 30 1996 (DN 242-030)

Echograms were carefully reviewed for significant features along the track line. Any significant features on the graphic record that were not selected as primary soundings were manually inserted.

Preventative maintenance performed on all echosounders allowed them to be operated throughout the survey with little downtime.

A field constructed sounding pole was used to verify depths in shallow water when the DSF6000N was not digitizing properly on DN 016. The sounding pole was constructed in accordance with Hydrographic Survey Manual section AF.1.2 and Hydrographic Survey Guideline 69.

Field constructed metric lead lines were used for depth comparisons with the echosounders. PHP fabricated the lead lines following Hydrographic Survey Guideline 69. Leadline calibration forms are included in ~~Separate IV of this Descriptive Report.~~ * Leadlines were also used to verify depths in water where the DSF6000N appeared to be digitizing on sea grass, DN 325.

G. CORRECTIONS TO SOUNDINGS ✓✓

Sound velocity profiles of the water column were determined using two Applied Microsystems Laboratories sound velocity profilers (AML), SN 3042 and SN 3004.

A Data Quality Assurance (DQA) test was performed for each AML cast by using a thermometer and a bucket of fresh water. Program VELOCITY compared the thermometer temperature to the AML's temperature value to confirm that the velocity probe was working properly. There were no variations in instrument initials.

After each cast, program VELOCITY (version 2.21) was used to process the data, select significant data points and create a corrector table. The velocity correctors were manually entered into HDAPS velocity tables. Velocity profile data are in Separate IV. Three velocity casts were conducted for H-10662 as shown below:

DN's	Table #	Latitude	Longitude	Depth (m)
324-325	1	47°59'00"	122°16'06"	171.8
331-356	2	47°59'16"	122°16'00"	172.8
009-030	3	47°59'00"	122°15'42"	142.9

All sounding corrections were applied to both high and low frequency soundings.

* Filed with hydrographic records.

Lead-line comparisons were performed on launch 1101 and launch 1102 in accordance with the requirements stated in the Field Procedures Manual (FPM). These comparisons are annotated on the echograms and are included in the raw data.* No corrections to soundings were applied based on lead-line check data.

The correction for the static draft for launch 1101 is 0.5 meters, as measured on March 20, 1995. The correction for the static draft for launch 1102 is 0.4 meters as measured on April 14, 1994. Supporting data is included in Separate IV.*

Settlement and squat measurements for launch 1101 (Offset Table 1) were conducted and correctors determined on March 20, 1995. Settlement and squat measurements for launch 1102 (Offset Table 2) were conducted and correctors determined on May 5, 1994. New settlement and squat measurements for launch 1102 were conducted and correctors determined on January 12, 1996 (Offset Table 3). This table was applied to all data collected on and after January 12, 1996, DN 012 for launch 1102. The settlement and squat correctors were reapplied to the raw data during postprocessing. Settlement and squat corrector tables are in Separate IV.*

The tidal datum for this project is Mean Lower Low Water. The operating tide station Seattle, WA (944-7130) will serve as control for datum determination. A NEXGEN is the primary sensor at this location and could not be inspected by PHP. Levels were not required at this station.

PHP assisted Pacific Operations Group (POG) personnel install a Sutron 9000 digital acoustic water level sensor at the historic station, Everett, Possession Sound, Washington (944-7659) on November 1 and 2, 1995. The station was leveled by POG on these same dates. This station will provide information on zoning, tidal datums and harmonic constants. The station was installed with a GOES transmitter antennae which allowed PHP to download tide values from NESDIS. Supporting data for this station can be found in Appendix V.*

PHP periodically downloaded tidal values from NESDIS and used a field written EXCEL spreadsheet macro to automatically scan for high and low water levels. These values were entered into HDAPS predicted tide tables and applied to the digital data during post processing for preliminary sounding reduction.

H. CONTROL STATIONS ✓✓ See Eval Rpt., section 4.

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). All horizontal control met 3rd order class I standards.

A "fly-away" DGPS base station was established by PHP to calculate and broadcast GPS satellite signal correctors. This base station was used for all data acquisition. MONITOR results for the base station are in Separate III. *

The SNOHOMISH RIVER LIGHT 5 was surveyed to 3rd order standards and used as a DGPS fixed point performance check station.

A copy of the horizontal control station table is included in Appendix III. *A separate horizontal control report for this project was forwarded to N/CS34 on November 30, 1995.

I. HYDROGRAPHIC POSITION CONTROL ✓✓ See Eval Rpt., section I.

A Differential Global Positioning System (DGPS) was used as the primary navigation system for this survey. All data acquired met the accuracy requirements established in FPM section 3.4. The serial numbers of sensors used were as follows:

	Device	Serial Number
Launch 1101	Ashtech Receiver Maxon Transceiver	B0142 20813477
Launch 1102	Ashtech Receiver Maxon Transceiver	B0143 10511564
Base Station	Ashtech MX II Receiver Maxon Transceiver	B2505 20813540

An Ashtech Sensor GPS Receiver with a Maxon Communications VHF radio transceiver linked to the data acquisition system was used for launch positioning.

A Horizontal Dilution of Precision (HDOP) limit of 3.0 was computed for the project area as required in section 3.4.2 of the FPM. Data with HDOP values exceeding the 1:5,000 thresholds were rejected.

* Filed with the hydrographic records.

The HYPACK system does not record data if the DGPS initialization thresholds established by the FPM section 3.4.3.1 are exceeded. The operator can easily determine the signal integrity by monitoring the echogram and sonargram for fix annotations. The operator can also monitor the GPS with an on screen window which shows the HDOP and number of satellites used. Survey lines were rerun where control was unacceptable. *Data was analyzed during survey processing and found to contain no significant problems.*

Performance checks for the positioning systems were accomplished by using a fixed point and comparing a HYPACK position and range to that fixed point. This was done in accordance with the FPM section 3.4.4. Performance checks were conducted on a weekly basis using the performance check station surveyed by PHP. The station was established using static survey methods described in the GPS User's Manual version 3.0. All DGPS performance checks confirmed that the DGPS positioning systems were operating properly. Performance check data is submitted with the raw data. *

No unusual atmospheric conditions that may effect data quality were encountered. Antennae and towpoint layback and offset correctors were entered into HDAPS offset tables. These tables are in Separate IV. *

J. SHORELINE ✓ *See Evaluation Report, Section J.*

HSD supplied PHP with chart 18444, 1:25,000 scale, in digital form (raster image) and the source document, a photocopy of chart 18444 with notes and changes hand drawn on the chart. The digital chart did not contain all shoreline changes depicted on the source document.

In lieu of a final field sheet PHP used the following method to create a digital shoreline document for field verification purposes and expedite post-processing at the ^{HSD} PHP.

The PCX file of chart 18444, supplied by the Hydrographic Surveys Division, was registered in program MAPINFO. The shoreline features were then traced onto a separate MAPINFO layer "Source.tab" in brown. A portion of the source document was then scanned in two portions on an 8 1/2" x 14" flatbed scanner. These raster images were then registered in MAPINFO and the additional changes were traced to the Source.tab layer in brown. The Source.tab was then exported to a digital exchange format (.DXF) file.

* Filed with the hydrographic records.

Field verification was completed by maneuvering the survey launch along shore and observing the computer display and comparing the launch's position on the digitized source document and the existing shoreline. During this process field notes were annotated on hard copies of the source document. Verified items were marked OK and detached positions were taken at AWOIS positions, shoreline feature disprovals, and where corrections to the shoreline were needed. The hard copies of the source document can be found in a separate shoreline chartlet folder. *

After field shoreline verification and post processing was completed the detached positions were then stripped from the HDAPS processing system, entered into MAPINFO, and plotted over the digital shoreline "Source.tab". A new MAPINFO layer "Deleted.tab" was created and all the shoreline disprovals/deletions were copied to this layer and colored green. Another MAPINFO layer "Correctd.tab" was created and the source shoreline that was verified OK was copied to this layer in brown. New features and corrections to the digital source were made to layer Correctd.tab in red. Bottom samples and water body names were displayed on layer "bs_misc.tab" in black.

All MAPINFO files and Autocad 12 DXF format files are provided on floppy.

The shoreline in the Snohomish River between the North Wharf of Naval Station Everett and the Inset was not verified.

Detailed notes and discussions of shoreline changes are included in the shoreline chartlet folder. *

Shoreline on smooth is shown in brown from chart 18444 13th edition, August 31, 1991, for orientation only.

K. **CROSSLINES** ✓

Fifteen nautical miles of crosslines were run on H-10662. This amounted to 12 percent of the total linear nautical miles of main-scheme lines. Much of the SSS lines run in the anchorage were nearly perpendicular to the main scheme sounding lines and were used for crossline comparisons.

* Filed with the hydrographic data.

Crosslines and main-scheme agreement, with tides applied, was good. Most soundings agreed to within 0.1 meters with no errors greater than 0.4 meters.

L. JUNCTIONS ✓✓

No contemporary surveys junction with H-10662. *Concur*

M. COMPARISONS WITH PRIOR SURVEYS ✓✓ *See Evaluation Report, Section M.*

Prior survey comparisons will be performed by the Pacific Hydrographic Branch after smooth tides are applied.

PHP conducted a cursory comparison of soundings from H-10662 and prior surveys H-8173, 1:5000, 1954, H-8174, 1:10,000, 1954 and H-8754, 1:10,000, 1966. All prior survey data were referenced to NAD27. A datum shift from NAD27 to NAD83 was calculated. NAD27 tick marks were plotted on current data for comparison to prior surveys.

Soundings between H-10662 and prior H-8173 were generally within 2-3 feet. Contours between surveys agreed well. The 12 foot contour near 47°59'24"N, 122°14'10"W, has shifted approximately 200 m to the south. The dredging of the Snohomish River has altered the soundings at the mouth of the Snohomish River. Current soundings reflect the increased depth at the mouth of the river. Off of Port of Everett Pier 1, current soundings reflect recent dredging operations on the South side of this pier. The area was dredged in late 1995. PHP received a copy of the pre and post dredge surveys from the Port of Everett authorities in January 1996. This information is included with plots of H-10662. *A copy of this post dredge survey has been forwarded to N/CS3x1.*

The soundings in the common area of H-8174 and H-10662 were generally over 100 feet. Soundings compared well between H-10662 and H-8174 and were generally within 4-6 feet.

Common soundings between H-8754 and H-10662 were over 30 fathoms. Sounding comparison were generally within one fathom.

N. ITEM INVESTIGATIONS ✓ See Eval Report, Section N.

The items listed on the next page were investigated by PHP. Item investigation reports ~~are in Separate VI~~ are attached to this report.

Number	Item	Description
N1	12981.0	E/S hit
N2	AWOIS 52215	Rocks in inset
N3	AWOIS 52214	Wk
N4	17971.0S	SSS Contact
N5	19468.2P	SSS Contact
N6	18507.6S	SSS Contact
N7	19474.6P	SSS Contact
N8	17471.7S	SSS Contact
N9	17834.8S	SSS Contact
N10	AWOIS 52272	Wk
N11	AWOIS 52273	Wk
N12	AWOIS 52274	Wk
N13	AWOIS 52271	Area of Multiple Wk's
N14	AWOIS 52275	Area of Wk's
N15	17667.8P	SSS Contact
N16	19840.1S	SSS Contact
N17	17674.5P	SSS Contact
N18	19830.6P	SSS Contact
N19	19904.8S	SSS Contact
N20	19873.6S	SSS Contact
N21	19876.0S	SSS Contact
N22	19897.2S	SSS Contact
N23	19826.5P	SSS Contact
N24	17693.7S	SSS Contact
N25	19811.0P	SSS Contact
N26	1057.05S	SSS Contact
N27	17575.5P	SSS Contact
N28	19838.1S	SSS Contact
N29	19869.6S	SSS Contact
N30	19881.4P	SSS Contact
N31	19834.0S	SSS Contact
N32	19868.4P	SSS Contact

AWOIS items 522¹⁶~~217~~-52224 were verified or disproved during shoreline verification. Notes on these items are included with the raw data and can be compared to the shoreline information submitted with this survey. *

* Filed with the hydrographic data.

O. COMPARISON WITH THE CHART ✓✓

See Encl Rpt., section O.

Soundings and contours from H-10662 were compared with charted soundings from Chart 18444 and 18443. The agreement between charted soundings and current soundings was good. Generally soundings agreed within 2-3 feet. The following is a list of exceptions:

The area where the new Navy piers were constructed has been dredged. Current soundings are approximately 15 ft deeper than previously charted.

Area South of port of Everett pier 1 has recently been dredged. The chart shows depths as 35 ft (rep) 1974. Current survey depths are 10 ft deeper than charted. PHP received a pre and post dredge survey conducted in 1995. Current soundings agree with the post dredge survey. A copy of the post dredge survey is included with the plots of H-10662.

Current survey depths charted as 36 ft 1982 off the Navy pier "E" are shoaler by 8 feet. Other soundings in the northern part of the port show shoaling.

Current soundings charted in an area as 38 ft rep Nov 1973 just north of the port of Everett pier 3 are shoaler than charted by 4 ft.

PHP notes that the bottom of the harbor is very irregular with what appears on the echogram and sonargram to be debris. PHP believes the shoaling and irregularities in the port are caused by the considerable amount of construction and dredging that has occurred since the last survey and the large amount of logs which are shipped to and stored in the port area. The construction and dredging may have displaced large amounts of silt and bottom material in the harbor, which may have caused some shoaling in the harbor. The debris is likely logs which have become saturated and have sunk to the bottom. The Snohomish River also carries a considerable amount of sediment to the mouth of the port. This sediment may be carried into the port area by currents.

One Danger to Navigation Report was submitted on February 8, 1995 reporting four of the obstructions found in the East Waterway of the Port of Everett. A copy of the report is included in

appendix I. in this report.

PHP recommends the compass rose positioned at $47^{\circ}57.8'N$, $122^{\circ}13.6'W$ on chart 18444 be moved ^{Southwest} down approximately 2-5 inches. The compass rose as positioned now covers a landmark (R TR). The landmark is shown on chart 18443 and is charted at $47^{\circ}58'06"N$, $122^{\circ}13'25"W$. Due to the lack of landmarks in South Everett, the radio tower is an important landmark for ships in the anchorage and needs to be charted on 18444.

The Navy has requested that the layout of charts 18443 and 18444 be altered in order to facilitate safer navigation within the port. Navigating into the port requires switching from chart 18443 to 18444. Switching between the small scale chart, 18443 to the large scale chart, 18444 can only be done when a vessel is in or very near the port. In restricted waters this ties up personnel who are involved in navigation. The Navy requests the size and scale of chart 18443 be enlarged and the port, Navy Base and East Waterway be charted as an inset on this chart at 1:25,000 scale.

P. ADEQUACY OF SURVEY ✓

This survey is considered complete, and the data acquired are adequate to supersede all prior surveys of the common area.

Q. AIDS TO NAVIGATION ✓

Two fixed and four floating U.S. Coast Guard maintained aids to navigation were positioned during this survey. See ^{attached} Appendix II ^{forms} for specific information on each aid to navigation positioned.

Buoy "AO" is used to mark a wreck in the general anchorage off of Port Gardner. PHP located the wreck positioned 198 meters North of the buoy. PHP informed the Coast Guard of this discrepancy. See Appendix VI of this report. * See danger to navigation letter ^{attached} to this report.

The Snohomish River Buoy 3 was relocated during survey operations by the Coast Guard. PHP positioned this buoy after it was ^{relocated} repositioned. The Coast Guard received complaints from local mariners about the new position of the buoy. PHP sent a chartlet of the area with current soundings corrected to MLLW using preliminary real tides to the Coast Guard showing the position of

Filed with the survey data.

the buoy in relation to the western limit of the Snohomish river channel. See Appendix VI of this report.*

The current Light List descriptions and characteristics for the aids to navigation *are correct.*

The Navy's port operations tower was positioned to third order class 1 standards by PHP. The base of the mast was positioned and not the light on top of the mast. PHP received a detailed sketch of the tower from the Navy. The heights on the sketch were referenced to MLLW. The height of the light on the mast of the tower is reported as 128'½", referenced to MLLW. The sketch of the tower is in Appendix VI.* The characteristics of the light on the tower are fixed red. The light is maintained by the Navy.

The light is shown on the smoothsheet at

R. STATISTICS ✓

*lat. 47/59/24.3848N ✓
long. 122/13/20.658W ✓*

Number of Selected Soundings.....	14893 14869
Main-scheme Sounding Lines (Nautical Miles).....	120
Crosslines (Nautical Miles).....	12
Square Nautical Miles Surveyed.....	2.6
Days of Production.....	24
Detached Positions.....	107
Bottom Samples.....	13
Tide Stations Installed.....	1
Number of SV Casts.....	3

S. MISCELLANEOUS ✓

Bottom samples for the survey area were acquired in accordance with the Project Instructions and were not submitted to the Smithsonian institution.

No anomalies in either tide or current and/or unusual magnetic variations were encountered in the survey area.

T. RECOMMENDATIONS ✓

Recommendations concerning specific items are located in ~~separate VI of this report.~~ *Item Investigation reports attached to this report.*

Navy Pier B is still under construction. The platform of the

pier is not completed but the perimeter of the pier is complete except for the extreme NW corner. It is recommended that the pier be charted as completed and not charted under construction.

Pier is shown in solid red on the smooth sheet.
The Port of Everett has plans for construction that will alter the shoreline to the south of Pier 1.

U. REFERRAL TO OTHER REPORTS ✓

Report	Date Submitted
Horizontal Control Report	November 30, 1995
Danger to Navigation Report	February 9, 1996
Secchi Disk Observation Report	March, 1996

Submitted By:



Eric W. Berkowitz
Lieutenant (Junior Grade), NOAA

Station	Order	Position	Source
^{Everett} DGPS Base Station 101	3	47°59'39.28423"N 122°13'25.74956"W	Field Position
Snohomish River Lt5	3	47°59'16.67022"N 122°13'47.56252"W	Field Position

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

- TO BE CHARTED
- TO BE REVISED
- TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)

PHB

STATE

WA

LOCALITY

Possession Sound

DATE

1995

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
- GEODETIC PARTY
- PHOTO FIELD PARTY
- COMPILATION ACTIVITY
- FINAL REVIEWER
- QUALITY CONTROL & REVIEW GRP.
- COAST PILOT BRANCH

(See reverse for responsible personnel)

The following objects HAVE HAVE NOT been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.

OPR-N267-PHP

JOB NUMBER

H-10662

DATUM

NAD 83

POSITION

LATITUDE LONGITUDE

° / ° /

D.M. Meters D.P. Meters

// //

04.209" 14.744"

47 58 122 13

24.3845" 20.6583"

47 59 122 13

16.6702" 47.5623"

47 59 122 13

DESCRIPTION

(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)

Everett, Cablevision Mast, 1972 HT=300'
Item reported on CD 567 in 1973
(575') should be charted on 18444

Navy Operations Tower Lt., 1995
HT 117.8' above MHW (New)

Snohomish River LT "5"

METHOD AND DATE OF LOCATION
(See instructions on reverse side)

OFFICE

FIELD

V

3/12/73

FL

GPS

3 Order Class I

18423

18443

18444

CHARTS AFFECTED

18423

18443

18444

R.

TR.

R.

TR.

FL

G 4 s

17 ft

5M

"5"

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	<input type="checkbox"/> PHOTO FIELD PARTY <input type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'
(Consult Photogrammetric Instructions No. 64.)

OFFICE	FIELD (Cont'd)
I. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75	B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982
FIELD I. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection	II. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75
A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75	III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75

****PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.**

SECTION Q. DESCRIPTIVE REPORT INSERT ✓

NAME OF AID TO NAVIGATION Snohomish River Lighted Buoy 3
(AS PER LIGHT LIST)

LIGHT LIST # 18535

CHARTED POSITION: Lat 47° 58' 58.20" Long 122° 14' 02.60"

SURVEY POSITION: Lat 47° 58' 56.52" Long 122° 14' 04.14"

METHOD OF POSITION 3RD ORDER HYDRO POS. NO. 60 Lt 22323

DIFFERENCE BETWEEN SURVEY/CHARTED POSITION: 61 m 148 °T

CHARACTERISTICS MATCH LIGHT LIST YES NO IF NO EXPLAIN

PRIVATELY MAINTAINED YES NO

REQUEST FOR POSITION FORM USCG PER PROJECT INSTRUCTIONS YES NO

SERVES INTENDED PURPOSE YES NO IF NO EXPLAIN

FOR NEW AIDS TO NAVIGATION, PROVIDE THE FOLLOWING:

PURPOSE: _____

CHARACTERISTICS: _____

MAINTAINED BY*: _____

FREQUENCY OF MAINTENANCE*: _____

DATE OF ESTABLISHMENT*: _____

IF ANY OF THE ABOVE ITEMS CHANGE FROM THE LIGHT LIST, THE CHART OR ARE NEW A DANGER TO NAVIGATION LETTER NEEDS TO BE SENT TO THE COAST GUARD.

DTON LETTER SENT YES NO

* SUPPLY THIS INFORMATION IF IT CAN BE OBTAINED EASILY.

SECTION Q. DESCRIPTIVE REPORT INSERT ✓

NAME OF AID TO NAVIGATION Port Gardner Lighted Bell Buoy 1

LIGHT LIST # 18500 (AS PER LIGHT LIST)

CHARTED POSITION: Lat 47° 59' 22.6" Long 122° 15' 06.0"

SURVEY POSITION: Lat 47° 59' 23.18" Long 122° 15' 05.21"

METHOD OF POSITION 3RD ORDER HYDRO POS. NO. 19771

DIFFERENCE BETWEEN SURVEY/CHARTED POSITION: 24 m ³¹⁷/₁₃₇ °T

CHARACTERISTICS MATCH LIGHT LIST YES NO IF NO EXPLAIN

PRIVATELY MAINTAINED YES NO

REQUEST FOR POSITION FORM USCG PER PROJECT INSTRUCTIONS YES NO

SERVES INTENDED PURPOSE YES NO IF NO EXPLAIN

FOR NEW AIDS TO NAVIGATION, PROVIDE THE FOLLOWING:

PURPOSE: _____

CHARACTERISTICS: _____

MAINTAINED BY*: _____

FREQUENCY OF MAINTENANCE*: _____

DATE OF ESTABLISHMENT*: _____

IF ANY OF THE ABOVE ITEMS CHANGE FROM THE LIGHT LIST, THE CHART OR ARE NEW A DANGER TO NAVIGATION LETTER NEEDS TO BE SENT TO THE COAST GUARD.

DTON LETTER SENT YES NO

* SUPPLY THIS INFORMATION IF IT CAN BE OBTAINED EASILY.

This fixed aid plots within the inset for Aids 52215.

SECTION Q. DESCRIPTIVE REPORT INSERT ✓

NAME OF AID TO NAVIGATION Snohomish River Channel Light 6
(AS PER LIGHT LIST)

LIGHT LIST # 18590

CHARTED POSITION: Lat 48° 01' 07.0" Long 122° 12' 48.0"

SURVEY POSITION: Lat 48° 01' 07.15" Long 122° 12' 48.27"

METHOD OF POSITION 3RD ORDER HYDRO POS. NO. 19451

DIFFERENCE BETWEEN SURVEY/CHARTED POSITION: 7 m ⁰⁵⁰/₂₃₀ °T

CHARACTERISTICS MATCH LIGHT LIST YES NO IF NO EXPLAIN

PRIVATELY MAINTAINED YES NO

REQUEST FOR POSITION FORM USCG PER PROJECT INSTRUCTIONS YES NO

SERVES INTENDED PURPOSE YES NO IF NO EXPLAIN

FOR NEW AIDS TO NAVIGATION, PROVIDE THE FOLLOWING:

PURPOSE: _____

CHARACTERISTICS: _____

MAINTAINED BY*: _____

FREQUENCY OF MAINTENANCE*: _____

DATE OF ESTABLISHMENT*: _____

IF ANY OF THE ABOVE ITEMS CHANGE FROM THE LIGHT LIST, THE CHART OR ARE NEW A DANGER TO NAVIGATION LETTER NEEDS TO BE SENT TO THE COAST GUARD.

DTON LETTER SENT YES NO

* SUPPLY THIS INFORMATION IF IT CAN BE OBTAINED EASILY.

This floating aid plots within the inset for Aids 52215

SECTION Q. DESCRIPTIVE REPORT INSERT ✓

NAME OF AID TO NAVIGATION Susquehanna River Buoy SA
(AS PER LIGHT LIST)

LIGHT LIST # 18586

CHARTED POSITION: Lat ^{48°} 48° 01' 09.5" Long 122° 12' 56.2"

SURVEY POSITION: Lat 48° 01' 08.98" Long 122° 12' 57.60" ✓

METHOD OF POSITION 3RD ORDER HYDRO POS. NO. 19450

DIFFERENCE BETWEEN SURVEY/CHARTED POSITION: 33 m ¹¹⁸ 298 °T

CHARACTERISTICS MATCH LIGHT LIST YES NO IF NO EXPLAIN

PRIVATELY MAINTAINED YES NO

REQUEST FOR POSITION FORM USCG PER PROJECT INSTRUCTIONS YES NO

SERVES INTENDED PURPOSE YES NO IF NO EXPLAIN

FOR NEW AIDS TO NAVIGATION, PROVIDE THE FOLLOWING:

PURPOSE: _____

CHARACTERISTICS: _____

MAINTAINED BY*: _____

FREQUENCY OF MAINTENANCE*: _____

DATE OF ESTABLISHMENT*: _____

IF ANY OF THE ABOVE ITEMS CHANGE FROM THE LIGHT LIST, THE CHART OR ARE NEW A DANGER TO NAVIGATION LETTER NEEDS TO BE SENT TO THE COAST GUARD.

DTON LETTER SENT YES NO

* SUPPLY THIS INFORMATION IF IT CAN BE OBTAINED EASILY.

SECTION Q. DESCRIPTIVE REPORT INSERT ✓

NAME OF AID TO NAVIGATION Snohomish River Light 5
(AS PER LIGHT LIST)

LIGHT LIST # 18535

CHARTED POSITION: Lat 47° 59' 16.3" N Long 122° 13' 47.3"

SURVEY POSITION: Lat 47° 59' 16.67" N Long 122° 13' 47.56"

METHOD OF POSITION 3RD ORDER HYDRO POS. NO. FROM HORCON REPORT - DPR - N267 - PMP

DIFFERENCE BETWEEN SURVEY/CHARTED POSITION: 13 m 0.25 205 °T

CHARACTERISTICS MATCH LIGHT LIST YES NO IF NO EXPLAIN

PRIVATELY MAINTAINED YES NO

REQUEST FOR POSITION FORM USCG PER PROJECT INSTRUCTIONS YES NO

SERVES INTENDED PURPOSE YES NO IF NO EXPLAIN

FOR NEW AIDS TO NAVIGATION, PROVIDE THE FOLLOWING:

PURPOSE: _____

CHARACTERISTICS: _____

MAINTAINED BY*: _____

FREQUENCY OF MAINTENANCE*: _____

DATE OF ESTABLISHMENT*: _____

IF ANY OF THE ABOVE ITEMS CHANGE FROM THE LIGHT LIST, THE CHART OR ARE NEW A DANGER TO NAVIGATION LETTER NEEDS TO BE SENT TO THE COAST GUARD.

DTON LETTER SENT YES NO

* SUPPLY THIS INFORMATION IF IT CAN BE OBTAINED EASILY.

SECTION Q. DESCRIPTIVE REPORT INSERT ✓

NAME OF AID TO NAVIGATION Port Gardner Anchorage Obstruction Lighted
(AS PER LIGHT LIST) Buoy AO

LIGHT LIST # 18505

CHARTED POSITION: Lat 47° 58' 56.70" Long 122° 14' 47.80"

SURVEY POSITION: Lat 47° 58' 55.70" Long 122° 14' 47.00"

METHOD OF POSITION 3RD ORDER HYDRO POS. NO. 18505

DIFFERENCE BETWEEN SURVEY/CHARTED POSITION: 33 m 201 °T

CHARACTERISTICS MATCH LIGHT LIST YES NO IF NO EXPLAIN

PRIVATELY MAINTAINED YES NO

REQUEST FOR POSITION FORM USCG PER PROJECT INSTRUCTIONS YES NO

SERVES INTENDED PURPOSE YES NO IF NO EXPLAIN

Buoy is 198m S. of the wreck which it is marking in the anchorage.

FOR NEW AIDS TO NAVIGATION, PROVIDE THE FOLLOWING:

PURPOSE: _____

CHARACTERISTICS: _____

MAINTAINED BY*: _____

FREQUENCY OF MAINTENANCE*: _____

DATE OF ESTABLISHMENT*: _____

IF ANY OF THE ABOVE ITEMS CHANGE FROM THE LIGHT LIST, THE CHART OR ARE NEW A DANGER TO NAVIGATION LETTER NEEDS TO BE SENT TO THE COAST GUARD.

DTON LETTER SENT YES NO

* SUPPLY THIS INFORMATION IF IT CAN BE OBTAINED EASILY.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-0070

**ADVANCE
INFORMATION**

December 23, 1996

Commander (OAN)
13th U.S. Coast Guard District
Federal Building
915 Second Ave
Seattle, WA 98174-1067

Dear Sir:

During office review of hydrographic survey H-10662, Washington, Possession Sound, Port Gardner, a charted submerged wreck was repositioned. This change affects the following charts.

<u>Chart</u>	<u>Edition/date</u>	<u>Datum</u>
18423	30th, 6/18/94	NAD 83
18443	14th, 3/24/90	NAD 83
18444	13th, 8/31/91	NAD 83

It is recommended that the enclosed Report of Dangers to Navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6836.

Sincerely,

Kathy A. Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Enclosure

cc: DMA/HTC
NCS/261



**ADVANCE
INFORMATION**

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10662

Survey Title: State: WASHINGTON
Locality: POSSESSION SOUND
Sublocality: PORT GARDNER

Project Number: OPR-N267-PHP, Pacific Hydrographic Party

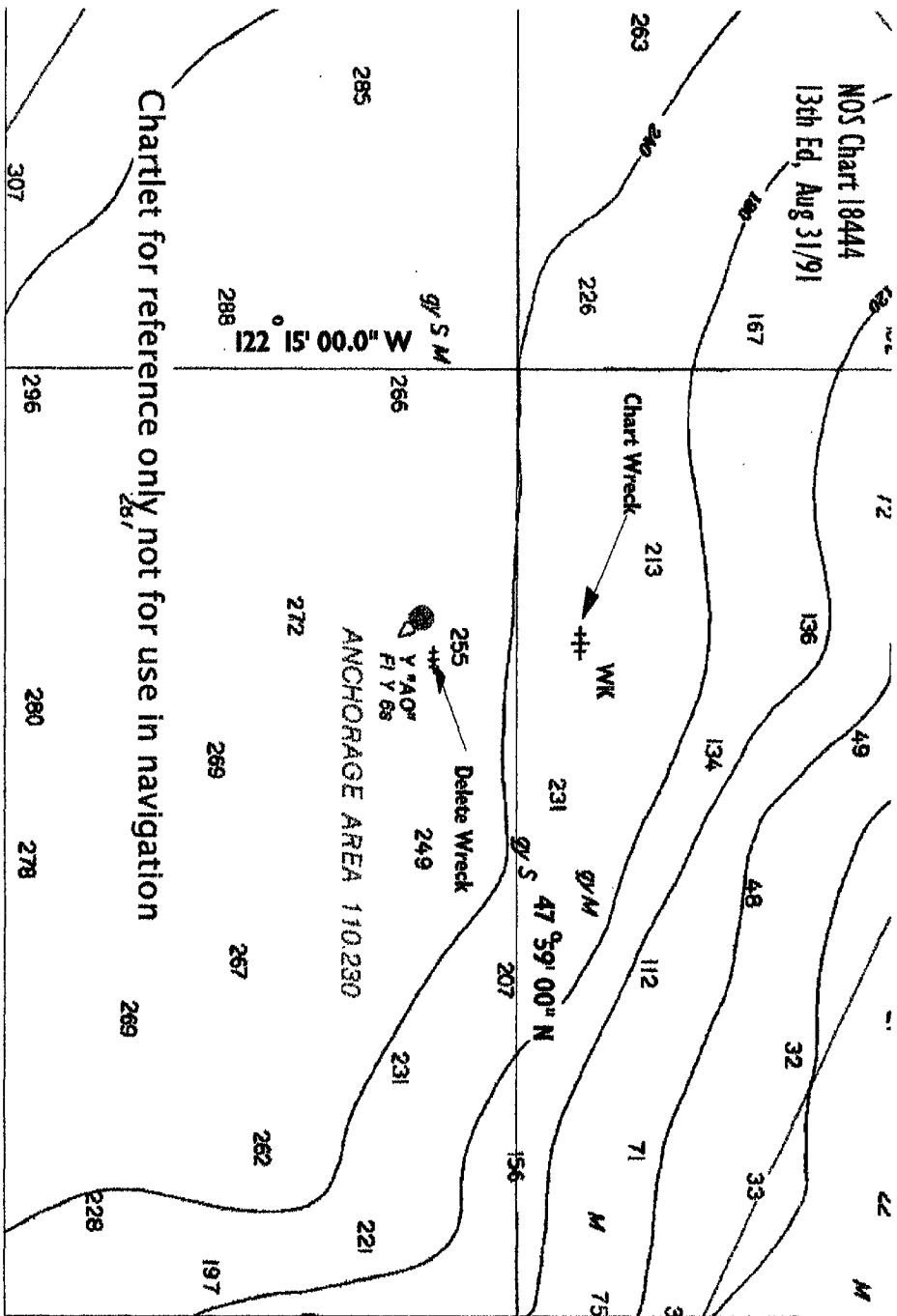
Survey Date: November 20, 1995 - January 30, 1996

Depths are reduced to Mean Lower Low Water using approved tides and are referenced to NAD 83.

Charts affected:	<u>Chart</u>	<u>Edition/date</u>	<u>Datum</u>
	18423	30th, 6/18/94	NAD 83
	18443	14th, 3/24/90	NAD 83
	18444	13th, 8/31/91	NAD 83

Delete submerged wreck charted at Latitude 47°58'57.34 (N), Longitude 122°14'45.49(W) and add submerged wreck (covered 167 feet) at Latitude 47°59'01.947(N), Longitude 122°14'46.299(W). The surveyed position is approximately 194 meters north of the charted position.

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6836.



ADVANCE
INFORMATION



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SERVICE
 Coast and Geodetic Survey
 Seattle, Washington 98115-0070

**ADVANCE
 INFORMATION**

Pacific Hydrographic Party
 2000 West Marine View Drive
 Everett, WA 98207-5000

February 8, 1996

Commander
 13th Coast Guard District (OAN)
 Federal Building, Room 3410
 915 Second Avenue
 Seattle, WA 98174

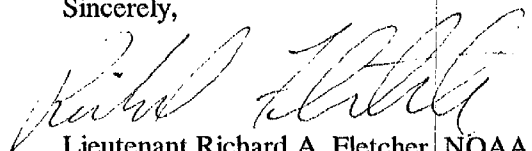
Dear Sir:

The Pacific Hydrographic Party has discovered several potential dangers to navigation while conducting survey operations in Port Gardner, Everett, Washington. A Danger to Navigation report is enclosed along with a chartlet showing the affected portion of chart 18444.

I recommend the following dangers to navigation be included in the next Local Notice to Mariners:

Item	Latitude	Longitude	Depth (ft)
Obstruction	47° 58' 58.509"	122° 13' 25.175"	20
Obstruction	47° 59' 00.598"	122° 13' 20.692"	24 25
Obstruction	47° 59' 04.423"	122° 13' 21.977"	23 24
Obstruction	47° 59' 05.600"	122° 13' 17.964"	27 30

Sincerely,


 Lieutenant Richard A. Fletcher, NOAA
 Chief, Pacific Hydrographic Party

Enclosures (5)

CC: DMAHTC
 N/CS3
 N/CS34



REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10662

**ADVANCE
INFORMATION**

Survey Title:

State: Washington

General Locality: Possession Sound

Sublocality: Port Gardner

Project Number: OPR-N267-PHP

The following item, which is a potential danger to navigation, was discovered during hydrographic survey operations by the Pacific Hydrographic Party. Soundings are corrected to MLLW based on preliminary real tide data.

Object Discovered: *Obstruction, 1.9 m high*

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No. Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Latitude</u>	<u>Longitude</u>
<i>1844</i>	<i>13th Aug 31/11</i>	<i>20 ft</i>	<i>NAD83</i>	<i>47°58'58.509"</i>	<i>122°13'25.175"W</i>

Questions concerning this report should be directed to NOAA, Pacific Hydrographic Branch, N/CS34, 7600 Sand Point Way NE, Bin C15700, Seattle, WA 98115-0070, 206-526-6836.

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10662

**ADVANCE
INFORMATION**

Survey Title:

State: Washington

General Locality: Possession Sound

Sublocality: Port Gardner

Project Number: OPR-N267-PHP

The following item, which is a potential danger to navigation, was discovered during hydrographic survey operations by the Pacific Hydrographic Party. Soundings are corrected to MLLW based on preliminary real tide data.

Object Discovered: *Obstruction, 3m High*

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No. Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Latitude</u>	<u>Longitude</u>
18444	13th Aug 31/91	<i>20 25 ft 24*</i>	NAD83	47°59'00.598"	122°13'20.692"

** based on actual tides*

Questions concerning this report should be directed to NOAA, Pacific Hydrographic Branch, N/CS34, 7600 Sand Point Way NE, Bin C15700, Seattle, WA 98115-0070, 206-526-6836.

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10662

**ADVANCE
INFORMATION**

Survey Title:

State: Washington

General Locality: Possession Sound

Sublocality: Port Gardner

Project Number: OPR-N267-PHP

The following item, which is a potential danger to navigation, was discovered during hydrographic survey operations by the Pacific Hydrographic Party. Soundings are corrected to MLLW based on preliminary real tide data.

Object Discovered: *Obstruction, 2.9 m high.*

Affected Nautical Charts:

Chart Number	Edition No. Date	Reported Depth	Chart Datum	Latitude	Longitude
18444	13 th Aug 31/91	24 ft 23*	NAD 83	47°59'04.423"	122°13'21.977"W

* based on actual tides

Questions concerning this report should be directed to NOAA, Pacific Hydrographic Branch, N/CS34, 7600 Sand Point Way NE, Bin C15700, Seattle, WA 98115-0070, 206-526-6836.

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10662

**ADVANCE
INFORMATION**

Survey Title:

State: Washington

General Locality: Possession Sound

Sublocality: Port Gardner

Project Number: OPR-N267-PHP

The following item, which is a potential danger to navigation, was discovered during hydrographic survey operations by the Pacific Hydrographic Party. Soundings are corrected to MLLW based on preliminary real tide data.

Object Discovered: *Obstruction, 2.3 m high.*

Affected Nautical Charts:

Chart Number	Edition No. Date	Reported Depth	Chart Datum	Latitude	Longitude
<i>18444</i>	<i>13th Aug 31/91</i>	<i>30ft 29*</i>	<i>NAD83</i>	<i>47°59'05.600"</i>	<i>122°13'17.964"</i>

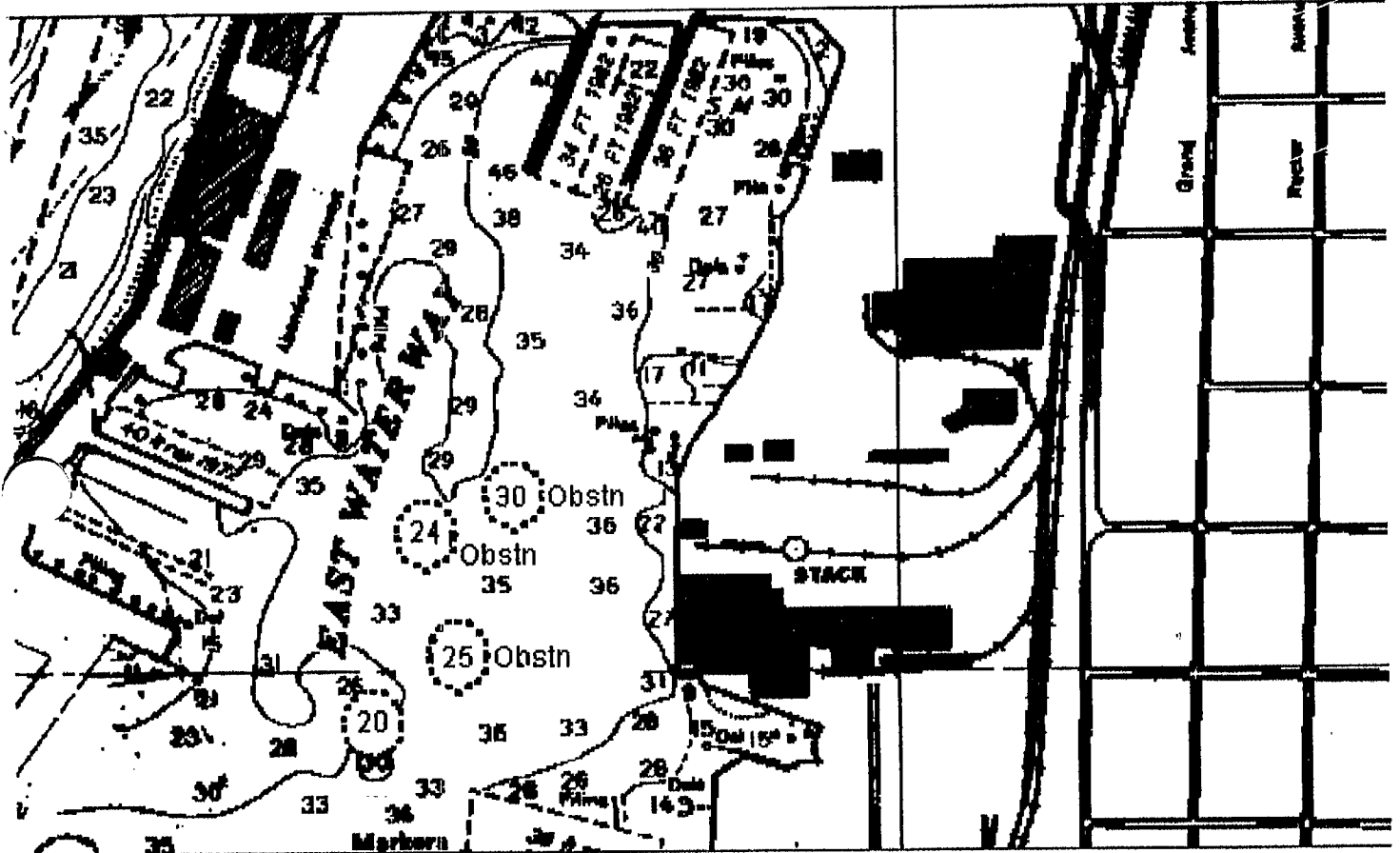
** based on actual tides*

Questions concerning this report should be directed to NOAA, Pacific Hydrographic Branch, N/CS34, 7600 Sand Point Way NE, Bin C15700, Seattle, WA 98115-0070, 206-526-6836.

CHARTLET OF CHART 18444
PORT GARDNER, WASHINGTON

Danger to Navigation Report
OPR-N267-PHP

ADVANCE
INFORMATION





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey
Seattle, Washington 98115-0070

Pacific Hydrographic Party, NOAA
900 47th Ave, N.E.
Olympia, WA. 98506

April 26, 1996

**ADVANCE
INFORMATION**

Commander
13th Coast Guard District (OAN)
Federal Building, Room 3410
915 Second Avenue
Seattle, WA 98174

Dear Sir:

The Pacific Hydrographic Party submitted a danger to navigation letter dated February 8, 1996. After further review, it was determined that a 20ft obstruction was incorrectly reported at 47°58'58.509"N, 122°13'25.175"W. The actual depth at this position is 27ft, reduced to MLLW using predicted tides.

It is recommended that the following be published in the next LNM:

Delete 20ft obstruction at 47°58'58.509"N, 122°13'25.175"W.

If you have any questions please contact the Pacific Hydrographic Party at the above telephone number and address.

Sincerely,

Lieutenant Richard A. Fletcher, NOAA
Chief, Pacific Hydrographic Party

cc: DMAHTC
N/CS3
N/CS34



ITEM INVESTIGATION-N1

Item: 12981.0

DN: 334

Chart(s): 18444, 18443

VN: 0651

Description: E/S trace

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 46.123"	122° 14' 31.040" <i>9 AWB</i>	14863.0

Positioned By: DGPS

Method of Investigation: This item was investigated by divers.

Findings: Divers conducted a circle search of the area and found sea grass. Similar looking E/S traces were investigated using leadlines. These comparisons showed the echo sounder was not digitizing the bottom, but was in fact digitizing sea grass.

.....
DIVING INVESTIGATION

Divers descended an anchor line dropped on the position of the item. Divers conducted a circle search in zero visibility water. No item was located. Divers noted very thick sea grass in the area.
.....

Charting Recommendations: Chart current survey soundings in area. - *CONCUR* ✓

.....Compilation Use Only

Chart

Applied

✓ E/S, AWOIS REVIEW

ITEM INVESTIGATION-N2

Item: AWOIS 52215 ✓

DN: 347

Chart(s): 18444

VN: 0651

Description: Rocks

Source: Verbally reported by local tug company to Lt. Rick Fletcher, NOAA

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Reported:	48°01'10.5"	122°12'58.6"	18706.1
Observed:	47°59'04.463" 48°01'08.807"	122°14'50.697" 122°12'56.219"	19616.0
Positioned By:	DGPS		
Method of Investigation:	10 m line spacing in AREA of item.		
Findings:	10 m HIGH SPIKES NEAR BUOY '5A' WHICH APPEAR TO BE AN EXTENSION OF THE POINT OF JETTY ISLAND.		

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: ~~Chart current SOUNDINGS IN AREA:
0.7m, 2 ft @ 47°59'04.463"N, 122°14'50.697"W.
1.1m, 3 ft @ 48°01'09.189"N, 122°12'56.209"W.~~
CONCUR ✓

.....
Compilation Use Only

Chart

Applied

✓ EJS - AWOIS REVIEW

ITEM INVESTIGATION-N3

Item: AWOIS 52214 ✓

DN: 348, 352

Charts(s): 18444, 18443

VN: 0651

Description: Wk

Source: LNM43/82

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	47° 58' 57.34"	122° 14' 45.49"	
Observed:	47° 59' 01.947"	122° 14' 46.299"	19968.1

Positioned By: DGPS

Method of Investigation: Ten meter line spacing over SSS scaled position.

Findings: PHP Located a wreck 143m N of the charted position of wreck. The Buoy "A01" USED TO MARK the position of this wreck was positioned 194 meters North of the wk developed by PHP. PHP HAS NOTIFIED THE COAST GUARD ABOUT THE DISCREPENCY IN THE POSITION OF THE WK AND THE POSITION OF THE BUOY.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: Delete wk charted at 47° 58' 57.34" N, 122° 14' 45.49" W. Chart wk at 47° 59' 01.947" N, 122° 14' 46.299" W. CONCUR, WK charted at above position. ✓

.....
Compilation Use Only

Chart

Applied

✓ EJS AWOIS Reviews

ITEM INVESTIGATION-N4 ✓

Item: 17971.0S

DN: 008

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°58'43.327"	122°13'43.389" *	21522.1
Positioned By:	DGPS		

Method of Investigation: Ten meter echo sounder lines over SSS scaled position.

Findings: PHP located an obstruction extending 2.6 meters off the bottom with a least depth of 80 ft (24.5 m).

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: PHP recommends charting ~~an obstruction~~ with a least depth of ^{79*}80 ft (13 fathoms) at 47°58'43.269"N, 122°13'49.634"W, with smooth tides applied. -concur ✓
This sounding plots fifty meters west of position 21522.1 and is shown for charting purposes. ✓
..... Compilation Use Only

Chart

Applied

✓ EJS AWOLIS Review

ITEM INVESTIGATION-N5 ✓

Item: 19468.2P

DN: 011

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59'24.132"	122° 14'29.324"	22194.0

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: PHP did not locate any items in the search area.

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: PHP recommends charting current soundings in the area. - CONCUR ✓

.....Compilation Use Only

Chart

Applied

✓ EJS AWOL REVIEW

ITEM INVESTIGATION-N6 ✓

Item: 18507.6S

DN: 011

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 22.629"	122° 14' 29.628"	22235.51

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: PHP located a rise in the bottom topography of approximately 1.5 meters.

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: PHP recommends charting a sounding of ^{14 2.3} 16 ft (2.7 fathoms) at 47° 59' 22.629"N, 122° 14' 29.628"W, with smooth tides applied. — CONCUR ✓

.....Compilation Use Only

Chart

Applied

✓ EJS AWOIS REVIEW

ITEM INVESTIGATION-N7 ✓

Item: 19474.6P

DN: 011

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 22.607" 29 CWB	122° 14' 29.618" 2 CWB	22235.1
Positioned By:	DGPS		
Method of Investigation: Drift search over scaled SSS position.			
Findings:	1.5 m rise in bottom depths. Depth of 16 ft.		

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: Chart sounding of 16 ft at 47° 59' 22.607" N
122° 14' 29.618" W. Same area as
item investigation N7. Chart 14' as shown on survey. ✓

.....Compilation Use Only

Chart

Applied

✓ Avoid Review EJS

ITEM INVESTIGATION-N8 ✓

Item: 17471.7S

DN: 011

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP



GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'11.939"	122°13'43.412"	22259.1

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: PHP located an obstruction which extends approximately 1.8 meters off the bottom with a least depth of 32 ft (5 fathoms) .



DIVING INVESTIGATION

N/A



Charting Recommendations: ~~PHP recommends charting an obstruction with a least depth of 32 ft (5 fathoms) at 47°59'11.939"N, 122°13'43.412"W. Do not chart, items depth is well below controlling depth of USACE MAINTAINED channel. - CONCUR ✓~~

.....Compilation Use Only ✓

Chart

Applied

✓ ALWAYS REVIEW EJS

ITEM INVESTIGATION-N9 ✓

Item: 17834.8S

DN: 011

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP



GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
--	----------	-----------	------------

Charted: N/A

Observed: 47°59'19.582" 122°13'37.461"

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: PHP located an obstruction which extends 1.2 m off the bottom with a least depth of 34ft (5 fathoms).



DIVING INVESTIGATION

N/A



Charting Recommendations: ~~PHP recommends charting an obstruction with a least depth of 34 ft (5 fathoms) at 47°59'19.582"N, 122°13'37.461"W.~~ Do not chart, least depth of item is below controlling depth of USACE MAINTAINED CHANNEL - CONCUR ✓✓

.....Compilation Use Only

Chart

Applied

✓ Avoid Revision 875

ITEM INVESTIGATION-N 10 ✓

Item: AWOIS 52272 ✓

DN: 011

Chart(s): 18444

VN: 0651

Description: WK

Source: BP/156842/95--NDS CRS

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	47° 59' 28.326 ⁰ " N	122° 13' 48.20" W	
Observed:	47° 59' 28.326" N	122° 13' 50.10 ⁹⁸⁷ " W	22324.0

Positioned By: DGPS

Method of Investigation: Visual inspection at low tide

Findings: PHP located the remains of a WK which uncovers 6 feet at MLLW.

.....
DIVING INVESTIGATION

.....
Charting Recommendations: Retain WK Charted at 47° 59' 28.30" N,
122° 13' 48.20" W. → CONCUR ✓ ✓

.....
Compilation Use Only

Chart

Applied

✓ AWOIS REVIEW EJS

ITEM INVESTIGATION-N II ✓

Item: ~~522~~ AWOIS 52273 ✓

DN: 011

Chart(s): 18444

VN: 0651

Description: WK

Source: BP 156042/95 - NOS CRS

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	47° 59' 47.70" N	122° 13' 45.91" W	
Observed:	47° 59' 44.124" N	122° 13' 53.586" W	22327.0

Positioned By: DGES

Method of Investigation: Visual inspection at low tide.

Findings: PHTP WAS UNABLE TO GET ALL THE WAY TO THE WRECK HOWEVER THE WK WAS VISUALLY OBSERVED, SEE PHOTOGRAPHS ON DN 011 WITH RAW DATA.

.....
DIVING INVESTIGATION

Charting Recommendations: ^{twB} Chart Area of wrecks From 122° 13' 42.4" W, 47° 58' 15.2" N TO 122° 13' 57" W 47° 59' 43.3" N TO 122° 13' 57" W 47° 59' 39.0" N TO 122° 13' 44.4" W 47° 59' 34.0" N. ^{9 49.5} ~~Concur~~, chart limit line of wreckage as shown on survey. ✓

.....Compilation Use Only

Chart

Applied

✓ AWOIS Review 633

ITEM INVESTIGATION-N12 ✓

Item: AWOIS 52274 ✓

DN: 011

Chart(s): 18444

VN: 0651

Description: WK

Source: BP 156642/95--NOS CRS

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	47° 59' 47.70"	122° 13' 45.90"	
Observed:	47° 59' 44.124"	122° 13' 53.506"	22327.0

Positioned By: DGPS

Method of Investigation: VISUAL INSPECTION AT LOW TIDE

Findings: RHP WAS UNABLE TO GET ALL THE WAY TO THE WRECK, HOWEVER THE ITEM WAS OBSERVED AND PHOTOGRAPHED. PHOTOGRAPHS ARE INCLUDED WITH THE RAW DATA.

.....
DIVING INVESTIGATION

.....
Charting Recommendations: Chart Area of WRECKS FROM 122° 13' 42.4" W, 47° 59' 49.5" N TO 122° 13' 57.0" W, 47° 59' 43.3" N TO 122° 13' 57.00" W, 47° 59' 39.0" N TO 122° 13' 44.4" W, 47° 59' 34.0" N. Same as item N11 ✓

.....Compilation Use Only

Chart

Applied

ITEM INVESTIGATION-N 13 ✓

Item: AWOIS 52271 ✓

DN: 011

Chart(s): 18444

VN: 0651

Description: Area of multiple wrecks

Source: BP 106318/79 -- NANCEI

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	47°49'40.70"	122°13'50.50"	
Observed:	47°59' 44.22 39.365"	122°13' 52.500 56.101"	22325

Positioned By: D6PS

Method of Investigation: VISUAL INSPECTION DURING LOW TIDE

Findings: PHP LOCATED AN AREA OF WRECKAGE AS
Charted.

.....
DIVING INVESTIGATION

.....
Charting Recommendations: Chart area of wrecks From 122°13'42.4"W,
47°59'49.5"W TO 122°13'57.0"W, 47°59'43.3"N TO 122°13'57.0"W,
47°59'39.0"N TO 122°13'44.4"W, 47°59'34.0"N. Same as
CONCUR item N11 ✓

.....
.....Compilation Use Only

Chart

Applied

✓AWOIS Review EJS

ITEM INVESTIGATION-N 14 ✓

Item: AWOIS 52275 ✓

DN: 011

Chart(s): 18444

VN: 0651

Description: Area of WK's along Jetty

Source: BF 106318/79--NANCI

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	47°59'39.30"	122°13'45.10"	
Observed:	47°59'44.124"	122°13'53.586"	22327

Positioned By: DGPS

Method of Investigation: VISUAL INSPECTION at low tide

Findings: PHP WAS UNABLE TO REACH THE CHARTED POSITION ABOVE, HOWEVER WRECKAGE WAS VIEWED AND PHOTOGRAPHED ALONG THE JETTY AT FIX 22327. PHOTOGRAPHS ARE SUBMITTED WITH RAW DATA.

.....
DIVING INVESTIGATION

.....
Charting Recommendations: Chart area of wrecks From 122°13'42.4"W, 47°59'49.5"N to 122°13'57.0"W, 47°59'43.3"N to 122°13'57.0"W, 47°59'39.0"N to 122°13'44.4"W, 47°59'34.0"N. CONCUR, same as item N11 ✓

.....
.....Compilation Use Only

Chart

Applied

✓ AWOIS Review BJS

ITEM INVESTIGATION-N15 ✓

Item: 17667.8P

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP



GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°58'55.50"	122°13'25.175"	22681.1
Positioned By:	DGPS		
Method of Investigation:	Drift search over scaled SSS position.		
Findings:	PHP located an obstruction 1.5 m high with a least depth of 3 ² / ₈ ft (6 fathoms).		



DIVING INVESTIGATION

N/A



Charting Recommendations: ~~Chart obstruction with least depth known at 47°58'55.50"N, 122°13'25.175"W. Do not chart, surrounding survey depths are shoaler. Chart current survey depths.~~

..... Compilation Use Only ~~Do not concern, surrounding depths~~
Chart Applied ~~are deeper.~~ chart 32' obstr at survey position. ✓

ITEM INVESTIGATION-N16 ✓

Item: 19840.1S

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°58'58.509"	122°13'25.175"	
Positioned By:	DGPS		
Method of Investigation: Drift search over scaled SSS position.			
Findings:	Obstruction, 1.9 m high with least depth of 20 ft (3.3 fathoms).		

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: Chart obstruction with least depth of 20'
KNOWN at
at 47°58'58.509"N, 122°13'³⁰~~25~~175"W, with smooth
tides applied.

.....Compilation Use Only

Chart

Applied

CONCUR ✓

✓ Awois Review (ST)

ITEM INVESTIGATION-N17 ✓

Item: 17674.5P

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 00.598"	122° 13' 20.692"	22 716.1
Positioned By:	DGPS		
Method of Investigation:	Drift search over scaled SSS position.		
Findings:	An obstruction 3 m high with a least depth of 24 ft. (Based on approved tides) See below for charting recommendation.		

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: Chart obstruction with least depth of 24' known at 47° 59' 00.598" N, 122° 13' 20.692" W. ✓

CONCUR

.....Compilation Use Only

Chart

Applied

✓ AWOL'S REVIEW EJS

ITEM INVESTIGATION-N18 ✓

Item: 19830.6P

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'00.764"	122°13'20.547"	22747.0

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: An obstruction 2.3 m high with a least depth of 29 ft (45 fathoms).

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: Do not chart, item 17674.5P is within 10 m from contact this item. CONCUR, ✓
sndg. has been excassed by 24' (N17) ✓

.....Compilation Use Only

Chart

Applied

✓AWOIS REVIEW (S)

ITEM INVESTIGATION-N19 ✓

Item: 19904.8S

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
--	----------	-----------	------------

Charted: N/A

Observed: 47°59'04.423" 122°13'21.977"

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: ~~NO~~ A 2.9 m high obstruction.
Least depth: 24 ft (4 fathoms). See below for final reduced
sounding value based on approved tides.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: Chart obstruction with a least depth ^{of 23'} known
at 47°59'04.423" N, 122°13'21.977" W, with smooth
tides applied. - CONCUR ✓ ✓

.....Compilation Use Only

Chart

Applied

✓ Always REVIEW ES>

ITEM INVESTIGATION-N20 ✓

Item: 19873.6S

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 07.855"	122° 13' 25.762"	22 859.1
Positioned By:	DGPS		

Method of Investigation: Drift search over scaled SSS position.

Findings: A 3.8 meter high obstruction.

Least depth: 21 ft.

Position 23668, DN 18, at latitude 47/59/07.910, longitude 122/13/25.520 is an 18' depth supporting the obstruction identified above.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: ~~Chart obstruction with least depth unknown at 47° 59' 07.855" N, 122° 13' 25.762" W. Do not chart surroundings. Depths are shallower, item is < 10m from pile AND item is within log boom area.~~

.....
Compilation Use Only

Chart

~~Do not~~ Case Item is outside log boom Applied area limits and surrounding depths are deeper. ✓
Chart 18 ft obsth at survey position. ✓

✓ ALWAYS REVIEW 651

ITEM INVESTIGATION-N21 ✓

Item: 19876.0S

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'08.622"	122°13'22.588"	
Positioned By:	DGPS		
Method of Investigation:	Drift search over scaled SSS position.		
Findings:	A 1.9 m high obstruction. Least depth: 25 ft (4 fathoms)		

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: ~~Chart obstruction with least depth known at 47°59'08.622" N 122°13'22.588" W. Do not chart, surrounding depths are shallower. Chart current survey soundings. Do not correct~~

..... Compilation Use Only chart 25 ft obstn at Applied survey location. ✓

✓ ANOIS REVIEW EJS

ITEM INVESTIGATION-N22 ✓

Item: 19897.2S

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'08.099"	122°13'16.690"	22908.1

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: A 2.4 m high obstruction.

Least depth: 27 ft (4.7 fathoms) based on approved tides.

* An obstruction covered 24 ft at MLW based on approved tides was found at position 22915.1 (DN016) at latitude 47/59/07.417^N, longitude 122/13/16.506^W. See charting recommendation below.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: ~~Chart obstruction with least depth known at 47°59'08.099" N, 122°13'16.690" W. Do not chart, surrounding survey depths are shallower. Chart current survey depths. Concur, *chart~~

.....
Compilation Use Only

Chart

24 ft obstn at
Applied survey location.

✓ AWOIS REVIEW EJS

ITEM INVESTIGATION-N23 ✓

Item: 19826.5P

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'05.600"	122°13'17.964"	22980.8

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: A 2.3 m high obstruction
Least depth: 30 ft (5 fathoms)
See below for final reduced sounding value based on approved tides.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: Chart obstruction with least depth known
47°59'05.600" N, 122°13'17.964" W. Concur ✓
Chart 29 ft obstr at above position.

.....Compilation Use Only

Chart

Applied

✓ Always REVIEW EJS

ITEM INVESTIGATION-N24 ✓

Item: 17693.7S

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'14.951"	122°13'06.090"	23016.0
Positioned By:	DGPS		
Method of Investigation:	Drift search over scaled SSS position.		
Findings:	A 3.4 m high obstruction. Least depth: 18 ft (3 fathoms)		

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: ~~Chart obstruction with a least depth known, at 47°59'14.951" N, 122°13'06.090" W. Do not chart, item is in log storage area and near shore. - CONCUR ✓~~

.....
Compilation Use Only

Chart

Applied

✓ ALWAYS REVIEW 851

ITEM INVESTIGATION-N25

Item: 19811.0P

DN: 016

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'15.942"	122°13'08.993"	23036.5
Positioned By:	DGPS		
Method of Investigation:	Drift search over scaled SSS position.		
Findings:	1.7 m high obstruction Least depth : 26 ft (4.3 fathoms)		

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: ~~Chart obstruction with least depth known, 26 ft, at 47°59'15.942" N 122°13'08.993" W. Do not chart shoaler depths are in area. Chart current survey depths. Concur~~ ✓

.....
Completion Use Only

Chart

Applied

✓ Avois REVIEW

ITEM INVESTIGATION-N26 ✓

Item: 1057.05S

DN: 019

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A 353 ✓ EMB		
Observed:	47°58'53. ³⁵³ 535 "	122°13'56.165"	23808.0

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: A 1 m rise in bottom depth.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: Chart sounding of 43 ft at
47°58'53.³⁵³~~535~~" N, 122°13'56.165" W
CONCUR ✓

.....Compilation Use Only

Chart

Applied

ITEM INVESTIGATION-N27 ✓

Item: 17575.5P

DN: 019

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 58' 56.641"	122° 13' 29.365"	23850.0
Positioned By:	DGPS		
Method of Investigation:	Drift search over scaled SSS position.		
Findings:	A 1.0 m high obstruction Least depth: 29 ft (4.8 fathoms)		

.....
DIVING INVESTIGATION

N/A

.....
Charting Recommendations: ~~Chart obstruction with least depth known,~~
~~at 47° 58' 56.641" N, 122° 13' 29.365" W. Do not chart~~
~~item is near 30' GCR contour. Chart current survey~~
~~depths.~~ CONCUR ✓ ✓

.....
Compilation Use Only

Chart

Applied

ITEM INVESTIGATION-N28 ✓

Item: 19838.1S

DN: 019

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 00.1"	122° 13' 29.5"	N/A

Positioned By: DGPS

Method of Investigation: Drift search over scaled SSS position.

Findings: PHP WAS UNABLE TO REACH the item. Log boom covered the area.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: Do not chart, item is within log boom area. CONCUR ✓✓

.....Compilation Use Only

Chart

Applied

ITEM INVESTIGATION-N29 ✓

Item: 19869.6S

DN: 019

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 03.5"	122° 13' 24.6"	N/A
Positioned By:	DGPS		
Method of Investigation: Drift search over scaled SSS position.			
Findings: PHP WAS UNABLE TO REACH THE ITEM. LOG BOOM WERE OVER THE POSITION OF THE ITEM.			
.....			
DIVING INVESTIGATION			
N/A			
.....			
Charting Recommendations: Do not chart, item is within log boom area. correct ✓✓			
.....			
.....Compilation Use Only			
<u>Chart</u>		<u>Applied</u>	

ITEM INVESTIGATION-N30 ✓

Item: 19881.4P

DN: 030

Chart(s): 18444, 18443

VN: 0651

Description: SSS CONTACT

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		23867.1
Observed:	47°59'13.536" DGPS	122°13'20.082"	23876.0
Positioned By:	Drift Search		
Method of Investigation:	Drift Search over SSS position		

Findings: A 1.4 m high obstruction
with least depth of ~~34 ft (6 fathoms)~~
27 ft (4.5 fathoms).

.....
DIVING INVESTIGATION

Charting Recommendations: ~~Chart obstruction with least depth known.~~
Do NOT Chart item is within log boom
area. CONCUR ✓

.....Compilation Use Only

Chart

Applied

ITEM INVESTIGATION-N30¹ ✓

Item: 19834.0S

DN: 019

Charts(s): 18444, 18443

VN: 0651

Description: SSS contact

Source: H-10662, OPR-N267-PHP

.....
GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47°59'03.1"	122°13'26.1"	N/A
Positioned By:	DGPS		

Method of Investigation: Drift search over scaled SSS position.

Findings: DHP WAS unable to reach the items position. Log boom covered the area on DN 019.

.....
DIVING INVESTIGATION

N/A

Charting Recommendations: Do not chart item was in log boom AREA. correct ✓ ✓

.....Compilation Use Only

Chart

Applied

ITEM INVESTIGATION-N32 ✓

Item: 19868.4P

DN: 030

Chart(s): 18444, 18443

VN: 0651

Description: SSS Contact

Source: H-10662, DPR-N267-PHP

GEOGRAPHIC POSITION

	Latitude	Longitude	Position #
Charted:	N/A		
Observed:	47° 59' 03.686"	122° 13' 30.080	23876.0
Positioned By:	DGPS		
Method of Investigation:	Drift Search over SSS position		
Findings:	PHP located an obstruction 3.5 m high with a least depth of 17 ft (3.8 fathoms) 16 ft		

DIVING INVESTIGATION

Charting Recommendations: ~~Chart an obstruction with a least depth known.~~ Do not chart item is within log boom area. Do not concur —
 Chart 16 ft obstn at survey position as shown on smooth sheet, Applied

.....Compilation Use Only
 Chart Applied

U.S. Department
of Transportation
United States
Coast Guard



Commander
Thirteenth Coast Guard District

915 Second Avenue
Seattle, WA 98174-1067
Staff Symbol: (oan)
Phone: (206) 220-7270

16500
February 8, 1996

*Kaplan
FBI*

Mr. Brian Applebury
Chief, Operations Division
Seattle District Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-2255

Dear Mr. Applebury:

At our request the National Oceanographic and Atmospheric Administration (NOAA) recently completed a survey of the Snohomish River entrance channel adjacent to the new Everett Navy Base. Results of the survey indicate that the Navy's recently constructed Pier "B" is located in such a position as to pose an interference to navigation using the existing Corps designated and maintained channel.

During construction activities at the Base we have temporarily discontinued the entrance range. The Navy, Port of Everett, and Puget Sound Pilots all have indicated a desire to have the range reestablished upon completion of construction activities. However, the proximity of the existing channel to the new pier will not allow us to safely mark this channel with an entrance range.

For safe navigation into the Snohomish River, we recommend the entrance channel be realigned to the west to provide sufficient clearance for vessels to pass the new pier. Realignment of the channel will allow us to mark the centerline with an effective entrance range which will provide for safe passage past the pier.

Please advise us of your intentions in this matter. If you have any questions or need additional information, my point of contact is John Mikesell who can be reached at (206) 220-7272.

Sincerely,

G. F. Greene
G. F. GREENE
Commander, U. S. Coast Guard
Chief, Aids to Navigation &
Waterways Management Branch
By direction of the District Commander

Encl: (1) Copy, NOAA Survey Report, OPR-N267-PHP

Copy: NOAA, Rick Fletcher



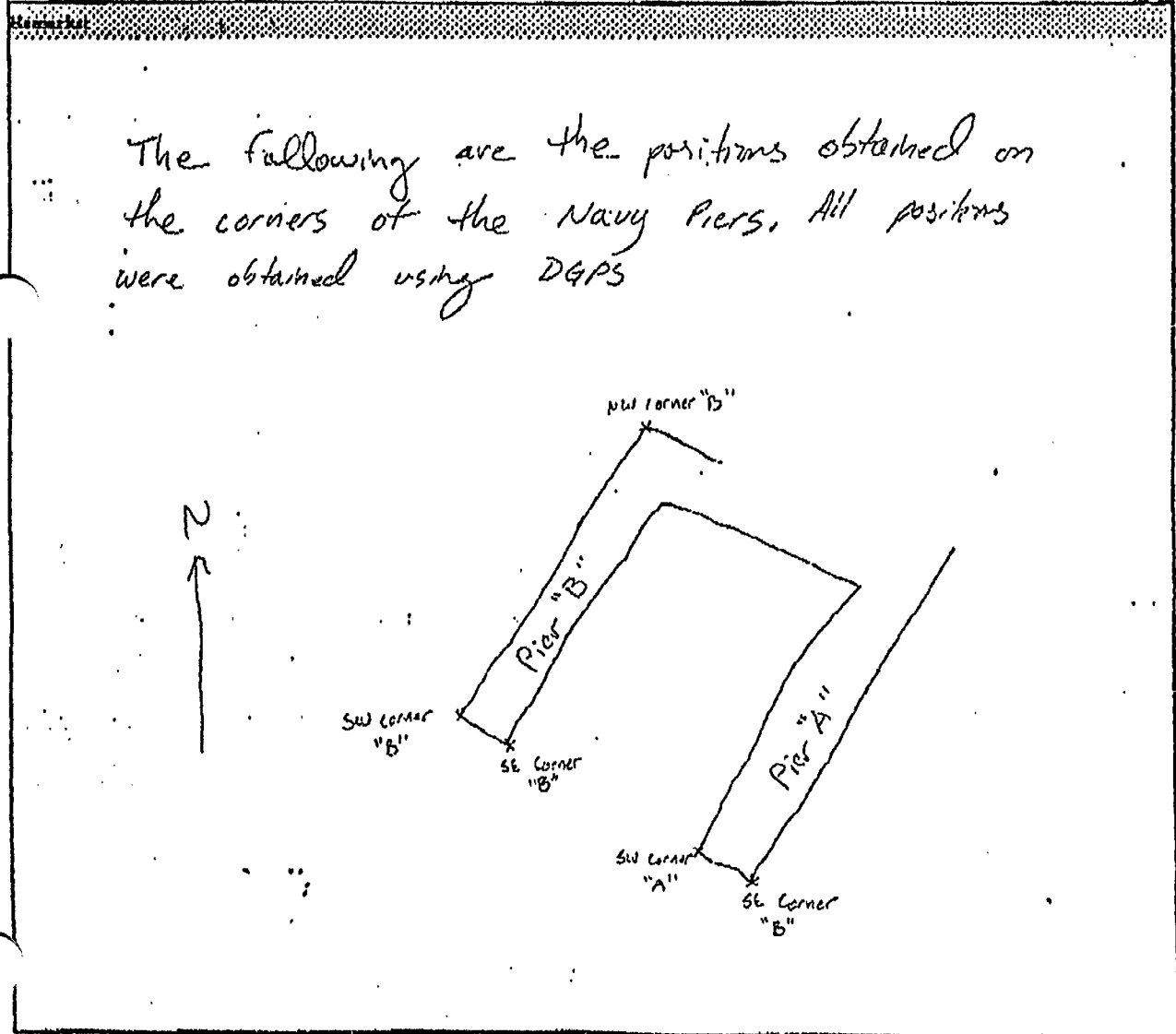
Pacific Hydrographic Party, NOAA
Tenant Activity
2070 West Marine View Drive
Everett, WA. 98207-5000

FAX

Herb Metzger

LT Rick Fletcher

Date:
Number of Pages:
Phone: 206-252-7688
Fax: 206-259-3744



LIST OF HORIZONTAL POSITIONS TO ACCOMPANY
HYDROGRAPHIC SURVEY H-10662

OPR-N267-PHP

PORT GARDNER, EVERETT, WA
PIER LOCATIONS FOR NAVAL STATION EVERETT

The following horizontal positions were attained by the Pacific Hydrographic Party during the course of hydrographic data acquisition for survey H-10662. Two horizontal positions were attained on each of the preceding objects with the exception of the SE corner of Pier "B". The inverse between the two positions is given for reference only. The two positions were then averaged for a final position.

Station	DN	FEX	HDOP	Latitude	Longitude	Inverse
NW corner Pier "B"	011	22295	1.6	047°59'05.033"N	122°13'48.445"W	
NW corner Pier "B"	349	19759	1.2	047°59'05.73"N	122°13'48.372"W	<u>4.581 m</u>
NW corner Pier "B"				047°59'05.03"N	122°13'48.409"W	
SW corner Pier "B"	011	22294	1.5	047°58'53.700"N	122°14'01.180"W	
SW corner Pier "B"	349	19758	3.1	047°58'53.509"N	122°14'01.325"W	<u>6.621 m</u>
SW corner Pier "B"				047°58'53.605"N	122°14'01.253"W	
SE corner Pier "B"	349	19757	3.1	047°58'53.075"N	122°14'00.091"W	
SW corner Pier "A"	011	22297	2.9	047°58'49.127"N	122°13'52.212"W	
SW corner Pier "A"	349	19756	1.2	047°58'49.085"N	122°13'52.222"W	<u>1.313 m</u>
SW corner Pier "A"				047°58'49.106"N	122°13'52.217"W	
SE corner Pier "A"	011	22298	2.9	047°58'48.437"N	122°13'50.713"W	
SE corner Pier "A"	349	19755	1.2	047°58'48.492"N	122°13'50.669"W	<u>1.928 m</u>
SE corner Pier "A"				047°58'48.465"N	122°13'50.691"W	

APPROVAL SHEET

for


SURVEY H-10662

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1995. The data were reviewed daily during acquisition and processing.

New procedures for processing of shoreline data were developed and used by PHP. This new procedure provides both corrected chartlets at the scale of the survey Digital Exchange Format (DXF) files that can be directly loaded into AUTOCAD for final verification and processing of shoreline data.

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.

Approved and forwarded,



Lieutenant Richard A. Fletcher, NOAA
Chief, Pacific Hydrographic Party



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Rockville, Maryland 20852

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: April 29, 1996

ORIGINAL

MARINE CENTER: Pacific

HYDROGRAPHIC PROJECT: OPR-N267-PHP

HYDROGRAPHIC SHEET: H-10662

LOCALITY: Washington, Possession Sound, Everett

TIME PERIOD: November 20, 1995 - January 30, 1996

TIDE STATION USED: 944-7659 Everett, Wa.
Lat. 47° 58.6'N Lon. 122° 13.6'W

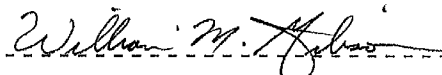
PLANE OF REFERENCE (MEAN LOWER LOW WATER): -0.44 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 10.2 ft.

REMARKS: RECOMMENDED ZONING

Times and heights are direct using Everett, Wa. (944-7659).

Note: Times are tabulated in Greenwich Mean Time.


CHIEF, DATUMS SECTION



NOAA FORM 76-155 (11-72)		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION					SURVEY NUMBER				
GEOGRAPHIC NAMES						H-10662					
Name on Survey	<small> ON CHART NO. 18444, 18443, 18423 B ON PREVIOUS SURVEY C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K </small>										
	A	B	C	D	E	F	G	H	K		
EAST WATERWAY	X		X								1
EVERETT	X		X								2
GARDNER, PORT (bay)	X		X								3
JETTY ISLAND	X		X								4
POSSESSION SOUND	X		X								5
WASHINGTON (title)	X		X								6
											7
											8
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Approved

Justin E. Long
Chief Geographer

JUN 28 1996

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER	
HYDROGRAPHIC SURVEY STATISTICS				H-10662	
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.					
RECORD DESCRIPTION		AMOUNT		RECORD DESCRIPTION	
SMOOTH SHEET		1		SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT		1		FIELD SHEETS AND OTHER OVERLAYS	
DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	3				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					
SHORELINE DATA					
SHORELINE MAPS (List):		NA			
PHOTOBATHYMETRIC MAPS (List):		NA			
NOTES TO THE HYDROGRAPHER (List):		NA			
SPECIAL REPORTS (List):		NA			
NAUTICAL CHARTS (List): Chart 18444 13th ED, August 31,1991					
OFFICE PROCESSING ACTIVITIES <i>The following statistics will be submitted with the cartographer's report on the survey</i>					
PROCESSING ACTIVITY			AMOUNTS		
			VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET					
POSITIONS REVISED					
SOUNDINGS 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			90		90
COMPARISON WITH PRIOR SURVEYS AND CHARTS					
EVALUATION OF SIDE SCAN SONAR RECORDS					
EVALUATION OF WIRE DRAGS AND SWEEPS					
EVALUATION REPORT				40	40
GEOGRAPHIC NAMES					
OTHER*					
*USE OTHER SIDE OF FORM FOR REMARKS			90	40	130
Pre-processing Examination by J. Stringham			Beginning Date 3/14/96	Ending Date 3/22/96	
Verification of Field Data by B. Mihallov, J. Stringham, D. Doles			Time (Hours) 90.00	Ending Date 5/14/96	
Verification Check by B. Olmstead, R. Fletcher			Time (Hours) 3	Ending Date 12/19/96	
Evaluation and Analysis by B. Mihallov			Time (Hours) 40.00	Ending Date 10/15/96	
Inspection by B.A. Olmstead, R. Fletcher			Time (Hours) 5	Ending Date 12/20/96	

**EVALUATION REPORT
H-10662**

A. PROJECT

The hydrographer's report contains a complete discussion of the Project information.

B. AREA SURVEYED

Discussion of the survey area is adequately discussed in the hydrographer's report. Refer to the chartlet attached to this report for a diagram of the survey area. The bottom is made up of mainly sand and mud. Depths Range from 0 to 452 feet.

C. SURVEY VESSELS

The hydrographer's report contains information relating to survey vessels.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer; the Hydrographic Processing System (HPS) and AutoCad, Versions 12 and 13.

At the time of the survey certification the format for the transmission of digital data had not been finally approved. In the interim, digital data for this survey exists in the standard HPS format which is a database format using the .dbf extension. In addition, the sounding plot, created with the .dbf data and enhanced using the AutoCad system, is filed both in the AutoCad drawing format, i.e., .dwg; and in the more universally recognized graphics transfer format, .dxf. Copies of these data files will be retained at PHB until data transfer protocols are developed and approved.

The drawing files necessarily contain information which is not part of the HPS data set such as geographic name text, line-type, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes, remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guidelines No. 75 and No. 35.

The field sheet parameters have been revised to center the hydrography on the office plot. Data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

Discussion of side scan sonar equipment is adequately discussed in the hydrographer's report.

F. SOUNDING EQUIPMENT

Sounding equipment is discussed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

The sounding data have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for actual tide, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with present NOS specifications. Actual tide reduction is derived from Everett, Washington gage (944-7659).

H. CONTROL STATIONS

Sections H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of the horizontal control stations used during hydrography are published values based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with NGS program NADCON.

Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections.

Latitude: -0.609 seconds (-18.806 meters)
Longitude: 4.520 seconds (92.801 meters)

The year of establishment of control station originates with the horizontal control records for this survey.

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS(DGPS) was used to control this survey. There are a few positions where the maximum allowable horizontal dilution of precision (HDOP) limits have been exceeded during this survey. A review of the data, however, shows that the positioning of soundings located by these fixes is consistent with the surrounding information and is considered acceptable. None of these survey positions are used to locate dangers to navigation. Daily DGPS performance checks were conducted in the field and found adequate.

J. SHORELINE

Shoreline drawn on the smooth sheet originates with Chart 18444, 13th Edition, August 31, 1991. Shoreline originating with the chart is drawn in brown on the smooth sheet for orientation purposes only.

The shoreline from the above sources have been digitized during office processing and merged with the survey file during ACAD processing. Changes to alongshore and offshore features shown on the shoreline maps were verified and revised as warranted during survey operations. These changes have been shown on the smooth sheet.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

No contemporary surveys junction with H-10662.

M. COMPARISON WITH PRIOR SURVEYS

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-8173	(1954)	1:5,000
H-8174	(1954)	1:10,000
H-8754	(1963-66)	1:10,000

Surveys H-8173 and H-8174 cover the entire survey area. Numerous shoreline changes have occurred since 1954. The Snohomish River was dredged in 1995 which increased depths within the mouth of the river. Sounding comparison reveals differences of 2 to 3 feet except in areas where dredging has occurred and additional pier construction has taken place.

Survey H-8754 covers the offshore area common to survey H-10662. Sounding comparison was generally within 3 to 9 feet in well over 100 feet of water.

H-10662 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There are 15 AWOIS items within the survey area. They are adequately addressed in the hydrographer's report, section N.

O. COMPARISON WITH CHART

Survey H-10662 was compared with the following charts.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
18443	14th	March 24, 1990	1:40,000	NAD 83
18444	13th	August 31, 1991	1:10,000	NAD 83

a. Hydrography

Charted hydrography originates with the prior surveys and miscellaneous sources which requires no further discussions.

The charted hydrography is in satisfactory agreement with survey H-10662. However, due to the intensity of developments on the present survey, some least depths were found to be generally shoaler and few more significant features were located. Further information concerning other discrepancies noted during this survey is included in section O of the hydrographer's report.

The following depths were not adequately investigated and should be retained as charted.

<u>Feature</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
34 ft 1982	47/59/18	122/13/14
26 ft 1982	47/59/18	122/13/12
35 ft rep	47/58/45	122/13/24

A post dredge survey contracted by the Port of Everett in April 1995 found depths of 39-45 feet on the south side of Pier 1 charted at latitude 47/58/43N, longitude 122/13/24W. Recommend the note "35 ft rep 1974" charted at latitude 47/58/43N, longitude 122/13/24W be revised to "39 ft rep 1995". A copy of the post dredge survey has been forward to N/CS3x1.

With the exception of the above mentioned depths, survey H-10662 is adequate to supersede charted hydrography within the common area of coverage.

b. Dangers to Navigation

One danger to navigation was reported during survey operations to the USCG, DMAHTC and N/CS 261 on February 8, 1996. One additional danger to navigation was found and reported during office processing. Copies of these reports are attached.

P. ADEQUACY OF SURVEY

With the exceptions noted above, hydrography is adequate:

- a. delineate the bottom configuration, determine least depth, and draw the standard curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigations; and
- c. show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1994 Edition.

Q. AIDS TO NAVIGATION

There are two fixed and fourteen privately maintained aids to navigation located during survey operations. There are four floating aids to navigation within the survey limits. These aids were adequately located during survey operations and serve their intended purpose. See section Q of the hydrographer's report concerning Buoy "AO".

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS


Miscellaneous information is found in the hydrographer's report. There were no additional items noted during office processing.

T. RECOMMENDATIONS

This is an good hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS

Referral to reports is discussed in the hydrographer's report.


Bob Mihailov/
Cartographer

APPROVAL SHEET
H-10662

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead Date: 12/31/96
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
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 Evaluation Report.

Kathy Timmons Date: 12/31/96
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:
Andrew A. Armstrong III Date: Apr 3, 1997
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

