

H10583

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

Type of Survey ..... Navigable Area Survey (NAS)  
Field No. .... PHP-10-6-94  
Registry No. .... H-10583

### LOCALITY

State ..... Washington  
General Locality ..... Strait of Juan de Fuca  
Sublocality ..... Approaches to Port Angeles Harbor

19 95

CHIEF OF PARTY  
LT Richard A. Fletcher, NOAA

### LIBRARY & ARCHIVES

DATE ..... MAY 30 1996

## HYDROGRAPHIC TITLE SHEET

H-10583

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-10-6-94

State Washington

General locality Strait of Juan de Fuca

Locality Approaches to Port Angeles Harbor

Scale 1:10,000 Date of survey Nov. 30, 1994 - Jan. 26, 1995

Instructions dated May 17, 1994 Project No. OPR-N251-PHP

Vessel Jensen Launch 1101 (0651), MonArk Launch 1102 (0652)

Chief of party LT Richard A. Fletcher, NOAA

Surveyed by LT R. Fletcher, ST R.W. Adams, ST L.K. Simmons, ET E.O. Wernicke

Soundings taken by Side Scan echo sounder, ~~DSF-6000N~~ DSF-6000N, Innerspace 448, EG&G Model 260

Graphic record scaled by PHP Personnel

Graphic record checked by PHP Personnel

Evaluated by: L. Deodato Automated plot by HP Design Jet 650C

~~Plotted by xx~~

Verification by J. Stringham, D. Doles, R. Mihailov, L. Deodato

Soundings in Meters & Decimeters at 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.

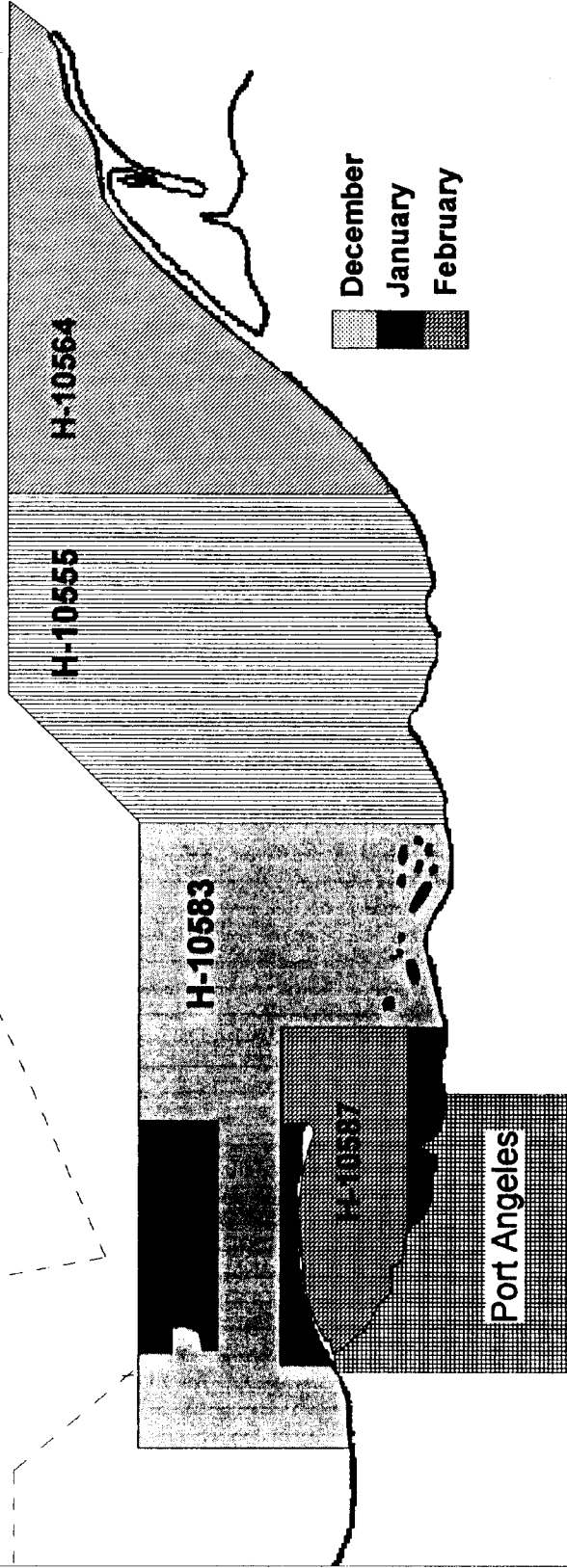
MAY 30 1996

Awois Check  
5/13/96

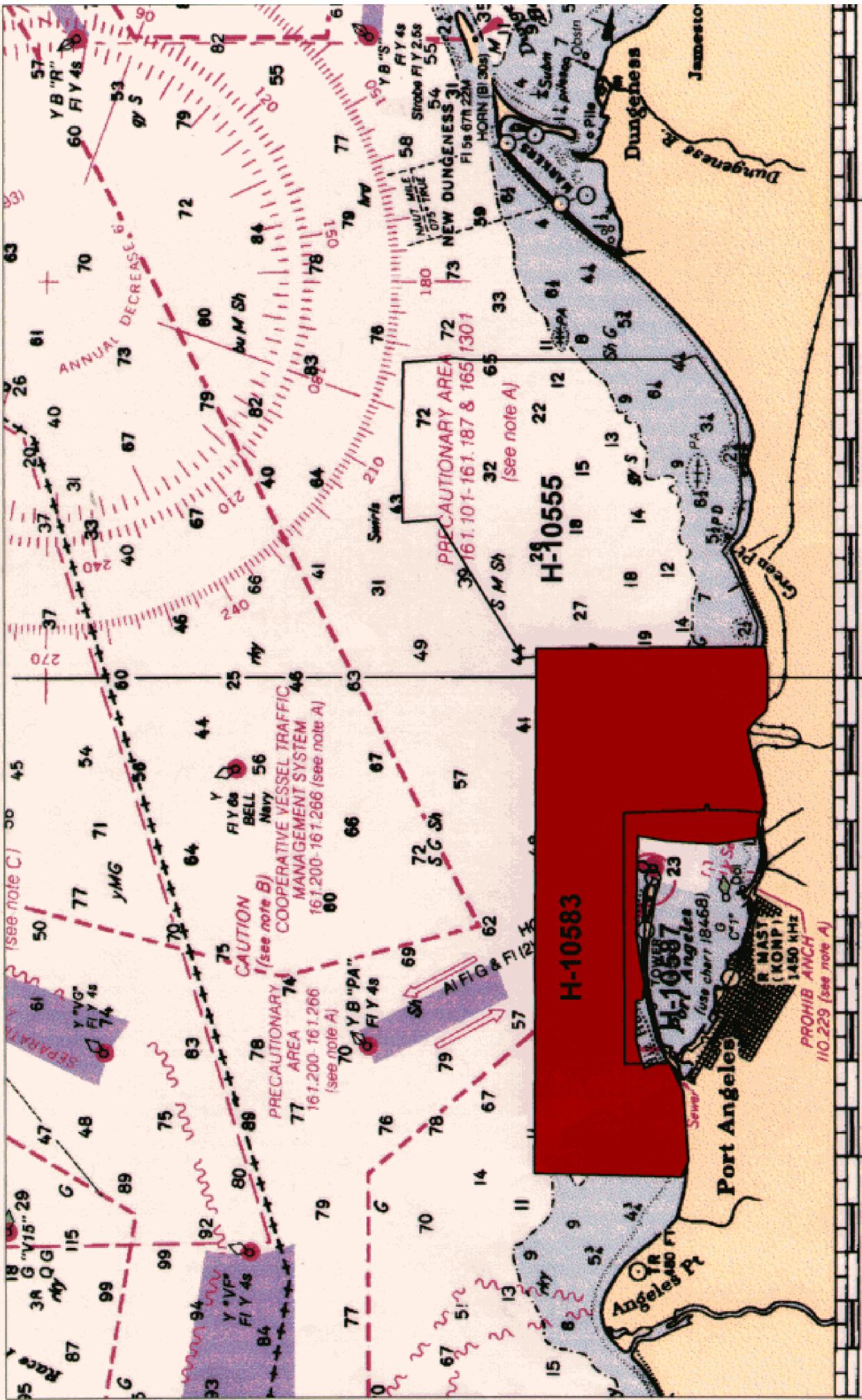
**PROJECT LIMITS & SHEET LAYOUT**  
**OPR-N251-PHP**  
 Port Angeles, Washington

Reg. #	Commenced	% Complete	Completed	Submitted
H-10555	25-Jul-94	100%	21-Nov-94	28-Nov-94
H-10564	24-Aug-94	100%	6-Dec-94	7-Dec-94
H-10583	30-Nov-94	100%	26-Jan-95	24-Feb-95
H-10587	20-Dec-94	75%		
Down Time:	Weather	Electronics	Mechanical	GPS
	0	0.5	0	0

Precautionary Area



TYPE	July	August	September	October	November	December	January	February
Sq NM	0.15	8	8	6	4	6	2	3
SV Casts	0	4	1	1	1	2	3	2
LNM Hydro	0	284.2	170.8	142.2	158.7	203.4	147.4	102
LNM SSS	11	49.4	101.2	88.5	94.8	68.8	26.9	92.8
DP							1	67
Drives							0	4
BS	0	0	0	0	46	0	5	0



10'

20'

12330'

**Descriptive Report to Accompany Hydrographic Survey H-10583**

Field Number PHP 10-6-94

Scale 1:10,000

1994

Pacific Hydrographic Party

Chief of Party: LT Richard A. Fletcher

**A. PROJECT ✓**

This navigable area survey was conducted in accordance with Hydrographic Project Instructions OPR-N251-PHP, Port Angeles, Washington, issued March 17, 1994.

The project was authorized in response to requests from the Puget Sound Pilots, the Port of Port Angeles, the City of Port Angeles and local commercial enterprises. The primary objectives of the project are to update the charted hydrography which dates from 1892 to 1974, to investigate reported wrecks and other submerged features and to resolve discrepancies between charted and existing cultural features.

The Port of Port Angeles is regularly used by large vessels for refueling, awaiting orders or tugs and as a harbor of refuge when weatherbound. Docks are available with alongside depths up to 45 feet. Commercial activities include oil handling and bunkering, liquid bulk handling (caustic soda, chlorine, etc.), dry bulk general cargo handling (logs, lumber, wood chips, pulp, limestone, etc.), and general cargo handling that includes seafood. Approximately 500 berths at the Port Angeles Boat Haven marina accommodate fishing vessels and pleasure craft. Ferry service between Port Angeles and Victoria, B.C., is also available.

This survey's sheet letter is "B" as specified by the project instructions and it is the third survey for Project OPR-N251-PHP.

**B. AREA SURVEYED ✓** *See Eval Report, Section B.*

The area surveyed for H-10583 extends from longitude 123°30'00.0"W, east to longitude 123°19'20"W. North limit is latitude 48°10'00.0"N and the South limit is the 5-meter curve near shore or the north extent of Sheet A at latitude 48°08'40.0"N. The east and west junctions with Sheet A are longitude 123°23'00.0"W and longitude 123°28'00.0"W respectively. Plotter sheet "B" was oriented at 0° with overall sheet limits measuring 58.5 cm by 136.0 cm. Hydrographic limits for H-10583 are within those required by the Hydrographic Manual (Section 1.2.3, pp. 1-6).

Data acquisition for Sheet B hydrography was conducted from November 30, 1994, (DN 334) through January 26, 1995 (DN 026).

### C. SURVEY VESSELS ✓

NOAA Launch 1102 (EDP No. 0652), a 21-foot SeaArk, was used for mainscheme and crossline hydrography as well as for detached positions and development hydrography. NOAA Launch 1101 (EDP No. 0651), a 29-foot Jensen was used for mainscheme, crossline, side scan sonar and development hydrography as well as for bottom samples and dive operations. No changes to the standard vessel sounding configuration were necessary for either vessel.

### D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

The standard NOS HDAPS software suite was used throughout this survey. Program names and versions are listed in Appendix VI. The PHP-modified version of the Side Scan Sonar Contact Utility (CONTACT) was used. This program contains a subprogram module which "sifts" contact data with the selected sounding data stored in the Zoom Edit GRAPHDATA file. A detailed description of this program is included in Appendix VI.\*

The following non-HDAPS computer programs were used in field work for data supporting this survey:

<u>Program Name</u>	<u>Version</u>	<u>Date</u>	<u>Usage</u>
VELOCITY	2.21	1994	Sound Velocity Corrections
NADCON	1.01	1989	NAD83 to NAD27
INVERS3D	1.00	1991	Horizontal Control
MONITOR	2.00	1994	DGPS beacon check
GEOID93	1.00	1993	GPS ellipsoidal elevation

Version 5.01 of the PC-DAS SURVEY Program was used for data acquisition on VN 0652. The master printout was annotated whenever software problems affected the data.

### E. SONAR EQUIPMENT ✓

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range correcting SSS recorder and an EG&G 272T dual-channel (single frequency) towfish. The following sonar equipment was used throughout the survey:

<u>Type</u>	<u>S/N</u>
272-T Towfish	015598
260 Recorder	015602

\* Filed with the hydrographic data.

The towfish was operated on the 100 kHz frequency and was configured with a 10° beam depression. It was deployed from the starboard quarter using a lightweight, 50-meter EG&G cable passed through a block and powered by an electric winch. Block and winch were mounted to a swing-arm davit. Tape markings at measured, one-meter intervals indicated length of cable deployed from the block up to the maximum deployable of 43 meters. ✓

SSS operations were conducted at a speed of 5 knots or slower, using range scales of 75, 100 and 150 meters. The SSS towfish was maintained at a height off the bottom equivalent to 8 to 20 percent of the range scale except where depths exceeded the limits of the cable within the allowable range scales. In such cases, the hydrographer believes the resolution of the sonargram is adequate for identification of any significant contacts. ✓ Line spacing was close enough to achieve 100% coverage despite the reduced swath widths when range scale was exceeded.

In accordance with Section 7.3 of project instructions, 100 percent side scan coverage was acquired from the 22-fathom curve shoreward to the 5-meter curve or the limit of prudent surveying with side scan sonar. Experience with strong cross-currents during the first two surveys in this project resulted in significant degradation of sonargrams as well as inaccuracies in computed contact positions. ✓ In order to minimize these distortions, SSS lines were oriented East-West with the current and along the contours. The result was no significant degraded swath range on this survey.

The SSS recorder gain was adjusted for the best return for the prevalent bottom material. Contacts or identifiable features (e.g., anchor scours, change in bottom texture) visible on the outer edge of the sonargram assure acceptable SSS recorder tuning and served as confidence checks during operations. ✓ Because opening and closing the EG&G door caused sonargram distortion, such on-line annotations were kept to a minimum.

Following the guidelines in Section 7.3.2 of the Project Instructions, sonargrams were manually scanned for significant contacts; these were labeled and entered into 31 HDAPS contact tables. Where clumps of contacts appeared on the sonargram, only the most significant were entered. ✓ Apparent significance was determined with the PHP-developed Contact-O-Meter, a scale proportioned for shadow length and fish height. Contact heights and raw depths were derived using the HDAPS Side Scan Utility Program.

The HDAPS "sift" function was employed to identify significant contacts requiring further investigation; i.e., significance determined by comparison with surrounding sounding data. ✓ The

program logic is based on the guidelines for developing groups of contacts as specified in Section 7.3.2 of the Project Instructions. User input parameters include navigationally hazardous depth threshold and radius for sounding comparisons.

Chart 18465 is currently published at a scale of 1:80,000. Sifting at that scale (chartable radius of 264 meters) produced no significant contacts even before development. Nevertheless, anticipating the possibility that a larger scale chart of the area would eventually be produced, contacts were sifted at a scale of 1:20,000 (chartable radius of 66 meters). All significant contacts were re-evaluated by reviewing the sonargram together with the sifter printout. Because of the total number of contacts with heights greater than or equal to one meter, contacts selected for development fell into one of the two following categories:

Contacts with computed heights greater than 1.5 meters - unless the sonargram indicated a larger target than computed. More often than not, actual height is somewhat less than computed height. In some cases it is not. Such determinations are based on experience and familiarity with the survey.

Contacts with offsets greater than 10 meters (with some exceptions). Since computed heights of contacts close to the fish tend to be substantially exaggerated, most contacts with offsets of 10 meters or less could be eliminated. Some did appear to be significant, however, and were selected for development.

In all, 139 contacts were developed.

Following these developments, contacts were resifted at 1:40,000 (chartable radius of 132 meters). Of the undeveloped significant contacts still remaining, all but three were 10 meters or less from the towfish. One of the three (286.04P) is 15 meters from the fish and the computed height appears to be exaggerated. The second (180.69P) produced a weak return on the sonargram and does not appear to be significant. The third (2019.55P), with a computed top depth of 6.2 meters, lies in a rocky area very close to shore. A 6.5 meter (Pos. No. 1006+5, DN 348, VN 0651) sounding is offshore to the northeast; and a 5.7 meter sounding (Pos. No. 5692+2, DN 025, VN 0652) lies 600 meters north and 800 meters west of the contact at latitude 48°07'20.632"N, longitude 123°20'03.958"W.

A final sifting at 1:20,000 (chartable radius 66 meters) produced 68 significant contacts. Of these, 12 were 10 meters or less from the towfish; one had already been developed; 36 had computed heights of 1.5 meters or less. The sonargram trace of the remaining 17 was re-examined and 12 more were



eliminated either because the return was weak or it was apparent, based on experience, that the height of the actual contact would not be significant. Five remained which could not be eliminated. All are in the rocky area inside the 10-meter curve; four are within 500 meters of shore and well inshore of the 5.7-meter sounding (Pos. No. 5692+2, DN 025, VN 0652) located at latitude 48°07'20.632"N, longitude 123°20'03.958"W. The fifth, with a computed height of 1.9 meters and a top depth of 6.2 meters, is also well inside the 10-meter curve and only 30 meters offshore of a 6.7-meter sounding (Pos. No. 3015+2, DN 026, VN 0651).

*Lat = 48/07/11.501 N*  
*Lon = 123/22/14.60 W*  
The hydrographer is satisfied that contact development was adequate to identify significant obstructions for charting purposes.

Contact tables and final sifting printouts are included in Separate V.\*

#### F. SOUNDING EQUIPMENT

Innerspace Model 448 (IN-448) single frequency echosounder, Serial Number 239, modified with custom EPROMS for HDAPS, was used on Vessel No. 0652 from DN 341 to DN 026.

Raytheon, dual-frequency, Digital Sounding Fathometer (DSF) 6000N, Serial Number A124N, was used on Vessel No. 0651.

The high-frequency beam was selected for plotting throughout the survey. The low-frequency depth was scanned and edited only when the high frequency did not track the bottom or when a more significant depth was acquired with the low-frequency beam.

Soundings were recorded in meters with an assumed speed-of-sound through water of 1500 m/sec. Depths encountered in the survey area range from 2.1 meters (Pos. No. 5863+6, DN 026) to 128.7 meters (Pos. No. 762, DN 347) based on predicted tides.

Occasional breaks in the continuity of the echogram occurred when rapid changes in range scale were required. The hydrographer does not consider these breaks significant unless greater than 6mm at the survey scale (Section 1.4.6, Hydrographic Manual) or if they occurred over a shoaling trend (potential missed peak), in the event of which the section or line was resurveyed. *Data was analyzed during office processing and found to contain no significant problems.*

Metric leadlines were used for depth comparisons with the echosounder and for least depths on Items N1 and N2. PHP fabricated the leadlines following Hydrographic Survey Guideline (HSG) 69. Each leadline is 1/4-inch steering tiller

*\* Filed with the hydrographic data.*

rope. Shrink tubing, secured with epoxy glue, marks one-meter intervals from one to thirty. With the line under six pounds of constant tension, markings were calibrated with a steel surveyor's tape. The throwing end is a standard six-pound lead weight shackled to a stainless steel thimble bent to the bitter end. Leadline calibration forms are included in Separate IV (Sounding Equipment Calibration and Corrections).\*

As described in Section E above, side scan hydrography was conducted along the contours. For the sake of expediency, it was elected to conduct echosounder hydrography along the contours as well. This decision proved to be problematic; cross-contour soundings were insufficient for contouring. Additional crosslines were necessary, to enable complete contouring, particularly across the shoal on the west end of the sheet.

#### G. CORRECTIONS TO SOUNDINGS *See Eval Rpt., Section G.*

##### Velocity of Sound

Corrections for the speed of sound through the water column were computed from data obtained with an Applied Microsystems Laboratories (AML) Velocity of Sound Profiler (S/N 03004). The VELOCITY Program was used to determine the speed of sound correctors. The following casts were used to determine the velocity correctors:

HDAPS Table	DN	DN Range	Extrapolated Depth	Latitude	Cast Position Longitude
11	314	314-339	166.7m	48°11'05"N	123°14'05"W
12	340	340-353	168.7m	48°11'04"N	123°13'03"W
13	354	354-004	158.1m	48°09'40"N	123°28'20"W
14	005	005-016	160.2m	48°09'42"N	123°28'18"W
15	017	017-026	121.7m	48°10'00"N	123°25'00"W

Separate IV\* contains copies of all velocity cast data and HDAPS Velocity Corrector Tables. *Casts 11, 12, and 15 plot outside the survey limits.*

The AML instrument was calibrated by Northwest Regional Calibration Center on April 15, 1994 (DN 105). A copy of this calibration report is included in Separate IV.\*

##### Leadline Comparisons ✓

Leadline comparisons were taken on most days of hydrography to confirm proper digitization of the echosounder depth. These are annotated on the echograms; no systematic drift or error was observed.

*\* Filed with the hydrographic data.*

### Static Draft ✓

Static draft for VN 0652 was determined on April 12, 1994 (DN 102). First, the depth of the transducer face from a reference mark on the hull was measured. Next, with the launch in the water (fuel tanks half full and two crewmen aboard) the depth from this reference mark to the waterline was measured. Combining the two measurements, a static draft of 0.4 meters was calculated.

A static draft of 0.5 meters was determined for VN 0651 on May 3, 1994, (DN 124) using a method similar to above.

### Dynamic Draft ✓

Settlement and squat measurements for VN 0652 were conducted on April 5, 1994, (DN 095) in Guemes Channel at Pier 1 in Anacortes, WA. Settlement and squat measurements for VN 0651 were conducted on May 4, 1994, (DN 124) at the same location. Field records are included in Separate IV.\*

Settlement and squat correctors are applied on line to all survey data via the HDAPS Offset Tables.\* Offset Table 1 corresponds to VN 0651; Offset Table 2 corresponds to VN 0652. Settlement and squat correctors are reapplied during field processing using the REAPPLY program in HDAPS.

### Corrections to Echosoundings ✓

Echosounder misdigitization occurred on occasion when bottom topography was both very steep and very deep. Where the echogram trace was adequate and unambiguous, the digital record was corrected to reflect the analog trace. *Data was analyzed during office processing and found to contain no significant problems.* Swells of one to three meters were usual during the survey. These were annotated on the fathogram\* and scanned out during post-processing. *See statement above.*

In areas of heavy kelp, the fathogram\* was annotated accordingly, and obvious kelp spikes were edited out of the digital record. *See statement above.*

### Tide Correctors ✓

In compliance with Section 5.9 of Project Instructions, three tide zones were established for OPR-N251-PHP. Predicted tides from the existing primary station at Port Angeles, Washington, (944-4090) were applied direct to soundings during field processing of H-10583. *Tide Note dated April 6, 1995 is attached.*

*\* Filed with the hydrographic data.*

H. CONTROL STATIONS See Eval Rpt, section H.

Horizontal Datum

The horizontal control datum for this project is North American Datum of 1983 (NAD 83). A copy of the HDAPS Control Station Table is included in Appendix III\* (List of Horizontal Control Stations). A separate Horizontal Control Report OPR-N251-PHP, Port Angeles, was submitted to N/CG245 September 1994. *The HDAPS Control Station Table is attached to this report.*

I. HYDROGRAPHIC POSITION CONTROL See Eval Rpt, Section I.

Position Control

Differential GPS (DGPS) provided position control throughout this survey based on two DGPS beacons established and maintained by the Canadian Coast Guard: "Victoria" at Race Rocks, BC, and "Vancouver" at Point Atkinson, BC.

<u>Reference Station</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Ellips. Height</u>
Race Rocks	48°17'52.2582"N	123°31'54.7474"W	-6.031m
Point Atkinson	49°19'49.4018"N	123°15'52.4445"W	22.050m

Per FPM, Section 3.4.6.3, the reference sites were confirmed using the program MONITOR. A copy of the scatter plots and the outlier.sum files are included in Separate III\* (Horizontal Position Control and Corrections to Position Data).

Accuracy requirements specified in Section 4.4 of the Hydrographic Manual and Section 3.0 of the Field Procedures Manual were met.

DGPS Performance Checks ✓

Per FPM, Section 3.4.4.1, DGPS performance checks were obtained on days of hydrography using a mark at the Coast Guard pier on Ediz Hook. The mark was positioned to Third Order, Class I standards (see Horizontal Control Report). All DGPS performance checks were successful; check forms are located in the data files.\*

\* Filed with the hydrographic data.

Positioning Equipment ✓

The following GPS equipment was used:

<u>Equipment Location</u>	<u>Type of Receiver/Antenna</u>	<u>Receiver Serial No.</u>	<u>Antenna Serial No.</u>
VN 0651	Ashtech (v.1E08D) CSI Beacon Rcvr MBX1	700417B1139 X-1212	700378A0272
VN 0652	Ashtech (v.1E08D) CSI Beacon Rcvr MBX1	700417A1141 X-1211	700378B0402

The unique serial numbers for all equipment are annotated on the daily master printout.\*

**J. SHORELINE** ✓ *See Eval Rpt, Section J.*

Shoreline verification was not a requirement for this survey.

**K. CROSSLINES** ✓

Nautical miles of crossline total 40.99 (including buffer lines along the 5 and 7-meter contours), representing 14.2% of the mainscheme hydrography on H-10583. Agreement is generally good. However, in some instances, soundings from mainscheme and mainscheme splits run on different days indicate inaccuracies in predicted tides\*. This is most pronounced on the west side of the sheet. Crossline soundings support this interpretation of the data. *Crossline agreement is good after application of approved tides.*

**L. JUNCTIONS** ✓ *See Eval Report, Section L.*

H-10583 hydrography joins Survey H-10555 at the east *and H-10587 on the south.* Overlapping soundings were obtained per section 4.3.2 of the Hydrographic Manual; junction contours are well-matched and soundings agree within the prescribed limits.

**M. COMPARISON WITH PRIOR SURVEYS** *See Eval Report, Section M.*

The survey was compared cursorily with prior surveys H-9414, and H-6649. No discrepancies were noted. Pacific Hydrographic Section, N/CG245, will perform a more rigorous comparison following application of smooth tides.

\* Filed with the hydrographic data.

**N. ITEM INVESTIGATION REPORTS ✓**

Item Investigation Reports for the following developed features are included in Separate VI:\*

N1	AWOIS Item 50356
N2	AWOIS Item 52057
N3	SSS Contact 187.60S
N4	SSS Contact 70.48S
N5	7.5-fathom shoal

\* copies are attached.

**O. COMPARISON WITH THE CHART See Encl Rpt, sec O.**

Since no enlargement of Chart 18465 (1:80,000, 29th Edition, March 6, 1993) was available, soundings from the chart were scaled off, converted to meters and plotted at 1:10,000 for comparison with the survey. A fathom plot was also produced at 1:80,000 to facilitate comparison at chart scale.

**Dangers to Navigation ✓**

One danger to navigation was identified within the limits of this survey and reported to the U. S. Coast Guard 13th District, DMAHTC, and NCG221. A copy of the report is included in Separate I.\* See Section N for a detailed description of the item investigation.

\* copies are attached.

**Comparison of Soundings ✓**

With the scale of the survey reduced to the scale of the chart at 1:80,000, agreement of contours is very good. Small trends are difficult to discern. Most soundings are in good agreement with a few exceptions:

A shoal was defined with a least depth of 13.<sup>4</sup> meters (27.4<sup>3</sup> fathoms) marking the east limit at latitude 48°07'29.516"N, longitude 123°22'06.266"W (Pos. No. 153+7, DN 026, VN0651). A sounding of 14.2<sup>6</sup> meters (24.1 fathoms) marks the west limit at latitude 48°07'29.946"N, longitude 123°22'14.473"W. ✓ Charted sounding is 7.5 fathoms (13.7 meters) at latitude 48°07'30.00N, longitude 123°22'12.60"W.

A charted depth of 3 fathoms (5.5 meters) at latitude 48°07'09.00N, longitude 123°21'36.00W, was not confirmed. Surveyed least depth in the immediate vicinity of the charted ✓ sounding is 6.3 meters (3.4 fathoms) located at latitude 48°07'10.652"N, longitude 123°21'35.651"W (Pos. No. 153+7, DN 339, VN 0651). Chart 3<sup>4</sup> fathom sounding (6.1 meters) & found by this survey, depth charted 3 fms.

The charted 4.5-fathom (8.2-meter) shoal located at latitude ✓ 48°07'24.00"N, longitude 123°21'12.00"W, was developed on DN

349 (Pos. Nps. 1154-1171, VN 0651). A least depth of 9.3<sup>3</sup> meters (5.4 fathoms) was located at latitude 48°07'24.013"N, longitude 123°21'11.680"W (Pos. No. 1166+2-DN 349, VN 0651). *Chart 5 fathom sounding (9.3 meters) as found by this survey. Deleted charted 4 1/2 fms.*  
A depth of 5.25 fathoms (9.6 meters) is charted at latitude 48°07'45.00"N, longitude 123°21'04.80"W. A shoal identified by mainscheme hydrography in this vicinity was developed on DN 349 (Pos. Nos. 1138-1153) and developed further on DN 017 (Pos. 2506-2515). A least depth of 10.6 meters (5.8 fathoms) was located at latitude 48°07'43.802"N, longitude 123°21'04.162"N. *Chart 5 1/4 fathom sounding (10 meters) as found by this survey.*

The charted 5.25-fathom (9.6-meter) sounding at latitude 48°07'21.00"N, longitude 123°22'36.00"W was not confirmed. A contact at that position was developed (130.28S) and a least depth of 10.8 meters (5.8 fathoms) was located at latitude 48°07'21.048"N, longitude 123°22'41.165"W (Pos. No. 5105+7, DN 355, VN 0652). *Chart 5 1/4 fathom sounding (10 meters) as found by this survey.*

The hydrographer believes development of each of the above features was adequate and recommends charting the surveyed least depths in each case. *Concur*

*8 to 10*

A trench as deep as 12 meters extends from latitude 48°09'23.261"N, longitude 123°22'11.728"W (Pos No. 1780+1, DN 004) southwest to latitude 48°08'54.196"N, longitude 123°22'44.738"W (Pos. No. 1675+1, DN 356). This trench is not observed at the scale of the chart. *Concur*

The side scan sonargram and contact plots provide ample evidence of rocky, boulder-strewn areas inside the 20-meter contour. The hydrographer recommends plotting boulder symbols at intervals inside this contour. *The notation "Bld" has been added to the smooth sheet based on the side scan sonargram and contact plots. In addition, a note has been added to the smooth sheet to refer to this situation.*  
Comparison of Non-Sounding Features

Kelp beds exist on both the east and west ends of the survey. Buffer lines were run around both beds (Pos. Nos. 30-34 east; Pos. Nos. 1945-1952 west). Kelp symbols have been added to the smooth sheet to reflect the hydrographer's findings.

The charted pipeline is clearly evident on the sonargram. Positions along the centerline were scaled from the sonargram and calculated using the Contact Utility program (see Contact Table 40 in Separate VI)\*. A temporary buoy was positioned over the offshore end by Olympic Divers who were performing maintenance work (Pos. No. 971, DN 348, VN 0651). According to Jay Ketchum of Olympic Divers in Port Angeles, phone (360) 452-5264, the effluent originates at the Rayonnier paper plant and is emitted through several risers on the last 90 feet of pipe as well as through the end of the pipe. He described the pipe as six feet in diameter and three feet above the bottom. He confirmed a rock next to the pipe end approximately 20 feet

\* Filed with the hydrographic data.

across and 10 feet high. This is consistent with Pos. No. 1106+3 (DN 348, VN 0651). Due the lack of visibility caused by the effluent, PHP divers did not dive on the pipeline. This feature is not shown on the Smooth Sheet but was verified as existing within the charted pipeline limits. The sewer outfall from the Daishowa paper plant on the northwest shore of Ediz Hook was also visible on the sonargram and was positioned in the same manner described above. (See Separate VI.) \* Same Comment as above. Feature verified as charted.

Positions of both features were entered into Carto Table 3 (Separate VI) and plotted on the D.P. plot. Both are in agreement with the chart. Retain both features as charted.

#### P. ADEQUACY OF SURVEY ✓

This survey is a complete navigable area hydrographic survey and is adequate to supersede all prior surveys within their common areas. Furthermore, the acquisition of 100% side scan sonar coverage within the navigable waters of this survey ensures that no unknown hazards exist within its limits. *concur.* Several rocks inshore of the 2-meter curve were transferred from H-6649 (1940) to the Smooth Sheet. With this exception, the present survey is adequate to supersede all prior surveys.

#### Q. AIDS TO NAVIGATION *See Eval Report, Section Q.*

No aids to navigation, private aids or landmarks are located within the survey limits of H-10583.

#### R. STATISTICS ✓

<u>Description</u>	<u>Quantities</u>
Total Positions	3904
Total Detached Positions	4
Total Nautical Miles Hydrography	390
Square Nautical Miles Hydrography	18
Velocity Casts	5
Days of Production	25
Bottom Samples	6
Tide Stations	1

#### S. MISCELLANEOUS ✓

Bottom samples were taken in accordance with Hydrographic Manual, Sections 1.6.3 and 4.7.1. No significant changes were noted. Bottom sample positions and descriptions are plotted on the detached position plot. Copies of Oceanographic Log Sheet-M, Bottom Sediment Data, (NOAA Form 75-44) are included with hydrographic data. It was not a requirement to send bottom samples to the Smithsonian.

\* Filed with the hydrographic data.



**T. RECOMMENDATIONS ✓**

When the largest scale chart of the area is published at 1:80,000 and the survey is conducted at a scale of 1:10,000, the task of determining what is good enough and what is overkill becomes somewhat subjective. This is true of all hydrography but is particularly true in terms of side scan contacts. Must the data be adequate for a chart at 1:20,000, 1:40,000 or 1:80,000? The hydrographer recommends more specific guidance in the Project Instructions when this circumstance occurs.

**U. REFERRAL TO REPORTS ✓**

Title

Date

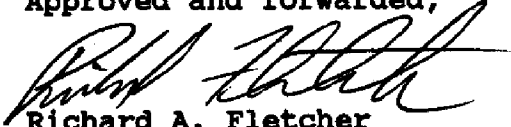
1994 Horizontal Control Report  
OPR-N251-PHP

September, 1994

Submitted for approval,

Approved and forwarded,

  
Kathryn Simmons  
Survey Technician

  
Richard A. Fletcher  
Lieutenant, NOAA  
Chief of Party

ITEM INVESTIGATION REPORT ✓

ITEM NO.: N1  
AWOIS Item #50356

CHART NO.: 18465  
(1:80,000)  
EDITION: 29th Edition  
CHART DATE: March 6, 1993

SURVEY: H-10583

**SOURCE AND DESCRIPTION:** Local Notice to Mariners 49/76, 13th Coast Guard Division, reported unidentified 40-foot fishing vessel sunk in approximately 30 feet of water, P.A. Charted as dangerous sunken wreck, P.A. Wreck was marked by an orange and white banded oil drum.

**SOURCE POSITION:** latitude 48°08'41.32"N  
longitude 123°26'04.66"W

**SURVEY REQUIREMENTS:** full investigation with 200% side scan sonar or 100% echosounder within a search radius of 300 meters.

**METHOD OF INVESTIGATION:** On DN 009, 200% side scan sonar coverage was attempted (Pos. Nos. 2041-2066). Because the target lies on the steep slope of Ediz Hook in the Strait of Juan de Fuca where currents are strong, the hydrographer decided to run the SSS lines along the shore and in line with the current. However, the near shore half of the target radius was so steep, the downslope swath of the sonargram was inadequate. The offshore half was so deep, surveyors could not maintain towfish height above the bottom within specified limits with the 43-meter cable available. On DN 018, a second attempt was made to achieve 200% coverage, this time perpendicular to shore (Pos. Nos. 2644-2670). In this case, the winch was not fast enough to maintain prescribed towfish heights; the towfish bottomed out; and subsequent sonargrams were partially degraded.

**RESULTS OF INVESTIGATION:** In spite of the problems encountered with this investigation, the hydrographer is satisfied that the coverage obtained within the target radius is complete. No evidence of a wreck was observed, neither on the sonargram nor on the echogram; no drum marked the site. Given the strong currents and steep slope it is very unlikely the wreck could have remained in the reported position. From the perspective of PHP's experience with a moving wreck off Dungeness Spit (H-10564), it is, indeed, very likely that the wreck has long since shifted downslope where it would not constitute a hazard to navigation. *Concur*

COMPARISON WITH PRIOR SURVEYS: N/A

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: A subsequent survey (H-10587) will acquire 100% side scan coverage along the length of Ediz Hook. If, again, no wreck is observed, the hydrographer recommends removing the dangerous wreck symbol from the chart. *Concur. No sign of wreck on the Sonargram from fix # 5679 to 5680 and from fix # 5710 to 5711 on H-10587.*

ITEM INVESTIGATION REPORT ✓

ITEM NO.: N2  
AWOIS Item #52057

CHART NO.: 18465  
(1:80,000)  
EDITION: 29th Edition  
CHART DATE: March 6, 1993

SURVEY: H-10583

SOURCE AND DESCRIPTION: Chart Letter 936/7: disposal area measuring approximately 0.3 nautical miles in diameter. AWOIS position is approximate center.

SOURCE POSITION: latitude 48°08'59.32"N  
longitude 123°24'04.66"W

SURVEY REQUIREMENTS: Assigned for information

METHOD OF INVESTIGATION: The search radius was intersected at 200-meter intervals with mainscheme echosounder hydrography on DN's 342, 343, 356 and 004. On DN 004, 100-meter splits were run (Pos. Nos. 1856-1866).

RESULTS OF INVESTIGATION: The disposal area is 75-80 meters deep and there is no evidence that any dumping has occurred. A telephone call to the Corps of Engineers confirmed that the site is not currently being used; however, it is an active site and should remain on the chart. *CONCUR*

COMPARISON WITH PRIOR SURVEYS: N/A

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: Chart the disposal area. Replace charted soundings with soundings from this survey. *CONCUR*

ITEM INVESTIGATION REPORT ✓

ITEM NO.: N3 CHART NO.: 18465  
SSS Contact 187.60S (1:80,000)  
EDITION: 29th Edition  
CHART DATE: March 6, 1993

SURVEY: H-10583

SOURCE AND DESCRIPTION: SSS Contacts:  
183.32S (DN 339), height 3.0m  
187.60S (DN 340), height 3.3m  
966.55S (DN 348), height 4.5m

SOURCE POSITION: 183.32S: latitude 48°07'37.2"N  
longitude 123°22'35.9"W  
187.60S: latitude 48°07'37.1"N  
longitude 123°22'35.6"W  
966.55S: latitude 48°07'37.1"N  
longitude 123°22'35.6"W

SURVEY REQUIREMENTS: N/A

METHOD OF INVESTIGATION: Side Scan Sonar, Echosounder, Dive Investigation.

RESULTS OF INVESTIGATION: On DN 348 (Pos. Nos. 960-968, VN 0651) divers investigating contact found a boulder 10 meters in diameter lying in 20 meters of water; visibility 40 feet. A detached position located the boulder at latitude 48°07'37.095"N, longitude 123°22'35.628" (Pos. No. 963). Least depth measured by leadline: 15.8 meters; Oceanic diver depth gauge reading: 52 feet. Reduced depth at MLLW based on predicted tides is 14.7 meters (7.7 fathoms). On the basis of this investigation, a Danger to Navigation report was issued (see Appendix I) Subsequent echosounder development (DN 012, VN 0652) produced a least depth of 13.5 meters (7.5 fathoms) at Pos. No. 5275. *Sounding from # 5273 +/- of 13.5 meters (7.5 fms) was shown on smooth sheet of Lat. 48°07'37.057, Lon. 123°22'35.657.*

COMPARISON WITH PRIOR SURVEYS: A 9-1/4-fathom (16.9-meter) sounding plots at the contact location on prior survey H-6649.

COMPARISON WITH CHART AND CHARTING RECOMMENDATIONS: No soundings are charted in the immediate vicinity; however, the surveyed least depth plots approximately 300 meters from a 21.9-meter (12-fathom) charted sounding. Replace charted soundings with soundings from this survey. *CONCUR* In addition, Chart 14 RK (13.5 meters) as found by this survey and delete charted rock (Gov 7 1/2 fms).

ITEM INVESTIGATION REPORT ✓

ITEM NO.: N4  
SSS Contact 70.48S

CHART NO.: 18465  
(1:80,000)

EDITION: 29th Edition  
CHART DATE: March 6, 1993

SURVEY: H-10583

DESCRIPTION AND SOURCE OF ITEM: SSS Contact  
computed height 3.7m

SOURCE POSITION: latitude 48°07'23.1"N  
longitude 122°21'28.80"W

SURVEY REQUIREMENTS: N/A

METHOD OF INVESTIGATION: Echosounder, Dive, Side Scan Sonar

RESULTS OF INVESTIGATION: On DN 339 contact 70.48S was developed with echosounder (Pos. Nos. 80-113, VN 0651). A least depth of 11.5 meters (6.3 fathoms) was located at latitude 48°07'22.959"N, longitude 123°21'28.754"W. On DN 348 (Pos. Nos. 969-970) divers investigating the contact found a boulder 10 meters in diameter lying in 18 meters of water; visibility 40 feet. A detached position located the boulder at latitude 48°07'23.209"N, longitude 123°21'28.817" (Pos. No. 970). Least depth measured by leadline: 14.0 meters; Oceanic diver depth gauge reading: 44 feet; echosounder: 12.9 meters. Because of the discrepancy between the depth gauge and leadline measurements, the analog depth on the dive DP was not edited. Reduced depth at MLLW based on ~~predicted~~ tides is 11.5 meters (6.3 fathoms). *Sounding from # 82+1 of 10.9 meters (5.9 fms) was shown on smooth sheet at Lat. 48° 07' 23.031, Lon. 123° 21' 28.643. All Rk notation (S<sup>3</sup>Rk)*

COMPARISON WITH PRIOR SURVEYS: Prior survey depicts a sounding of 5<sup>4</sup>/<sub>6</sub> fathoms (10.4 meters) at the contact position.

CHARTING RECOMMENDATIONS: Charted sounding is 10.0 meters (5.5 fathoms) located at latitude 48°07'24.00N, longitude 123°21'30.00W. Replace charted soundings with soundings from this survey. *CONCUR*

**ITEM INVESTIGATION REPORT**

**ITEM NO.:** N5  
7-1/2 fathom shoal

**CHART NO.:** 18465 (1:80,000)  
**EDITION:** 29th Edition  
**CHART DATE:** March 6, 1993

**SURVEY:** H-10583

**DESCRIPTION AND SOURCE OF ITEM:** The shoal appears on Chart 18465 with a least depth of 7.5 fathoms (13.7 meters)

**SOURCE POSITION:** latitude 48°09'42.00"N  
longitude 123°28'34.80"W

**SURVEY REQUIREMENTS:** N/A

**METHOD OF INVESTIGATION:** On DN 012 crossline hydrography defined the limits of the shoal (Pos. Nos. 2327-2424). Further echosounder development was conducted on DN 023 (Pos. Nos. 2671-2711) to determine least depth.

**RESULTS OF INVESTIGATION:** Least depth of 13.<sup>0</sup>/<sub>2</sub> meters (7.<sup>1</sup>/<sub>2</sub> fathoms) was located at latitude 48°09'39.850"N, longitude 123°28'40.824"W.

**COMPARISON WITH PRIOR SURVEYS:** Not available.

**COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:** Chart 7.<sup>1</sup>/<sub>2</sub>-fathoms at latitude 48°09'39.850"N, longitude 123°28'40.824"W. *concur*

CONTROL STATIONS as of 24 Feb 1995 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel Code	MM/DD/YY	Station Name
001	G	048:19:49.402	123:15:52.444	22	130	0.0	0.0	A 09/15/94	PT ATKINSON, B.C. (WANC DGPS)
002	G	048:17:52.258	123:31:54.747	-6	130	0.0	0.0	J 09/15/94	RACE ROCKS, B.C. (VICT. DGPS)
100	G	048:08:23.134	123:24:50.121	-19	250	0.0	0.0	07/30/94	DGPS CHK PT. (USCG DOCK)
101	G	048:07:25.144	123:27:04.024	-17	130	0.0	0.0	07/30/94	944 4090 A TIDAL
102	G	048:08:23.414	123:24:10.221	-18	130	0.0	0.0	07/30/94	TUCKER 1862



**APPROVAL SHEET**

for

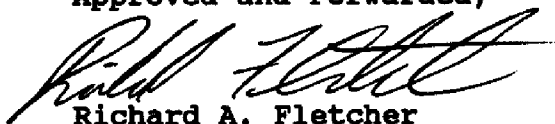
**Survey H-10583**

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 1994.

The field sheets and supporting data have been reviewed by me. They are complete and adequate for charting purposes, and are approved. All records are forwarded to N/CG245, Pacific Hydrographic Section, for final review and processing.

Approved and Forwarded,

DATE: February 24, 1995



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



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

Pacific Hydrographic Party  
Post Office Box 760  
Port Angeles, WA 98362-0137  
Phone: (206) 457-4206  
FAX (206) 457-4371

December 16, 1994

Commander  
Thirteenth Coast Guard District (oan)  
Federal Building, Room 3410  
915 Second Avenue  
Seattle, WA 98174-1067

**ADVANCE  
INFORMATION**

Dear Sir:

The NOAA Pacific Hydrographic Party has discovered a potential danger to navigation while conducting survey operations in the Strait of Juan de Fuca. A Danger to Navigation Report is enclosed along with a chartlet showing the affected portion of Chart 18465.

I recommend this Danger to Navigation be included in the next Local Notice to Mariners.

Sincerely,

Guy T. Noll  
Lieutenant, NOAA  
Chief

Enclosures

cc: DMAHTC  
N/CG221  
N/CG245



## REPORT OF DANGER TO NAVIGATION

**Hydrographic Survey Registry Number:** H-10583

**Survey Title:** PHP-10-6-94

**State:** WA

**ADVANCE  
INFORMATION**

**General Locality:** Strait of Juan de Fuca

**Sublocality:** Approaches Port Angeles Harbor

**Project Number:** OPR-N251-PHP

The following item which is a potential danger to navigation was discovered during hydrographic survey operations by the NOAA Pacific Hydrographic Party.

**Object Discovered:** A boulder ten meters in diameter, rising five meters from the bottom was located at latitude 48°07'37.095"N, longitude 123°22'35.628"W. Dive investigation confirmed a least depth of 14.2 meters (7.7 fathoms) at MLLW based on predicted tides. This depth plots over the 10-fathom depth contour. The boulder is approximately 100 meters east of the charted pipeline and 120 meters south of the end of the pipeline

**Affected nautical charts:**

Chart Number	Edition		Surveyed Depth	Chart Datum	Geographic Position	
	No.	Date			Latitude	Longitude
18400	37th	10/05/91	14.2m (7.5 fm)	NAD83	48°07'37.095"N	123°22'35.628"W
18440	21st	08/29/92		NAD83		
18465	29th	03/06/93		NAD83		

Questions concerning this report should be directed to NOAA, Pacific Hydrographic Section, N/CG245, 7600 Sand Point Way NE, Bin C15700, Seattle, WA 98115-0070, telephone number (206) 526-6853.

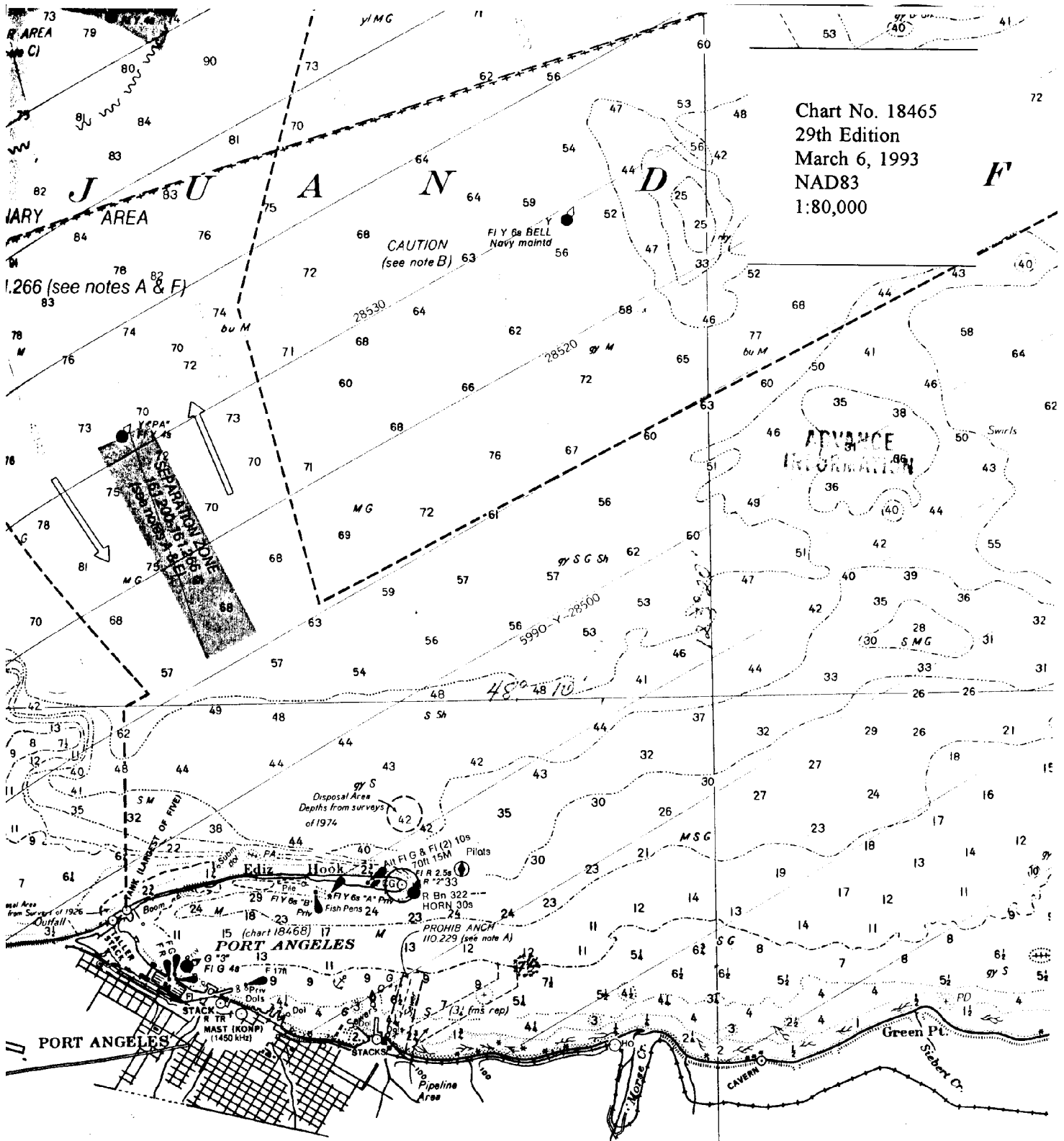


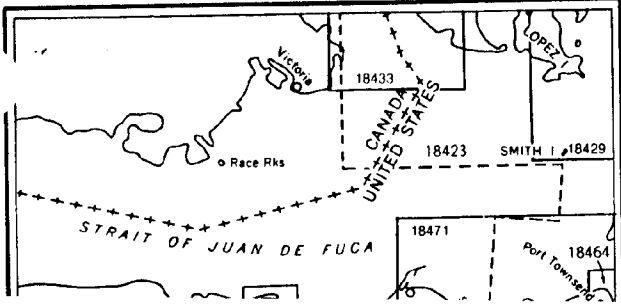
Chart No. 18465  
 29th Edition  
 March 6, 1993  
 NAD83  
 1:80,000

I.266 (see notes A & F)

CAUTION  
 (see note B)

CAUTION  
 SUBMARINE PIPELINES AND CABLES  
 Charted submarine pipelines and submarine cables and submarine pipeline and cable areas are shown as:  
 --- Pipeline Area  
 --- Cable Area

Additional uncharted submarine pipelines and submarine cables may exist within the area of this chart. Not all submarine pipelines and submarine cables are required to be marked and those that were originally buried





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Ocean and Earth Sciences  
Silver Spring, Maryland 20910

ORIGINAL

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: April 6, 1995

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-N251

HYDROGRAPHIC SHEET: H-10583

LOCALITY: Washington, Strait of Juan de Fuca, Approaches to  
Port Angeles Harbor

TIME PERIOD: January 27, 1994; November 30, 1994 - January 26, 1995

TIDE STATION USED: 944-4090 Port Angeles, Strait of  
Juan de Fuca, Wa.  
Lat.  $48^{\circ} 7.5'N$  Lon.  $123^{\circ} 26.4'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 30.20 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 6.5 ft.

REMARKS: RECOMMENDED ZONING

Times and heights are direct on Port Angeles, Wa. (944-4090).

Notes: 1. Times are tabulated in Greenwich Mean Time.  
2. Data for Port Angeles, Wa. (944-4090) are temporarily  
stored in file #744-4090.

*William M. Fisher*  
-----  
CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 18465, 18468 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 GRAND MCNALLY ATLAS H U.S. LIGHT LIST K									
	A	B	C	D	E	F	G	H	K	
EDIZ HOOK	X		X							1
JUAN DE FUCA, STRAIT OF	X		X							2
MORSE CREEK	X		X							3
PORT ANGELES	X		X							4
PORT ANGELES HARBOR			X							5
WASHINGTON (title)	X		X							6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

Approved

*Charles C. Lee*

Chief Geographer

SEP 29 1995

**HYDROGRAPHIC SURVEY STATISTICS**

H-10583

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS
ACCORDION FILES	2				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

**SHORELINE DATA**

SHORELINE MAPS (List): **DM-10157, DM-10158, DM-10159**

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List): **18465 30th ED**

**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			3904	
POSITIONS REVISED				
SOUNDINGS REVISED				
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS	42		42	
VERIFICATION OF SOUNDINGS	20		20	
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPILATION OF SMOOTH SHEET	217.5		217.5	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		4	4	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		10	10	
GEOGRAPHIC NAMES				
OTHER*				
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	279.5	14	293.5

Pre-processing Examination by <b>D. Hill</b>	Beginning Date <b>5/19/95</b>	Ending Date <b>5/19/95</b>
Verification of Field Data by <b>J. Stringham, D. Doles, R. Mihailov, L. Deodato</b>	Time (Hours) <b>279.5</b>	Ending Date <b>2/5/96</b>
Verification Check by <b>B. Olmstead</b>	Time (Hours) <b>2</b>	Ending Date <b>2/8/96</b>
Evaluation and Analysis by <b>L. Deodato</b>	Time (Hours) <b>14</b>	Ending Date <b>2/12/96</b>
Inspection by <b>B. Olmstead</b>	Time (Hours) <b>9</b>	Ending Date <b>3/11/96</b>

## **EVALUATION REPORT**

**H-10583**

### **A. PROJECT**

Project information is discussed in the hydrographer's report.

### **B. AREA SURVEYED**

This survey was conducted in Washington, and is located along the Strait of Juan de Fuca, and the approaches to Port Angeles Harbor. The surveyed area is bounded by latitude 48/10/00N to the north and along the shoreline north and east of Ediz Hook. The eastern limit is longitude 123/19/00W and the western limit is longitude 123/30/10W. Depths range from 1.8 meters to 125 meters.

### **C. SURVEY VESSELS**

Survey vessel information is found in the hydrographer's report.

### **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, Version 12.0.

At the time of the survey certification the format for transmission of digital data had not been formally 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 was created with .dbf (extension) and enhanced using the AutoCad system, are filed both in the AutoCad drawing format, .dwg (extension); and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHS until data transfer protocols are developed and improved.

The drawing files necessarily contain information which is not part of the HPS data set such as geographic names text, line-type data, 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 Guideline No. 75.

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



## **E. SONAR EQUIPMENT**

Side scan sonar was used on survey H-10583. Refer to section E of the hydrographer's report concerning set-up, operation and processing of survey data.

## **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 an actual tide, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with NOS specifications. Actual tide reduction is derived from the Port Angeles, Washington, gage 944-4090.

## **H. CONTROL STATIONS**

Control stations are discussed in the hydrographer's report and separates. A list of control stations used on survey H-10583 is attached to this report.

The positions of horizontal control stations used during hydrographic operations are field values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON.

Data based on NAD 27 may be referenced to this survey by applying the following corrections:

Latitude:	-0.673 seconds	(-20.800 meters)
Longitude:	4.668 seconds	(96.500 meters)

## **I. HYDROGRAPHIC POSITION CONTROL**

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. The quality of several positions exceeds limits in terms of horizontal dilution of precision (HDOP). These positions are isolated and occur randomly throughout the survey area. A review of the data, however, suggests that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable.

## **J. SHORELINE**

The following digitally compiled shoreline map on NAD 83 applies to this survey.

<u>Map Number</u>	<u>Photo Date</u>	<u>Scale</u>
DM-10157	July 1991	1:20,000
DM-10158	July 1991	1:20,000
DM-10159	July 1991	1:20,000

Shoreline from DM-10157, DM-10158, and DM-10159 were merged with the survey file during ACAD processing. There are no changes to the digitized shoreline.

#### **K. CROSSLINES**

Crosslines are discussed in the hydrographer's report.

#### **L. JUNCTIONS**

Survey H-10583 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10555	1994	1:10,000	east
H-10587	1995	1:5,000	south

The junction with surveys H-10555 and H-10587 are complete. Soundings and depth curves are in good agreement within the common area.

#### **M. COMPARISON WITH PRIOR SURVEYS**

H-5159 (1931) 1:40,000  
H-6649 (1940) 1:10,000  
H-6653 (1940-43) 1:20,000  
H-9414 (1974) 1:40,000

The prior surveys listed above cover the entire area of the present survey. Sounding agreement is good, with the present survey depths deeper between 1 and 3 meters. Differences can be attributed to increased bottom coverage and less accurate positioning and sounding methods available in 1940.

The following features have been brought forward from prior survey H-6649.

<u>Feature</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
rock	48/06/50.54	123/19/21.93
rock	48/06/49.89	123/19/26.78
rock	48/06/49.31	123/19/35.85
rock	48/06/55.75	123/21/57.62
rock	48/06/52.82	123/22/14.66
rock	48/06/54.32	123/22/30.70
rock	48/06/56.40	123/22/33.52

rock	48/06/53.80	123/23/07.34
rock	48/06/54.12	123/23/08.07
rock	48/06/53.80	123/23/09.04
rock	48/06/53.73	123/23/11.22

With the exception of the features listed above, H-10583 is adequate to supersede the prior surveys within the common area.

#### **N. ITEM INVESTIGATIONS**

AWOIS item 50356, 52057, two SSS contacts and a 7.5 fathom shoal were adequately investigated during survey operations. Refer to the hydrographer's report for discussion and disposition of these items.

#### **O. COMPARISON WITH CHART**

Survey H-10583 was compared with the following chart.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
18465	30th	January 7, 1995	1:80,000	NAD83

##### **a. Hydrography**

Charted hydrography originates with the above mentioned prior surveys and miscellaneous sources and requires no further discussion.

Survey H-10583 is adequate to supersede charted hydrography within the common area.

#### **P. ADEQUACY OF SURVEY**

Hydrography contained on survey H-10583 is adequate to:

- a. delineate the bottom configuration, determine least depths, and draw the required depth curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigation; 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**

A privately maintained buoy was located by the hydrographer and is shown on the smooth sheet. The charted light at Ediz Hook and seven landmarks were not verified by the hydrographer. These features has been digitized as part of the shoreline manuscript and graphically portrayed on the smooth sheet.

#### **R. STATISTICS**

Statistics are itemized in the hydrographer's report.

#### **S. MISCELLANEOUS**

Miscellaneous information is discussed in the hydrographer's report.

#### **T. RECOMMENDATIONS**

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

#### **U. REFERRAL TO REPORTS**

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

*Leonardo T. Deodato*  
Leonardo T. Deodato  
Cartographer

APPROVAL SHEET  
H-10583

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 digital data have been completed and all revisions and processing have been entered in the magnetic tape record for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report. Final control, position and sounding printouts have been included with the survey records.

Bruce A. Olmstead Date: 3/11/96  
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: 3/13/96  
Kathy Timmons  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

\*\*\*\*\*

Final Approval

Approved:

Andrew A. Armstrong III Date: 5/30/96  
Andrew A. Armstrong III  
Captain, NOAA  
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH  
**RECORD OF APPLICATION TO CHARTS**

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10583

**INSTRUCTIONS**

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
18468	4/23/96	<i>L. Burkhardt</i>	Full Part <del>Before</del> After Marine Center Approval Signed Via Drawing No. Full application of soundings from smooth sheet
18465	5/9/96	<i>L. Burkhardt</i>	Full Part <del>Before</del> After Marine Center Approval Signed Via Drawing No. Full application of soundings and features from smooth sheet
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.