

5577

(And Add'l. Wk, 1936, For Which SEE
5710, Add'l Wk 1936, D.R.)

U. S. COAST & GEODETIC SURVEY
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5577

(And Add'l. Wk. 1936,
For Which SEE
5710, Add'l Wk. 1936 D.R.)

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. PATTON, Director

State: WASHINGTON

DESCRIPTIVE REPORT

~~Topographic~~
Hydrographic } Sheet No. 7. 5577

LOCALITY

LIBERTY BAY

PUGET SOUND

1934.

CHIEF OF PARTY

JACK SENIOR

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 7 5577
LIBERTY BAY, PUGET SOUND
WASHINGTON

- 0 -

JACK SENIOR, CHIEF OF PARTY, C. & G. SURVEY
SEASON OF 1934

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
JAN 2 1936
REG. NO. 5577
Acc. No.

HYDROGRAPHIC TITLE SHEET

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. 7

REGISTER NO. 5577

State Washington
General locality Puget Sound
Locality Liberty Bay
Scale 1:10,000 Date of survey August, 19 34.
Vessel U.S.C. & G.S.S. EXPLORER
Chief of Party Jack Senior
Surveyed by E. B. Lewey
Protracted by F. S. Butler
Soundings penciled by F. S. Butler
Soundings in ~~fathoms~~ feet
Plane of reference M.L.L.W.
Subdivision of wire dragged areas by _____
Inked by E. F. Greene, Jr.
Verified by E. F. Greene, Jr.
Instructions dated March 29, 19 34.

Remarks: _____

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 7 5577

LIBERTY BAY, PUGET SOUND

WASHINGTON

AUTHORITY:

Director's Instructions dated March 29, 1934, Project H.T. - 171.

LIMITS AND GENERAL DESCRIPTION:

This sheet covers approximately the area between Latitudes $47^{\circ} 41.5' N.$, and $47^{\circ} 44.5' N.$; and Longitudes $122^{\circ} 36.0' W.$ and $122^{\circ} 39.5' W.$ A junction is made with Field Sheet No. 5, 1934, at the southern limit of the sheet.
(H-5576)

Liberty Bay makes off in a north-west direction from the north-west corner of Port Orchard. It is approximately 4 miles long and averages $1/2$ mile in width. The south-eastern half of the bay is narrow and crooked, the north-western half is wider and more or less straight.

The shores of Liberty Bay are wooded and low.

CONTROL:

Triangulation and topography executed by the Party during the season furnished the necessary control.

METHODS:

The approved methods of the Service were used. Soundings were taken with ten pound handleads.

Shoals were developed by numerous handlead soundings taken while drifting over the shoals and by close inspection of the bottom wherever it was visible.

Sounding lines were run by ranges in an east and west direction, or approximately normal to the shoreline. In the vicinity of docks, points, and critical areas lines were spaced 25 meters apart. Elsewhere, the lines were spaced 50 meters apart.

All work on this sheet was done with Tender No. 1, Mr. Lewey in charge, positions in small case letters and blue.

CHARACTERISTICS OF THE SHORELINE AND BOTTOM:

The shoreline is mostly sand and gravel. Mud flats exist at the head of the bay and in the small bights on the south side of the bay.

Mud is the predominating bottom characteristic.

CURRENTS:

From observations while sounding, the maximum current exists in the narrow portion of the bay just north of the town of Keyport, or in Latitude 47° 42.4' N. and Longitude 122° 37.4' W. This current is approximately 2-1/2 knots at the strength of the tide. At this particular point, the set is westward on flood tide and eastward on ebb tide. In general, the set is into the bay (north-west) on flood tide and out of the bay (south-east) on ebb tide.

CHANNELS:

In navigating the south-eastern, or winding part of the bay, the westerly and southerly shores should be favored slightly so as to avoid the shoal point in Latitude 47° 42.5' N. and Longitude 122° 37.5' W., and the 16 foot shoal in Latitude 47° 42.57' N. and Longitude 122° 37.7' W. By steering such courses, a depth of about 30 feet can be carried into the bay. In the north-western and wider part of the bay, the eastern shore should be favored. The bay shoals towards its head to such an extent that 10 feet is the controlling depth at the main dock in Poulsbo. *36 inch local knowledge - H.M.M.*
10 1/2 & 11 1/2, based on soundings only, H.M.M.

ANCHORAGES:

A safe anchorage may be obtained anywhere in Liberty Bay. The only care required is to secure the desired depth by use of a handlead or by inspection of the chart.

COMPARISON WITH EXISTING CHARTS:

This survey agrees satisfactorily with chart No. 6443 except for three rocks and other items discussed in the review. H.M.M.

A sunken rock shown on chart No. 6443 in Latitude 47° 43.4' N. and Longitude 122° 38.3' W. could not be verified. A buoy was anchored on the spot and the immediate vicinity thoroughly sounded with a hand lead. Removal of rock from chart is recommended.

From Chart Letter 295(1923) - See Rev. for disposition of rock. H.M.M.

A sunken rock shown on chart No. 6443 just north by west of the dock at Lemolo in Latitude 47° 42.85' N. and Longitude 122° 37.7' W. was found but its position differs slightly from the position as shown on the chart. Its position, description and depth is listed under "Dangers and Obstructions". P 9

See notes here. See Review. xmm.

A sunken rock shown on chart No. 6443 just south-west of the dock at Lemolo and marked "P.D." could not be verified. Latitude 47° 42.77' N., Longitude 122° 37.77' W. Considerable time was spent sounding in the immediate vicinity and the bottom was closely inspected. Bottom is visible here at low tide. Removal of rock from the chart is recommended. *From Chart Letter 105 (1922).*

For description, see Rev. xmm.

DANGERS AND OBSTRUCTIONS:

1. A sunken rock covered 1/2 foot at M.L.L.W., 130 meters, 188° true from triangulation station "VIEW", 1934. Position 62 "j". Bottom not visible here due to discoloration of water. φ 47°-44.10
λ 122°-38.85
2. Numerous old and broken pilings 100 meters south-east of the main dock in Poulsbo. Latitude 47° 44.0' N. and Longitude 122° 38.75' W. These pilings are the remains of an old dock and some of them are below the surface of the water at low tide. ✓
3. Two lines of broken and sunken pilings extending 470 meters, 126° true from topographic signal "LING". Pilings are the remains of an old dock. ✓ φ 47°-43.90
λ 122°-38.60
4. A small shoal awash at M.L.L.W., 210 meters, 109° true from triangulation station "CLAY", 1934. The second sounding after position 105 "g". ✓ φ 47°-43.47
λ 122°-39.30
5. Outer and eastern edge of an oyster bed, 250 meters due north of triangulation station "LOST", 1915. ✓ φ 47°-43.35
λ 122°-39.20
6. Low water point, ⁵⁰~~170~~ meters, ^{59°}~~72°~~ true from triangulation station "LOST", 1915. ✓ φ 47°-43.25
λ 122°-39.18
7. Rock bearing 5 feet at M.L.L.W., 130 meters, 99° true from topographic signal "HAN", position 27 "e". ✓ φ 47°-42.9
λ 122°-38.9

8. Rock bearing 3 feet at M.L.L.W., $\phi 47^{\circ} 42.90$ ✓
100 meters, 342° true from triangulation station "ROCK", 1915. $\lambda 122^{\circ} 37.65$

9. A small flat sunken rock covered See B, top of
page 3
8-1/2 feet at M.L.L.W., 150 meters, 269° true from triangulation station "ROCK", 1915. Position 13 "e". The rock projects only about 2 feet above surface of the bottom. Bottom is of sand and mud and is visible at low tide. This is the rock that is slightly out of position as shown on chart No. 6443. A careful inspection of the bottom was made in searching for other rocks in this vicinity, none were found. $\phi 47^{\circ} 42.85$ ✓
 $\lambda 122^{\circ} 37.75$

10. Group of sunken pilings just south- $\phi 47^{\circ} 42.78$
east of dock at Lemolo, or 160 meters, 220° true from triangulation station "ROCK", 1915. Position 8 and 9 "e". $\lambda 122^{\circ} 37.70$ ✓
for both positions.

11. A 16 foot shoal, 215 meters, 278°
true from triangulation station "MOLO", 1934. The sounding before position 53 "d". The shoal is 180 meters long in a north-west and south-east direction and is practically in the center of the entrance to the wider part (north-western part) of Liberty Bay. $\phi 47^{\circ} 42.55$ ✓
 $\lambda 122^{\circ} 37.76$

12. Rock bearing 2 feet at M.L.L.W., 105 $\phi 47^{\circ} 42.35$ ✓
meters, 73° true from triangulation station "JACKMAN", 1934. $\lambda 122^{\circ} 37.75$

13. Sand bar extending 330 meters, 322°
true from triangulation station "KEY", 1934. Bar is about 70 meters in width. A small buoy (position 93 "b") located at the south-west edge of the bar marks a narrow channel to westward of the bar. Entrance to the small channel is from the north-west. $\phi 47^{\circ} 42.13$ ✓
 $\lambda 122^{\circ} 36.88$

14. Rock bearing 1-1/2 feet at M.L.L.W., $\phi 47^{\circ} 41.73$ ✓
125 meters, 194° true from triangulation station "SWAMP", 1916. $\lambda 122^{\circ} 36.12$

All rocks and ledges close inshore and the limits of the mud flats are properly noted on the smooth sheet. ✓

NOTE:

Positions 1 and 2 "j" are alongside of small buoys which mark the Torpedo Range. Vessels should keep to eastward of this range when it is in use. A red flag hoisted on the south dock of the Naval Torpedo Station warns that torpedo firing is in progress.

For pos. 1j;
 $\phi 47^{\circ}-41'66$
 $\lambda 122^{\circ}-36'60$
For pos. 2j;
 $\phi 47^{\circ}-41'90$
 $\lambda 122^{\circ}-36'72$ ✓

Respectfully submitted,

Ernest B. Lewey
Ernest B. Lewey
Jr. H. & G. E., C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Approved and forwarded,

Jack Senior

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

12/26/34

STATISTICS

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 7 5577

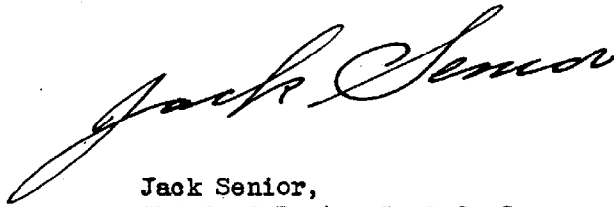
LIBERTY BAY

PUGET SOUND - WASHINGTON

DATE 1934	VOL.	DAY	BOAT	STAT. MILES	POS.	SOUNDINGS HAND-MACH.	AREA	NAUTICAL MI. RUN TO & FROM-MISC.-TOTAL		
Aug. 18	1	a	T.#1	16.0	182	990	---	4.0	2.0	20.0
" 19	1&2	b	"	11.2	153	714	---	8.0	1.4	19.2
" 20	2	c	"	13.6	176	913	---	12.0	1.7	25.6
" 21	2&3	d	"	15.1	215	1009	---	9.5	---	24.6
" 23	3	e	"	4.8	80	375	---	24.0	---	28.8
" 27	3&4	f	"	9.3	115	619	---	27.0	1.2	36.3
" 28	4	g	"	11.9	138	756	---	11.0	0.6	22.0
" 29	4&5	h	"	21.0	220	1147	---	12.0	2.8	33.0
" 30	5	j	"	<u>1.8</u>	<u>74</u>	<u>167</u>	---	<u>10.0</u>	<u>3.5</u>	<u>15.1</u>
Total For Sheet:				104.7	1353	6690	---	117.5	13.2	224.6

APPROVAL NOTE BY CHIEF OF PARTY

Hydrographic field sheet No. 7, together with accompanying records and report, has been examined and approved by me. Lieutenant (j.g.) E. B. Lewey, the officer in charge of this work, is experienced and efficient, and the field sheet required little supervision. The plotting and protracting was done by F. S. Butler, Draftsman, under direct supervision of Lieut. Lewey. Butler also took left angle in the field.

A handwritten signature in cursive script that reads "Jack Senior". The signature is written in dark ink and is positioned above the typed name and title.

Jack Senior,
Chief of Party, C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. 557.7

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

Number of positions on sheet	.1353.
Number of positions checked	..208.
Number of positions revised	....0.
Number of soundings recorded	.6690.
Number of soundings revised	....0.
Number of signals erroneously plotted or transferred	....0.

Date: April 8, 1935.

Verification by

E. F. Greene Jr.

Time: 70 Hours.

Review by

H. W. Murray

Time: 19 1/2 "

700

F.E

March 13, 1935.

✓ Division of Hydrography and Topography:

Division of Charts: **Attention Mr. E. P. Ellis**

Tide Reducers are approved in
5 volumes of sounding records for


HYDROGRAPHIC SHEET **5877**

Locality **Liberty Bay, Puget Sound, Wash.**

Chief of Party: **Jack Senior in 1934**
Plane of reference is **mean lower low water, reading**
2.7 ft. on tide staff at **Poulsbo**
21.4 ft. below **B.M. 1**

Height of mean higher high water above plane of reference is 11.9 ft.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

VERIFICATION OF H-5577.

APRIL 8, 1935.

1. The records conform acceptably to the requirements in the General Instructions.

2. It was possible to draw the usual depth curves completely.

3. The field plotting was acceptably completed.

4. The office draughtsman had to erase a sounding (position 2j) to insert a buoy, and to change a "rock under water" symbol to a rock awash symbol (see position 62j). Otherwise the field draughting was acceptable.

5. It is not now possible to say whether the junction with the only contemporary sheet (H-5576) is satisfactory since it has not been verified.

6. See Blue pencil note on page 19 of sounding volume 4, with reference to failure to relocate 6-foot sounding. This sounding was searched for and registered as being 1 fm. too shall by the F.P. (Lat. $47^{\circ}43'2''$, Long. $122^{\circ}39'0''$)

G. F. Greene, Jr

Verifier.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5577 (1934), FIELD NO. 7

Liberty Bay, Puget Sound, Washington

Surveyed in 1934

Instructions dated March 29, 1934 (Director's letter)

Hand Lead Soundings

3 Point fixes on shore signals

Chief of Party - Jack Senior.
Surveyed by - E. B. Lewey.
Protracted by - F. S. Butler.
Soundings penciled by - F. S. Butler.
Verified and inked by - E. F. Greene, Jr.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. There was no evidence that the plotting of topographic signals was checked in the field since no initials pertaining to the checking appeared on the sheet. This was accomplished in the office.
- b. No tidal station was plotted on either the boat sheet nor smooth sheet. (Par. 160.)
- c. Several topographic signals falling outside the high water line do not show the features on which they are located. However, all of these fall inside the low water line and are considered to be of a temporary nature.
- d. The "Descriptive Report" is clear and comprehensive and satisfactorily covers all matters of importance except as noted in paragraph 2 of this review.

2. Compliance with Instructions for the Project.

The plan, character and extent of the survey satisfy the instructions for the project with the exception that charted rocks transferred to the boat sheet prior to field examination were transferred without regard to the datum of the chart (North American). Consequently it appears that all rocks searched for and not found are actually in positions approximately 50 meters in a SSE direction from their positions as shown on the boat sheet, which fact alters several of the decisions and dispositions contained in the Descriptive Report.

3. Sounding Line Crossings.

No general system of cross lines was run but those that were as well as the adjacent lines show good agreement.

4. Depth Curves.

The usual depth curves may be completely drawn.

5. Junctions with Contemporary Surveys.

The junction on the south with H 5576 (1934) is satisfactory.

6. Comparison with Prior Surveys.

a. H 1694 (1885) and H 3763 (1915-17).

Soundings shown on the above surveys are generally in good agreement with those of the present survey, although a marked deepening of as much as 5 feet is shown on the present survey in the vicinity of lat. $47^{\circ} 43.3'$, long. $122^{\circ} 39.1'$. Several discrepancies noted in connection with H 3763 (1915-17) are as follows:

- (1) The single 24 foot sounding (charted) in lat. $47^{\circ} 42.5'$, long. $122^{\circ} 37.8'$ and the single 14 (charted) in lat. $47^{\circ} 42.9'$, long. $122^{\circ} 38.4'$ fall in depths of 44 and 18 feet respectively on the present survey and were questioned in the Descriptive Report of the old survey. Soundings on the present survey in the immediate vicinities show a comparatively even bottom and no indication of shoaling. The soundings are probably leadmen's errors and should be disregarded in future charting.
- (2) The sunken rock (charted) in lat. $47^{\circ} 42.8'$, long. $122^{\circ} 37.7'$ (NNW of dock) originates with a 10 $1/2$ foot sounding obtained on a rock, and falls in depths of 11 feet on the present survey and is 90 meters SSE of a sunken rock with least depth of 9 feet located by the present ^{field party} survey. Both rocks project about 2 feet above the bottom, both are located by two 3-point fixes, and are therefore considered as two separate rocks. The rock on the 1915-17 survey has been transferred to the present survey and is designated by a 10 foot sounding accompanied by the notation "Rk".

b. H 3969 (1916-17) W. D.

A comparison of the present survey with the effective depths on the wire drag sheet reveals several inconsistencies near the inshore limits of the drag work to the northwest of Point Bolin. In all of these cases the discrepancies occur near the end launch side of the drag which in "single control work" is the weakest determined side. In addition, the drag strips used on this survey were the varying effective depth type which also introduces uncertainties in plotting the intermediate buoy paths. Aside from these uncertain factors, the verifier of H 3969 (1916-17) W.D. notes that the "subdivision of drag areas was not accurately done, but was not corrected." It should also be noted that the depths on the present survey are in agreement with depths on the prior surveys, thus eliminating the possibility of changes in bottom having occurred since the wire drag survey.

The few soundings on H 3969 (1916-17) W. D. that fall within the limits of the present survey have not been transferred to the latter as they are not isolated shoals or rocks and are in agreement with the depths obtained on the present survey.

c. T 1637 (1881).

Several rocks originating with this survey and which cannot be properly disposed of in the review of T 6265 (1934) are as follows:

- (1) The two sunken rocks (charted) in lat. $47^{\circ} 44.1'$, long. $122^{\circ} 38.9'$ falling very near the low water line (the northernmost rock falls in depths of 2 feet) were not found on the present survey. However, a rock awash (charted -- actually covered $1/2$ foot) just offshore of the sunken rocks was found on both the present hydrographic and topographic surveys and agrees in position with a third sunken rock on T 1637 (1881). The above inshore sunken rocks are believed to be a generalized representation of a boulder strewn beach and should be disregarded in future chartings.
- (2) The sunken rock (charted) in lat. $47^{\circ} 42.7'$, long. $122^{\circ} 38.1'$ falling in depths of 6 to 12 feet on the present survey was not found on that survey nor on other hydrographic and topographic surveys covering these areas. It is quite probable that this rock is a generalized representation of a rocky or boulder strewn area but because of lack of a definite investigation of the rock it is being carried forward.

- (3) The group of bare and ~~sunken~~ rocks (charted) in lat. 47° 41.6', long. 122° 37.0' and falling in depths of as much as 9 feet on the present survey (several fall inshore of the low water line) were not found on that survey nor on T 6265 (1934) and H 1694 (1885). However, T 6265 (1934) shows several boulders inside the low water line. The above rocks are believed to be a generalized representation and not any specific dangers. They should be disregarded in future chartings.

7. Comparison with Chart No. 6443.

a. Hydrography

Soundings shown on the chart originate with surveys discussed in preceding paragraphs of this review and need no further consideration. However, it should be noted that the plane of reference on the older editions of this chart was 2 feet below M.L.L.W. Consequently, a number of charted soundings originating with the older prior surveys, as for example the 22 in lat. 47° 41.5', long. 122° 36.0' originating with H 1694 (1885) were inadvertently uncorrected for the 2 foot difference when the reference plane was changed on the chart. Agreement of these corrected soundings with depths on the present survey is therefore improved.

Several charted rocks originate with outside sources. Dispositions of these are as follows:

- (1) The charted sunken rock in lat. 47° 42.8', long. 122° 37.7' (SSW of dock, PD) falling in depths of 16 feet on the present survey originates with Chart Letter No. 105 (1922) and was reported as being "about 100 m. south (magnetic) from end of dock." The rock as charted was transferred directly from a submitted section of the chart on which the rock was spotted. A re-plotting based on the reported bearing places the rock 30 meters SE of its charted position. Inasmuch as the field party searched for this rock in an area which is about 60 meters to the north-westward of the revised position, their inability to find the rock is not considered sufficient evidence to disprove its existence. The rock should be retained on the chart in its corrected reported position (plotting by bearing) pending the results of additional field work after which a final disposition will be made.

This rock cleared by a 6 foot drag but not considered disproved. See Rev. (par. B-5) of Ad. Wk. (1936) attached to D.R. of H-5710. H.W.M. 2/5/37

- (2) The charted rock awash in lat. $47^{\circ} 41.7'$, long. $122^{\circ} 36.1'$ originates with Chart Letter No. 293 (1933), is plotted by two distances and bearings from known objects and falls 20 meters NE of a rock awash (1 1/2 feet at M.L.L.W.) located on the present survey and which was visible during a 7 1/2 foot tide. A rock awash (2 feet at M.L.L.W.) was also located about 30 meters due north of that on the present survey on H 3969 W.D. (1916-17) which was inadvertently omitted in charting and furthermore, is incorrectly plotted (3 degree error in left angle) on the latter survey. Correct plotting, as recorded, brings the rock within 10 meters of that located on the present survey. The three rocks are undoubtedly one and the same rock. The rock as located on the present survey should be used for charting purposes.
- (3) The charted sunken rock in lat. $47^{\circ} 43.4'$, long. $122^{\circ} 38.3'$ which falls in depths of 18 feet on the present survey originates with Chart Letter No. 295 (1923) and is referred to as "about 150 yards offshore and 150 yards southeast of end of dock, has very little water over it at low water and is locally known to exist." The rock was also confirmed by a survey^{of 1915} by the State Engineer (see Director's acknowledgment attached to the above letter)*. The field party made a search for the rock during a 9 to 9 1/2 foot tide but were actually looking for it in a vicinity which is about 55 meters NNW of its charted position. The examination on the present survey is not considered sufficient for disapproval of the rock and it should therefore be retained on the chart pending the result of additional work after which a final disposition will be made.

Rock cleared by a 5 foot drag but not considered disproved. See Rev. (par. B-3) of Ad. Wk. (1936) attached to D.R. of H 5710. H.W.M. 2/5/37

* See H.R. Doc., 64-2, No. 1991.

b. Aids to Navigation

The three buoys shown on this survey in the vicinity of the wharves at Keyport are not shown on the chart.

8. Field Plotting

Field protracting and plotting of soundings were exceptionally accurate and conform to the requirements of the Hydrographic Manual.

9. Doubtful Soundings

The 20 foot single sounding (pos. 36 a blue) in lat. $47^{\circ} 41.5'$, long. $122^{\circ} 36.0'$ which was obtained between a 25 and 28 foot sounding appears to be a leadsman's error and should have been investigated in the field. Although the sounding was cleared with an effective drag strip of 21 feet on H 3969 (1916-17) W.D. this evidence is considered insufficient to disprove its existence and the 20 has been retained on the present survey.

10. Additional Field Work Recommended

In view of the fact that in several instances, the field examination was not considered sufficient adequately to disprove several reported rocks, and the proximity of such rocks to docks of commercial importance, a further examination is recommended of the following:

- a. The reported sunken rock discussed in paragraph 7 a, (1) of this review including the 9 foot sounding transferred from H 3763 (1915-17) approximately 180 meters to the NWxN.
- b. The reported sunken rock discussed in paragraph 7 a (3) of this review.

These items cleared by S to G test drag strip but not considered disproved. Sec Rev. (pars. B-5, B-4 and B-3 respectively) of Ad. Wk. (1936) attached to D.R. of H-5710.
H.W.M. 2/5/37

11. Superseding Previous Surveys

Within the area covered, the present survey with the indicated additions from previous surveys supersedes the following surveys for charting purposes:

H 1694 (1885)	In part
H 3763 (1915-17)	Entirely

12. Reviewed by - Harold W. Murray April 19, 1935

Inspected by - A. L. Shalowitz

Examined and approved:

C. K. Green

C. K. Green
Chief, Section of Field Records

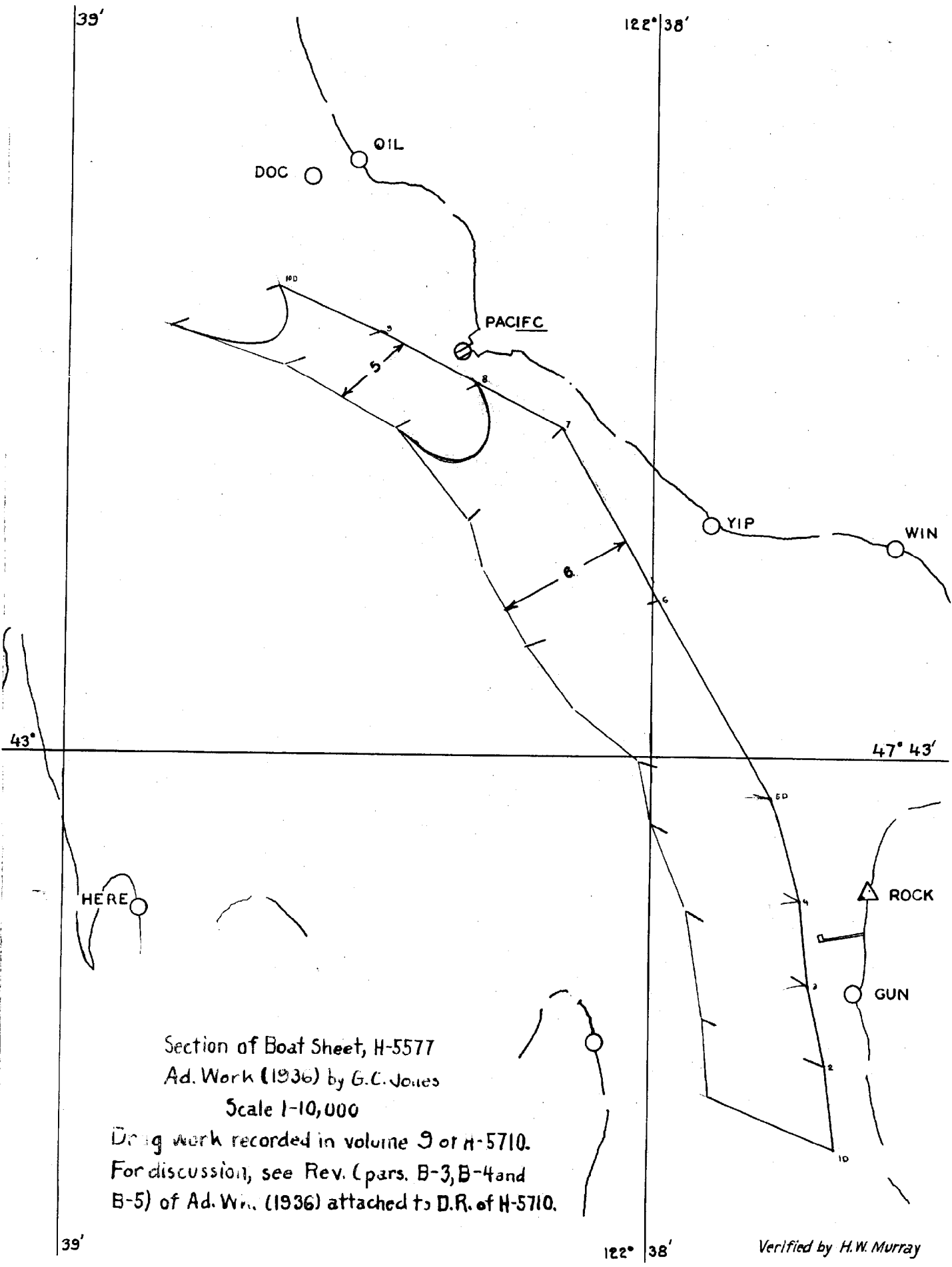
L. O. Gilbert
Chief, Division of Charts

H. Borden

Chief, Section of Field Work

G. Rude

Chief, Division of H. & T.



Applied to Cht. 6443 Feb. 24, 1937 K.R.
(Including Additional Work, 1936)
Applied to Cht. 6450 Apr. 20, 1937 K.R.

5710

(SEE D.R. For Addl Wk 1936)

5710

(SEE D.R. For Addl Wk. 1936)

Form 504
Rev. Dec. 1933
DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, Director

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 2
Hydrographic }

State Washington

LOCALITY

Puget Sound

Port Madison

193 4

CHIEF OF PARTY

Jack Senior

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 8 1935
REG. NO.
Acc. No. _____

HYDROGRAPHIC TITLE SHEET

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. 2.

REGISTER NO. **5710**

State Washington

General locality ~~Port Madison~~ Puget Sound

Locality ~~Puget Sound~~ Part Madison

Scale 1:10,000 Date of survey June to Sept., 19 34.

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by W. Weidlich

Soundings penciled by E. R. Willard

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by _____

Verified by _____

Instructions dated March 29, 19 34.

Remarks: _____

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 2,

PORT MADISON, PUGET SOUND.

- o -

JACK SENIOR, CHIEF OF PARTY, C. & G. S.

SEASON OF 1934.

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 2,

PORT MADISON, PUGET SOUND.

AUTHORITY:

The hydrography on this sheet was executed in accordance with the instructions of the Director, U. S. Coast and Geodetic Survey, dated March 29, 1934.

SCALE:

The scale is 1:10,000, and soundings are in feet.

LIMITS:

This survey covers the entire area known as Port Madison, connects at the eastern limits with hydrographic sheet No. 1, (1:20,000); south of Elder Point with hydrographic sheet No. 3, (1:10,000); and west at the east entrance of Agate Pass, with sheet No. 5, (1:10,000).

METHODS:

The approved methods of the Service were used throughout.

All launch work was performed with good fixes and the lines run North and South, generally on ranges, which will explain the lack of compass headings in the sounding volumes.

The launch "Delta" was used for all the work and the letter days are shown in red.

The lines in Squaib Bay, locally known as Millers Bay, run in various directions. This also applies to the long, narrow and winding bight at the north shore of Bainbridge Island, where the town of Port Madison is located.

The lines are spaced about 100 meters apart, with splits between, inside the ten fathom curve. In the bight near the southern shore, the lines are spaced much closer, especially at the entrance and in the narrow channel, which is used to a great extent by yachts and small fishing vessels.

South of Point Monroe, the lines run east and west, spaced one hundred meters apart with no splits between on account of the sudden drop in depth near the shore.

A ten pound hand lead was used in depths of less than fifteen fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire. All soundings are up and down.

CONTROL:

Triangulation and topography in advance furnished the necessary control.

TIDES:

An automatic portable tide gauge was in operation at the Port Madison wharf. All tide reducers were taken from its records covering the period during which the soundings were taken.

CHARACTERISTICS OF THE BOTTOM:

The bottom is muddy and sticky in the deeper water, rocky near the shores west of station "THOMAS", and sandy near the extensive flats in the immediate vicinity of Indianola, a summer resort at the north shores of the bay.

The bottom in vicinity of Point Monroe is sandy and extensive sand flats extend for some distance south of the point as far as Elder Point.

The bottom in the immediate vicinity of the east entrance to the long narrow bight, near station "MAD", is rocky near the shore and studded with numerous boulders which bare only at minus tides. The bottom in this bight is generally muddy and sticky with sand near the shore.

The bottom in Squaib Bay, is muddy and sticky, with occasional small boulders.

KELP:

This body of water is comparatively free of kelp with the exception of a small kelp patch about one hundred meters south of station "THOMAS", with a least depth found of eight feet at M.L.L.W.

A considerable amount of eelgrass was found near the sandy shores at the head of the small bays.

RESULTS:

This survey compares favorably with previous surveys and at some places the depths were only reduced a foot or two.

DANGERS AND OBSTRUCTIONS:

This area is free of rocks and obstructions which would be menace to navigation. A few rocks were located by topography east of station "INDI", but they are located close to the low water line.

The tide flats near the pier of Indianola, on which signal "PIER", is located, extends for some distance east of this pier.

Small passenger vessels arriving from Seattle, at low tides usually make a starboard landing at the west side of the pier, when coming from the opposite direction they make a port landing at the face of the dock, and when leaving, back on the after spring in order to avoid the flats.

A sixteen foot spot lies about 850 meters, 304° true from station "MAD", sandy bottom. Chart No. 6443 gives a depth of 17 feet in this vicinity. No further development was considered necessary, as the bottom is comparatively level. Pos. 13 to 14 a.

A shoal with a least depth found of 62 feet at M.L.L.W., lies about 1255 meters east of signal "FRI", Chart No. 6443 gives a depth of 65 feet in this locality. Bottom is sandy. Position l-m, gives the least depth obtained.

Attention is called to the ledge about 120 meters north of station "MAD". This ledge was sketched on the boat sheet as viewed by the hydrographer at minus tide.

ANCHORAGES:

The bight at the south shore offers excellent shelter, although at time southerly winds blow in here with considerable force. The channel at its center has a controlling depth of 14 feet and is used to a great extent by yachts and small fishing vessels. Numerous mooring buoys are placed by the owners of the yachts during the summer months at the anchorage.

The ruins of the mill wharf as mentioned in the Pacific "Coast Pilot", page 218, paragraph 1, are gone, and likewise the old shingle mill mentioned in the same paragraph.

Squaib Bay is used by shallow draft pleasure crafts which follow the buoys, placed there by private interests. The channel should not be used at low tides on account of the very irregular bottom. Depths of 6 and 7 feet at M.L.L.W., may be had north of the second buoy. Bottom is muddy and sticky.

Respectfully submitted,

W. Weidlich

W. Weidlich,
Mate, C. & G. S.

APPROVED AND FORWARDED:

Jack Senior
Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

Sheet approved.
J. Senior

CK

LIST OF STATISTICS

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 2.

Launch "Delta"

(1934) DATE	VOL.	DAY	STAT. MILES	POS.	SOUNDINGS HAND-MACH.	MILES & FROM WK.	TOTAL DIST. RUN
June 27	1	a	22.5	140	375	209	23.7
" 28	1	b	20.5	141	624	141	21.7
" 29	1&2	c	<u>20.1</u>	<u>124</u>	<u>390</u>	<u>197</u>	<u>20.9</u>
Total - June:			63.1	405	1399	547	66.3
July 1	2	d	18.8	124	502	125	20.1
" 2	2	e	21.7	139	362	239	20.9
" 9	3	f	6.0	79	436	---	21.6
" 31	3	h	<u>4.8</u>	<u>42</u>	<u>152</u>	<u>32</u>	<u>10.2</u>
Total - July:			51.3	384	1452	396	72.8
August 1	3	j	15.2	125	527	64	28.7
" 2	3&4	k	11.5	109	497	6	22.8
" 3	4	l	16.4	147	876	3	25.3
" 4	4	m	10.2	136	646	---	24.3
" 5	5	n	11.8	119	529	53	29.6
" 9	5	p	<u>4.3</u>	<u>44</u>	<u>52</u>	<u>60</u>	<u>6.3</u>
Total - August:			69.4	680	3127	186	137.0
September 20	6	q	3.3	18	----	44	3.9
Grand Total - Sheet #2:			187.1	1437	5968	1173	280.0

lae

TIDE NOTE FOR HYDROGRAPHIC SHEET

May 14, 1935

Division of Hydrography and Topography:

✓ Division of Charts: Attention Mr. E. P. Ellis

Tide Reducers are approved in
6 volumes of sounding records for

HYDROGRAPHIC SHEET 5710

Locality Port Madison, Washington

Chief of Party: Jack Senior *in 1934*
Plane of reference is mean lower low water reading
5.2 ft. on tide staff at Port Madison
11.5 ft. below B.M. #1-1934

Height of mean higher high water above plane of reference is 11.2 feet.

Condition of records satisfactory except as noted below:

Ham
Acting Chief, Division of Tides and Currents.

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. ...**5710**

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

Number of positions on sheet	1487 ...
Number of positions checked	112 ...
Number of positions revised	14 ...
Number of soundings recorded	7141 ...
Number of soundings revised	139 ...
Number of signals erroneously plotted or transferred	0 ...

Date: *July 5, 1935*

Verification by *G. K. Elderton*

Review by *[Signature]*

Time: 96 hrs.

Time:

Report on Hydrographic Sheet H-5710.

1. The records conform to the requirements of the General Instructions.

2. The manual depth curves can be completely drawn including portions of the zero curve.

3. The field plotting was completed as prescribed in the hydrographic manual.

4. It was not necessary to repeat any of the drafting done by the field party.

5. Junction with adjacent sheets were satisfactory. At this time sheet H-5709 has not been verified and the junction could not be made. However the field party plotted soundings from 52 to 699 from H-5709 on H-5710 and have been verified by the verifier.

6. A rock in Lat. 47-44.6, Long. 122-30.35 was shown on topographic sheet T-6260 as a rock awash having 4' at M.L.L.W. In the hydrographic records at pos 6k the rock was noted as awash with a 7' tide and was changed to agee on T-6260.

A rock was shown on the boat sheet in Lat. 47-42.5 Long. 122-31.46. There is no notation of this rock in the records and evidently this position was not recorded when located by the field party. A note in ink on the boat sheet states that it is awash with a tide of -2 feet and was plotted as a rock awash at M.L.L.W. on the sounder sheet.

Topographic signal GOF was frequently called GOF in the records. No change was made by the verifier.

The shoreline was checked from topographic sheet T-6260.

Respectfully submitted

Gordon K. Edubrin.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5710 (1934) - FIELD NO. 2

Port Madison, Puget Sound, Washington
Surveyed in 1934
Instructions dated March 29, 1934

Hand Lead and Machine Soundings.

3 Point Fixes on Shore Signals.

Chief of Party - Jack Senior.
Surveyed by - W. Weidlich.
Protracted by - W. W.
Soundings penciled by - E. R. Willard.
Verified and Inked by - G. K. Elderkin.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual, except that no topographic feature is shown at signal Jons (lat. 47° 41.58', long. 122° 32.63') and signal Em (lat. 47° 41.8', long. 122° 32.29') both of which fall outside the low water line. This matter has been referred to the field party.

*Temporary piles
See letter by
Chief of party
date Oct 17, 1935
attached to this
Descriptive Report.*

The "Descriptive Report is clear and comprehensive and satisfactorily covers all matters of importance.

*DL
Oct. 21, 1935*

2. Compliance with Instructions for the Project.

This survey complies with the requirements of the instructions for the project.

3. Sounding Line Crossings.

No system of cross lines was run, however the soundings on adjacent parallel lines are in satisfactory agreement.

4. Depth Curves.

The usual depth curves can be satisfactorily drawn.

5. Junctions with Contemporary Surveys.

The junction with H-5576 (1934) on the west at Agate Passage is satisfactory.

The junctions with H-5709 (1934-35) and H-5724 (1934-35) on the east and southeast are satisfactory.

6. Comparison with Prior Surveys.

a. H-1102 (1868).

This survey covers the entire area of the present survey. The development is about half as close as that on the present survey. The depths are in good general agreement.

Three sunken rocks in lat. $47^{\circ} 42.54'$, long. $122^{\circ} 31.42'$ shown in red (on H-1102 (1868)) fall just east of the rock awash located by the present survey and in depths of 3 and 4 feet. A faint pencilled note on H-1102 (1868) states that they were determined by Bradford in 1877. They have been charted since 1903. Because of no other record showing how they were located and the fact that the rock awash on the present survey shows the limit of the rocky ledge, these rocks should not be carried forward for charting purposes. They are probably a symbol for rocky bottom.

b. H-1338a (1875).

Only two or three soundings fall within the limits of the present survey and they are in satisfactory agreement.

c. H-3971 (1917).

This is a survey of Agate Passage and the inlet to the southwest of Port Madison on a scale of 1 to 5,000. The depths are in very good agreement with the present survey.

The wreck in lat. $47^{\circ} 41.71'$, long. $122^{\circ} 32.57'$ (charted) was not located by the present survey. Since there are no notes in the sounding volumes on a line running over and lines to either side of the charted location of the wreck, and since it was not mentioned in the Descriptive Report, it is probable that the wreck no longer exists. This matter has been referred to the field.

Wreck nonexistent. See letter by Chief of party dated Oct. 17, 35. Attached to this Descriptive Report.

[Signature]
Oct. 21, 1935.

d. H-3969 (1916-17) W. D.

Within the common area, the effective depth of the drag work is consistent with the depths obtained on the present survey except as follows:

- (1) In lat. $47^{\circ} 44.50'$, long. $122^{\circ} 30.25'$ an 18 foot drag apparently passed over depths of 9 to 17 feet on the present survey. An investigation of the plotting, however, indicates that a 10 degree error was made in the right angle,

which when changed eliminates a bump in the drag strip and also makes the drag depths consistent with the depths on the present survey. The plotting on H-3969 (1916-17) has been revised accordingly.

- (2) In lat. $47^{\circ} 44.35'$, long. $122^{\circ} 32.8'$ a 16 foot drag passed over depths of 5 to 11 feet on the present survey. An examination of the drag records discloses that this portion of the drag was controlled by a very weak fix and may not be in the position as plotted.

e. H-3970 (1917) Wire Drag.

A small portion of the wire drag work in Agate Passage overlaps the present survey. The effective depths of the drag are consistent with the present hydrography. The only soundings shown within the common area are supplemental hydrography and were not carried forward because they are deeper than the depths shown on the present survey.

7. Comparison with Chart No. 6443.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs and contains no additional information that needs consideration in this review.

8. Field Plotting.

The field plotting is satisfactory and conforms to the requirements of the Hydrographic Manual.

9. Doubtful Soundings.

The 48 foot sounding in lat. $47^{\circ} 44.50'$, long. $122^{\circ} 32.15'$ (pos. 59 to 60a) falls outside the 60 foot curve and in depths of approximately 76 feet and is considered of doubtful accuracy. The recorded depth is 7 fathoms, 3 feet and may have been a recorder's error and should have been 11 fathoms, 3 feet, which depth would agree with the general depths surrounding this spot and would also be in agreement with surrounding depths on the prior survey, H-1102 (1868).

Disproved. For discussion, see Rev. (par. B-1) of Ad. Wk. (1936) attached to D.R. of H-5710. H.W.M. 2/3/37

10. Additional Field Work Recommended.

This survey is complete and no additional work is required except an examination of the doubtful 48 foot sounding mentioned in the preceding paragraph.

Disproved. See note above.

11. Superseding Old Surveys.

Within the area covered the present survey, with the indicated additions from previous surveys, supersedes the following surveys for charting purposes.

H-1102 (1868) in part.
H-1338a (1875) in part.
H-3971 (1917) in part.
H-3969 (1916-17) Wire Drag, in part.
H-3970 (1917) Wire Drag, in part.

12. Reviewed by - Leo S. Straw, July, 1935.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green.
C. K. Green,
Chief, Section of Field Records.

L. O. Pollock
Chief, Division of Charts.

F. S. Borden
Chief, Section of Field Work.

G. H. Hude
Chief, Division of H. & T.

CKG
15

82-LEF

September 24, 1935.

To: Commanding Officer,
Coast and Geodetic Survey,
Ship EXPLORER,
601 Federal Office Building,
Seattle, Washington.

From: The Director,
U. S. Coast and Geodetic Survey.


Subject: Hydrographic Survey 5710 (Field No. 2).

Enclosed is a photostat of a section of your hydrographic survey 5710 (Field No. 2), Port Madison. It will be noted that signals JONS and EM are indicated on the photostat in yellow. The records contain no information regarding the topographic features on which these signals are located. Since they are in the water area, you will please advise this office as to their character, in order that they may be properly charted if of a permanent nature.

The photostat also indicates in yellow, the position of a wreck as shown on Chart No. 6443. The records contain no information regarding this wreck. You will, therefore, please advise as to whether or not the symbol should be continued in future charting.

(Signed) R. S. PATTON

Director.

Information received and applied


POST-OFFICE ADDRESS: 601 - Federal Office Building, Seattle, Washington.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY
U.S.C. & G.S.S. EXPLORER.

October 17, 1935.

To: Director, U. S. Coast & Geodetic Survey,
Washington, D. C.

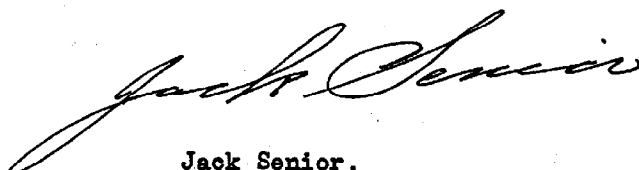
From: Commanding Officer, U.S.C. & G.S.S. EXPLORER,
Seattle, Washington.

Subject: Hydrographic Survey 5710 (Field No. 2).

Reference: 82 - LEF.

Survey signals "EM" and "JONS" are temporary
piles and should not be charted.

The wreck shown on chart #6443 is now non-
existent. The locality was visited by Mr. Weidlich at a
minus tide and no evidence of this wreck was visible.



Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

Information applied to sheet.

80
2-2/K/G/6
OCT 21 9:46

Applied to Cht. 6443 Mar. 26, 1937 K.P.
" " " 6450 Apr. 20, 1937 K.P.
" " " 6437 Aug 1942 B.T.
" " " 6445 Dec. 1946 L.A.M. vev. J.M.A.

25 Jan 16, 1936
L.A.S.

2505

5710

(Additional Work, 1936)

(Also Addl. Wk., 1936
on ten other Surveys)

5710

(Add'l Work 1936)

(Also Additional Work,
1936 on ten other
surveys)

H5711 ✓
H5724-
H5725-
H5846-
H5577-
H5930-
H5931-
H5932-
H6103-
H6108-
H6102-
H5844
H5845
H5846

Form 504
Rev. Dec. 1933
DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, DIRECTOR

DESCRIPTIVE REPORT

~~Topographic~~ } Sheets No. H5710 ✓ H5711 ✓
Hydrographic } H5724 ✓ H5725 ✓
H5846 ✓ H5577 ✓
H5930 ✓ H5931 ✓
H5932 ✓ H6108 ✓
H6102 ✓

State Washington

LOCALITY
PUGET SOUND

1936

CHIEF OF PARTY
G. C. JONES

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

HYDROGRAPHIC TITLE SHEET

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. Various

REGISTER NO H-5710, H-5711, H-5724, H-5725, H-6102, H-5846, H-5577, H-6103, H-6108, H-5930 to H-5932, inclusive. (Addl. Work, 1936)

State Washington

General locality Puget Sound

Locality See Descriptive Report of sheet involved

Scale Various Date of survey Aug. 29, to Oct. 29, 1936

Vessel Explorer

Chief of Party G. C. Jones

Surveyed by L. C. Wilder, W. Weidlich

Protracted by G. C. Mc-Glannon

Soundings penciled by G. C. Mc-Glannon

Soundings in fathoms feet

Plane of reference Mean Lower Low Water

Subdivision of wire dragged areas by

Inked by G. C. Mc-Glannon

Verified by G. C. Mc-Glannon

Instructions dated August 18, 1936, 19

Remarks:

DESCRIPTIVE REPORT

OF SUPPLEMENTAL WORK ON SHEETS

H-5710, H-5724, H-5577, H-5846
H-5711, H-5725, H-5930, H-5932
H-5931, H-6108, H-6103. H-6102

PARTY OF

U.S.C. & G.S. Ship EXPLORER

Lt. Comdr. G. C. Jones, Commanding

Supplemental instructions dated August 18, 1936,
22-AA, 1995 Ex 4.

1. Reference Paragraph 9, review H-5710.

The location of the doubtful sounding referred to in above review as well as the immediate neighborhood was carefully developed by sounding lines, detached soundings as nearly as possible on the exact spot and by drifting across using two leads. See pages 32 to 34 of record. The conclusion of the reviewer that the sounding originally shown was erroneously recorded was sustained and it is recommended that it be omitted.

2. Reference Paragraph 10, review H-5724.

Further examination was made as required. Approximately the same least depth was found as formerly. See pages 48 to 51 of sounding record and supplemental projection on boat sheet.

3, 4 & 5. References Paragraphs 7a (3) and 10b, 10a, and 7a (1) and 10a, all of review H-5577.

The officer who surveyed sheet H-5577, Lieutenant (j.g.) E. B. Lewey, was interviewed. From his statement it appeared that he had made a more thorough examination than indicated in the descriptive report and had visited the locality at low water at which time he could see bottom. As nothing further could be accomplished with the leadline, a short wire drag, set at ⁵/₆ feet effective depth, was taken over all three spots. Thus the existence of both sunken rocks was disproved and the 9 foot spot was covered with a 3 foot clearance. See pages 31 to 34 of wire drag record. It is recommended that the sunken rocks be omitted from the chart.

*These three items
not considered
disproved. For dis-
cussion, see Review
(pars. B-3, 4 & 5) of
Ad. Wk. (1936)
attached to D.R. of
H-5710.
H.W.M. 2/9/37*

6. Reference Paragraph 10a, review H-5846.

Additional soundings were taken as required. Original soundings were verified but no less water found. These soundings are on a sewer outlet. See pages 45 to 47 of sounding record.

7. Reference Paragraph 10b, review H-5846.

The additional split lines were run as directed. See pages 39 to 43 of sounding record.

8. Reference Paragraph 8a (2) and 10, review H-5711.

The wire drag examination called for was made. The lighted bell buoy was not lifted but the drag was towed at slack tide against the mooring chain from opposite directions with the Chief of Party standing by to make certain the chain was the object on which the drag grounded. The buoy was moved in each case by the wire striking the chain. Fixes were taken at the buoy both times which prove overlap of ^(Vol. 9) drag bight. See pages 27 to 29 of wire drag record, and page 7 of wire drag sounding record. ^(Vol. 8) Unfortunately, when records were being reduced for forwarding, it was found that an error had been made in the hookup and the effective depth was 30 feet instead of the 32 feet called for in the instructions. Since the 24 foot depth was disproved and redragging would involve the expense of a special trip to the field it was decided not to do so unless so instructed. It is recommended that the present 4 fathom sounding be changed to agree with the least depth found by the 1934-35 field party.

9. Reference Paragraph ^{band} 10, review H-5725.

Intensive development was done to find the 24 fathoms shown on boat sheet. It was not found. Soundings corresponded closely to surrounding depths of 30 and 31 fathoms. See pages 36 to 39 of sounding record. ^(Vol. 7) It is thought that this sounding was due to an error in fathometer work and it is recommended that it be omitted. ^{Note: Sdg obtained with machine.}

*Considered disproved.
See Rev. (Par. B-1).*

10. Reference Paragraph 10, review H-5725.

Allen Bank was dragged between the 10 and 20 fathoms curve as directed, also between the 10 and 50 fathoms curves.

Drag examination was impeded somewhat by the use of boatsheet soundings only roughly reduced for tide. It is believed that slightly less water was found in two spots but nothing of great importance. See pages 1 to 26 of wire drag record and pages 4 to 6 of wire drag sounding record. ✓

This drag work, as well as that described above, was not smoothplotted as only boatsheet information (signal location, etc.) was available. An overlay tracing of the three spots was made from the boatsheets showing the depths to which dragged. *Note: Tracing cut in 3 sections in office. Each section is attached to the D.R. of the affected smooth sheets. K.M.M.*

11. Reference Paragraph 8a (3) and 10, review H-5930.

Examination of rock at Olalla made as directed. Results of examination detailed on page 3 of sounding record. It is recommended that chart be made to conform thereto.

Rock confirmed, Survey 7' M.L.L.W.

12. Reference Paragraph 10, review H-5932.

Development of shoal and determination of extent of 5 fathoms curve made as directed. See pages 4 to 8 of record. ✓

13. Reference Paragraph 7a, review H-5931.

Reexamination to substantiate reports in 1930 and 1935 of nonexistence of rock made as directed. Rock was not found. See pages 9 to 13 of record. ^(Vol. 7) It is recommended that rock be removed from chart. ✓

14. Reference H-6108.

Additional split lines run as directed. ✓

15. Reference Paragraphs 7 and 10, review H-6103.

Elevation of highest point of Wyckoff Shoal redetermined as 3 feet. See page 18 of record.

^{H-6102} 16. In addition to above examination some additional lines were run in Hale Passage where last year's work was thought somewhat inadequate by the hydrographer, Lieutenant L. C. Wilder. The supplemental work was done without the aid of a boatsheet. See pages 15 to 17 of record. ✓

In addition to above descriptive notes see notes in record at time of sounding and typed notes in front of record made by hydrographer who is now on leave. (Vol. 7)


These notes considered by Reviewer. Apply to H-5930, 5931, 6102, 6108, 5932 and 6103 only. K.M.M.

TIDES:

In order to save additional expense for placing and leveling staffs and making observations, the tidal reducers for the above examinations were taken from curves deduced from observation at Tacoma and Seattle by applying corrections in accordance with available information. The curves are forwarded herewith.

See Remarks by Division of Tides for tides on Aug. 29 and 30, 1936 (page 7).

Respectfully submitted,


G. C. Jones,
Chief of Party, C. & G. S.,
Comdg. Ship EXPLORER.

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acc
TIDE NOTE FOR HYDROGRAPHIC SHEET

December 9, 1936.

Division of Hydrography and Topography:

✓ Division of Charts: **Att: Mr. E. P. Ellis**

Tide Reducers are approved in
3 volumes of sounding records for
and wire drag

HYDROGRAPHIC SHEET 5710 (Addl. Wk. 1936)

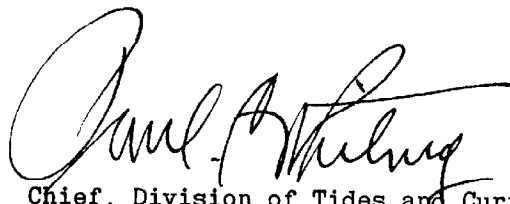
Locality **Puget Sound, Wash.**

Chief of Party: **G. C. Jones in 1936**
Plane of reference is **mean lower low water reading**
7.7ft. on tide staff at Seattle*
22.1ft. below B.M. 7

Height of mean high water above plane of reference is 10.5 ft.

*Soundings made on Aug. 29-30 were reduced in the field by observations at Tacoma. These observations have not yet been received at this office but a satisfactory check was made with Seattle observations. Soundings in different localities were reduced by Tacoma and Seattle observations by making allowance for the difference in time and range of tide.

Condition of records satisfactory except as noted below:


Chief, Division of Tides and Currents.

Field Records Section (Charts).

H5710 H5711 H5577
H5724 H5725 H5846
H5930 H5931 H5932
H6103 H6108

} Addl.
Work
1936

HYDROGRAPHIC SHEET NO.

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

Number of positions on sheets	310..
Number of positions checked	310..
Number of positions revised	..0...
Number of soundings recorded	1093.
Number of soundings revised	0....
Number of signals erroneously plotted or transferred	.Two

Date: 14 Jan., 1937

Verification by *B.C. McElmon*

Review by *transfer of sdgs,
drawing & inking
of depth curves* } by *H.W. Murray*

Review by *H.W. Murray*

Time: 8 days 6 3/4 hours

Time: 5 " 6 "

Time: 4 " 4 "

6

MEMORANDUM

IMMEDIATE ATTENTION

SURVEYS DESCRIPTIVE REPORT PHOTO STATIONS	}	Nos H Work	5700, 5711, 5725 5724, 5577, 5846 5930, 5931, 5932 6103, 6108 (Addl Work, 1936)	{	received Dec. 2, 1936 registered Dec. 4, 1936 verified reviewed approved
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This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
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RETURN TO

82	C. K. Green
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✓

1

14 January, 1937.

Report on Additional Work of
H-5710, H-5724, H-5725, H-5846, H-5930,
H-5931, H-5932, H-6102, H-6103, and H-6108.

1. This supplemental work was done on the original boat sheets in the field. All of it was plotted and protected on the smooth sheets in the office by the verifier. Soundings were inked in green where they were legible and no changes were made on the original survey. In complicated and congested areas an overlay tracing was made and none of the additional soundings were plotted on the original smooth sheets. Soundings from this supplemental work which plotted on or nearby ~~the~~ soundings of the original survey were left in pencil, or were shown by a leader to their respective places.

Additional soundings transferred to smooth sheet by reviewer.

2. The above work was done in $\frac{2}{\checkmark}$ this manner in order that the reviewer may study, compare, and determine which soundings to retain.

3. On each of the smooth sheets a note was made in green ink as follows:

"Additional work in green by S.C. Jones, Oct. 28, 1934. Recorded in volume 7 of H-5710." Thus an observer of the smooth sheet may determine exactly where the original records may be found. above note changed slightly in several instances by the reviewer. Xmas.

4. Positions 1b" and 2b", page 18, volume 7 of H 5710. These two positions are location of rocks on H 6103. The location of the rock at position 2b" does not agree with the location of the rock on the smooth sheet of the original hydrography. These rocks from T-6447 (1935), discrepancy very small. Xmas. This discrepancy may be due to shrinkage of the smooth sheet and again it may be an additional rock. Consequently it was left in pencil for final disposition by the reviewer.

5. In volume 7 of H 5710, pages 45-47 inclusive. This is additional work on H 5846. An overlay tracing was

The proposed position of this feature accepted. Xmas.

nodes and signal correction in 5
the records were made in blue
pencil to make the position
plott as shown on the boat sheet.

However, positions 14c' and 16c'
will not ^{tracing submitted by the field party.} plott as shown on the
boat sheet. Therefore both positions
were shown on the overlay as
plotted from the records and
as shown on the boat sheet
and marked accordingly. In any
case the additional work proves
that the original 12 foot soundings
were correct. The overlay shows
an 11 foot sounding where the
above 12 foot sounding was recorded.
6. The soundings in blue pencil
in volume 7 of # 5710 were
reduced by the verifier and
checked by Mrs Jackson.

These boat sheet plotting apparently correct & reading
in records accepted, 12/2/51

Respectfully submitted,
G. C. Mc. Glosson

Verification of Drag Work, H-5710, Ad. Wk. (1936)

1. H-5725.

Generally speaking, office verification of drag work was limited to inspection of groundings and plotting and inking of detached hand lead soundings at points of grounding.

2. H-5711.

In order to insure that the two drag strips on Bainbridge Reef (H-5711) possessed adequate overlap in the vicinity of the red buoy, it was necessary to check the drag work.

This revealed a number of inaccuracies which were due in part to using a tow line of 60 to 80 m. in length instead of 93 m. (see vol. 8, page 27 of H-5710). The entire drag work was therefore replotted in the office, a tracing of which is attached to the D. R. of H-5711.

3. H-5577

The work on this sheet was verified.

4. Verified by Harold W. Murray

Feb. 6, 1937

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. ADD'L WORK (1936): H-5710,
H-5724, H-5577, H-5846, H-5711, H-5725, H-5930, H-5932,
H-5931, H-6108, H-6103 and H-6102.

Puget Sound, Washington.

Surveyed in 1936

Instructions dated August 18, 1936 (EXPLORER)

Hand Lead and Machine Soundings 3 Point Fix is on Shore Signals.
Wire Drag

Chief of Party - G. C. Jones.
Surveyed by - L. C. Wilder and W. Weidlich.
Protracted by - G. C. McGlasson.
Soundings plotted by - G. C. McGlasson.
Verified and inked by - G. C. McGlasson.

A. Purpose of Additional Work.

The purpose of this additional work was to develop, verify or disprove a number of items discussed and called for in the reviews of various 1934-35 hydrographic surveys in this general locality.

B. Results of Additional Work.

The Descriptive Report and sounding records for this work have been filed with H-5710 (1934). The field work accomplished is shown on or filed with the affected Descriptive Reports. The order of discussion followed in this review is the same as that prescribed in the Instructions for the Project and adhered to in the Descriptive Report of the additional work.

1. Reference Par. 9 and 10; Review of H-5710 (1934).

Additional development in the vicinity of lat. 47° 44.5', long. 122° 32.15' discloses a uniformly changing bottom and no indication of the single 48 hand lead sounding obtained on line on the 1934 work, several depths varying from 65 to 69 feet being obtained directly over or close to the 48 foot sounding. As noted in the original review, the 48 is recorded as 7 fathoms 3 feet and should possibly have been 11 fathoms 3 feet which when reduced (72 feet) would agree more favorably with the surrounding depths. The 48 is considered as a recorder's error and has been removed from the smooth sheet.

2. Reference Par. 2 and 10; Review of H-5724 (1934-35).

Additional development of the 38 foot sounding in lat. $47^{\circ} 40.65'$, long. $122^{\circ} 25.0'$ discloses no critical shoaler depths other than several 37 foot depths obtained close by.

3. Reference Par. 7a(3) and 10; Review of H-5577 (1934).

The sunken rock (charted, chart 6443) in lat. $47^{\circ} 43.4'$, long. $122^{\circ} 38.3'$ which falls in depths of 18 feet was cleared by a single drag strip set at an effective depth of 5 feet. (Tracing of drag work attached to Descriptive Report of H-5577). The authority for charting this rock is quite definite, being referred to in Chart Letter 295 (1923) as having "very little water over it at low water and locally known to exist" and it is also shown on the State Engineer's survey of 1915 (H. R. Doc., 64-2, No. 1991). The Descriptive Report of the additional work, however, states that the hydrographer in 1934 "made a more thorough examination than indicated in his Descriptive Report and had visited the locality at low water at which time he could see bottom". It is to be noted in this connection, however, that the 1934 examination was made about 55 m. NNW of its charted position (see original review, par. 7a(3)). There is also a possibility that the rock was originally observed at extreme low tide (minus 4.5 feet noted in this area) in which case the rock may actually have 5 or 6 feet of water over it at MLLW and therefore the effective drag depth of 5 feet would not disprove its existence. The sunken rock should therefore be retained on the chart.

4. Reference Par. 10a; Review of H-5577 (1934).

The field party while investigating the rock discussed in paragraph B-5 of this review cleared the 9 foot sounding (lat. $47^{\circ} 42.8'$, long. $122^{\circ} 37.8'$) carried forward from H-3763 (1915-17) with a single drag strip set to an effective depth of 6 feet. (Tracing of drag work attached to Descriptive Report of H-5577). This effective depth insures safety to small craft navigating this locality.

5. Reference Par. 7a(1) and 10a; Review of H-5577 (1934).

The charted P. D. sunken rock (chart 6443) in lat. $47^{\circ} 42.8'$, long. $122^{\circ} 37.7'$ originating with Chart Letter 105 (1922) was cleared by a single drag set to an effective depth of 6 feet. (Tracing of drag work attached to Descriptive Report of H-5577). The Descriptive Report of the Additional Work (1936) states that the 1934 hydrographer "made a more thorough examination than indicated in his Descriptive Report and had visited the locality at low water at which time he could see bottom," however, as noted in the original review, some minor discrepancies in spotting of the rock resulted in the 1934 field party searching in an area approximately 60 m. northwestward of its most probable reported position. In view of the possibility that

the rock may have more than 6 feet of water over it and also the fact that it falls just within the eastern limits of the drag, the rock is not considered sufficiently disproved and it therefore should be retained on the chart in its corrected reported position (see original review, par. 7a(1)).

6. Reference Par. 10a; Review of H-5846 (1935). ✓

The single detached 11 and 12 foot soundings in lat. $47^{\circ} 36.8'$, long. $122^{\circ} 21.1'$ were confirmed. These soundings are on sewer outlets, depths about 1 foot shoaler being obtained in each case. The shoaler depths have been substituted for the previous 1935 depths.

7. Reference Par. 2 and 10b; Review of H-5846 (1935).

The shoal area or flat extending approximately 200 m. off-shoreward from the high water line (lat. $47^{\circ} 35.3'$, long. $122^{\circ} 20.8'$) was adequately developed, the resultant hydrography materially improving the delineation of the bottom and depth curves in this area.

8. Reference Par. 8a(2) and 10; Review of H-5711 (1934-35).

The reported 24 foot sounding (charted, chart 6444) which falls close to a least depth of 36 feet on the present survey (lat. $47^{\circ} 34.1'$, long. $122^{\circ} 31.0'$) and originates with information supplied by local residents (Chart Letter 119, 1899) to the effect that a reef exists here and "does not have more than 4 fathoms over it at low tide" was disproved, the 4 fathom sounding being cleared by wire drag to an effective depth of 30 feet. (See tracing of Drag Work attached to Descriptive Report of H-5711). The 24 foot sounding should be expunged from the chart.

The charted lighted buoy marking this area was located on the 1936 development approximately 45 m. south of its 1934-35 location and agrees more closely with the present charted position. Either position satisfactorily marks the feature intended.

9. Reference Par. 1b and 10; Review of H-5725 (1934).

Additional development in the vicinity of the 148 foot machine sounding in lat. $47^{\circ} 32.5'$, long. $122^{\circ} 27.7'$ discloses a least depth of 174 feet but no indication of the 148 foot depth. This development including that made by the 1934 hydrographer who also doubted the accuracy of the sounding (for further details, see original review, par. 1b) is considered sufficient evidence that the 148 is in error and it has therefore been expunged from the smooth sheet.

10. Reference Par. 10; Review H-5725 (1934).

The general vicinity of Allen Bank was dragged within the limits of the 10 to 20 fathom curve and extended in some cases, close to the 5 and 50 fathom curves. (See tracing attached to Descriptive Report of H-5725). The effective depths ranged from 20 to 54 feet throughout the area covered. Allen Bank in particular was dragged to effective depths ranging from 43 to 53 feet, the shoalest 1934 depths here being 52 feet on the SSW edge and 54 on the NNW. Hand lead investigation of a grounding in depths of 56 feet in lat. $47^{\circ} 31.4'$, long. $122^{\circ} 28.1'$ revealed a boulder strewn bottom with a least depth of 52 feet. The shoal area with least depth of 26 feet in lat. $47^{\circ} 30.9'$, long. $122^{\circ} 28.45'$ was also cleared to an effective depth of 21 feet.

A small portion of the above drag work overlaps the 1 to 10,000 scale hydrography on H-5711 (1934-35) and H-5930 (1935). No groundings were obtained nor does the effective depths conflict with the sounding development on those surveys.

Note: No smooth sheet was submitted by the field party for the drag work on Allen Bank. It was not deemed necessary to prepare one in the office. The area and depth tracing submitted by the field party has been accepted by the office without verification.

11. Reference Par. 8a(3) and 10; Review of H-5930 (1935).

The reported rock awash (charted, Chart 6460) at Olalla (lat. $47^{\circ} 25.3'$, long. $122^{\circ} 32.3'$) originating with Chart Letter 663 (1933) was confirmed. The rock bares 7 feet at MLLW and is closer inshore than previously indicated. The chart should be changed to agree with the present survey information.

12. Reference Par. 2 and 10; Review of H-5932 (1935).

The shoal area with a least depth of $4\frac{1}{2}$ fathoms in lat. $47^{\circ} 21.4'$, long. $122^{\circ} 28.9'$ was completely developed, a least depth of 4 fathoms being obtained about 30 m. WSW of the $4\frac{1}{2}$.

13. Reference Par. 7a; Review of H-5931 (1935) and 7a (4); Review of H-6102 (1935).

A closely spaced system of parallel lines and an examination of the immediate vicinity at a minus $\frac{1}{2}$ foot tide failed to reveal any evidence of the Evans Point sunken rock (charted, Chart 6460) originating with H-1426a (1878) with a least depth of $\frac{1}{2}$ fathoms and falling in general depths of 4 fathoms (lat. $47^{\circ} 17.2'$, long. $122^{\circ} 32.8'$). The original location of this rock is quite definite, being located by a 3 point

fix (pos. 2lu, red) at extreme low tide, described as "nearly perpendicular on the offshore side and rises to a bluff point" and a depth of $17\frac{1}{2}$ feet recorded as being on the "outside" side of the rock. In view of the definite assertions and investigations by the hydrographer of the present survey, the topographer of T-6445 (1935), the Superintendent of Lighthouses, 17th District (Chart Letter 252, 1930) and conversations with local residents (see review of H-5931, Descriptive Report of present survey and notes attached to flyleaf of Vol. 7, H-5710 for additional details), it seems evident that this rock does not now exist as a menace to navigation. It is possible that the rock was of loose formation and has rolled off into deep water. The sunken rock has been removed from H-5931 (1935). It should also be expunged from the chart.

14. Reference Par. 2, 5 and 10; Review of H-6108 (1935).

Additional split lines run in the vicinity of Nisqually Flats and Nisqually Reach resulted in a complete delineation of the depth curves in this area.

15. Reference Par. 7a, 7b and 10; Review of H-6103 (1935).

- a. The elevation of the highest of 3 rocks on the east side of Wyckoff Shoal (easternmost rock awash, lat. $47^{\circ} 14.2'$, long. $122^{\circ} 42.5'$) was actually measured (see note, pos. 2b", blue) and found to be $2\frac{1}{2}$ feet at MLLW. This agrees closely with the 1935 topographic determination of 2 feet T-6449) which was shown on the smooth sheet and should supersede the information on H-1445a (1879).

The elevation of the westernmost rock awash on Wyckoff Shoal (lat. $47^{\circ} 14.3'$, long. $122^{\circ} 42.7'$) originating with T-6449 (1935) was also confirmed by actual measurement (see note, pos. 1b", blue), both field parties determining an elevation of 3 feet at MLLW.

- b. The position of the 5 foot spot and accompanying shoal soundings on line 11 to 13x, red (lat. $47^{\circ} 13.1'$, long. $122^{\circ} 42.9'$) was disproved, the additional development showing a clear channel and uniformly changing depths which agree closely with those on H-1445a (1879). It was noted that a change in the left object would bring the original soundings into harmony with the additional work. Inasmuch as the latter fully covers the area, the original line of soundings has been rejected.

H-5710, Ad. Wk. (1936)-6

Two additional split lines, called for in letter of August 20, 1936 (attached to Descriptive Report, H-6103) were run to the southwestward at the junction with H-6106 (1935). These materially assist in an accurate delineation of the depth curves in this area.

16. Reference Par. 7b; Review of H-6102 (1935).

Additional lines run in the vicinity of the shoal area in lat. 47° 16.8', long. 122° 39.8' reveal that the area is broader and also has slightly less water.

This development, however, is not considered sufficiently extensive to disprove the 3 2/6 fathom sounding carried forward from H-1445a(1879) at the outer end of the shoal area. The 3 2/6 fathom sounding has therefore been retained on the present survey.

17. Reviewed by Harold W. Murray.

February 6, 1937.

Inspected by A. L. Shalowitz.

Examined and approved:

C. K. Green, Chief, Section of Field Records.	<i>C. K. Green</i> <i>L. O. Robert</i> Chief, Division of Charts.
<i>Fred. L. Peacock</i> Chief, Section of Field Work.	<i>G. Wade</i> Chief, Division of H. & T.

Applied to Cht. 6437 Aug. 1942.
Examined for 6445 insert Jan 1947

G.R.
J.M.D.

5711
(And Addl. Wk. 1936,
For which See 5710,
Addl. Wk. 1936 D.R.)

U. S. COAST & GEODETIC SURVEY
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Acc. No. _____

(And Addl. Wk. 1936,
For which SEE 5710,
Addl. Wk. 1936 D.R.)

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. PATTON, Director

State: WASHINGTON

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 4
Hydrographic }

LOCALITY

Yeomalt
~~YEOMALT~~ POINT TO COLVOS PASSAGE

~~INCLUDING RICH PASSAGE~~

PUGET SOUND

1934

CHIEF OF PARTY

JACK SENIOR

O'Melvaney - { Ver. & Inked - Vol I - Complete
Vol II - thru "d" day } 35³/₄ hrs.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 8 1935
REG. NO.
Acc. No. _____

HYDROGRAPHIC TITLE SHEET

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. 4

6450-2
6460-2

REGISTER NO. 5711

State Washington

General locality Puget Sound

Locality Yeomalt ~~Yeomalt~~ Point to Colvos Passage & Rich Passage
July 10th to Nov. 20th - 1934

Scale 1:10,000 Date of survey February 20, 1935

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by _____

Soundings penciled by _____

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by _____

Verified by _____

Instructions dated March 29, 1934

Remarks: _____

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 4
YEMOALT POINT TO COLVOS PASSAGE INCLUDING RICH PASSAGE
PUGET SOUND - WASHINGTON

- 0 -

JACK SENIOR, CHIEF OF PARTY
SEASON OF 1934

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 4

PUGET SOUND - WASHINGTON

AUTHORITY:

The hydrography on this sheet was executed under instructions of the Director, U. S. Coast and Geodetic Survey, dated March 29, 1934.

SCALE:

The scale is 1:10,000 and soundings are in feet.

LIMITS:

This area covers the west shores of Puget Sound from Yemoalt Point to Colvos Passage. It connects at Yemoalt Point with hydrographic sheet No. 3 (1:10,000); to the eastward with hydrographic sheets No. 1 and 8 (1:20,000), and west of Point Clover, Rich Passage, with hydrographic sheet No. 6 (1:10,000).

METHODS:

The approved methods of the service were used throughout, with a few modifications on account of the very irregular bottom of the Tyea Shoal, 5/8 mile south of Wing Point, and Bainbridge Reef at the south entrance of Rich Passage.

The launch "Delta" was used for all the work and the letter days are shown in red.

A ten pound handlead was used in depths of less than 15 fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire. All soundings are up and down.

In developing the above mentioned shoal and reef, regular sounding lines were discarded. Two handleads were used simultaneously and in numerous cases, three leadlines were used, the officer in charge taking active part.

The anchor was also used on the reef and set at a depth of about 6 fathoms in the hopes that it would fetch up on a much lesser depth. The anchor was also in use on the shoal and set at a depth of about 4 fathoms, making allowances for the tides.

Numerous soundings were taken but only the least depth obtained was recorded and plotted.

Although over 200 positions were taken at the Bainbridge Reef, on different working days, different tides and using different fixes, practically all positions are plotted on smooth sheets and three overlays.

It was also necessary to plot some of the positions on Tye Shoal on an overlay.

North of Restoration Point the lines run east and west spaced about 100 meters apart with splits between, extending well outside the 10 fathom curve. In Eagle Harbor and Port Blakely the lines run north and south and are spaced about 100 meters apart.

South of Restoration Point the lines run north and south, spaced from 100 to 200 meters apart, with splits between near the shores. As a rule these splits extend to the 20 fathom curve.

In Rich Passage the lines run east and west, and west of Clover Point, north and south. In this body of water the lines are spaced about 50 meters apart and the spacing of the soundings depended a great deal upon the strength and direction of the current.

South of Port Orchard Light, for a distance of about two miles, the lines run normal to the shore, spaced about 100 meters apart with splits between and join and overlap the lines which run north and south.

All sounding lines were run by ranges and no compass courses were used. All soundings are up and down.

Buoys were located by topography and hydrography. They are subject to small changes in position, due to current and tides.

Buoys No. 1 and 3 in Eagle Harbor were not located by sextant fixes, as they were out of position at the time the survey was in progress.

TIDES:

An automatic Portable tide gauge was in operation at the Winslow Shipyard Dock. All reducers were taken from its records covering the period during which the soundings were taken north of Restoration Point and its immediate vicinity.

For the work south of Restoration Point an automatic portable tide gauge was maintained at the end of the abandoned wharf of South Colby.

KELP:

The shore line, with a few exceptions, is fringed with more or less kelp. The kelp was found to be very thick north of Port Blakely Rock; at the north entrance to Port Blakely; in the immediate vicinity of Restoration Point; at the south shore of Bainbridge Island; Orchard Rocks; Point Clover; Orchard Point and south of Blake Island.

MUST BE GLOVER

An attempt to penetrate the latter kelp patch at low tides (to locate rocks) proved to be a failure as the kelp was too thick at that stage of tide. The launch was barely able to make any headway and it took some time to clear the propellor. There is no record of this, as it was done during thick, foggy weather, when it was impossible to do any regular hydrography. Some time later, at high tide, it was possible to make some headway through the kelp and a few additional soundings were taken. On March 9, 1935, while examining the area from the "Capon", this area was found to be free of kelp.

CONTROL:

Triangulation and topography furnished the necessary control for all the work.

CHARACTERISTICS OF THE BOTTOM:

The bottom is generally muddy and sticky in deeper water; rocky near the reefs and along the shore line and sand or gravel beaches between.

Off Yemoait Point the gravel beach drops off suddenly into much deeper water.

In Eagle Harbor and Port Blakely the bottom is muddy and sticky and uniform in depth, unless stated otherwise.



Very irregular bottom was found off Restoration Point, alternating, rocky, muddy and sandy.

In Rich Passage the bottom is muddy and sandy; rocky and sandy near the shores. On account of the heavy swell caused by the fast passenger vessels, the shore line changes some by erosion and no doubt also affects the depths.

The bottom is very irregular at Tye Shoal; Bainbridge Reef and in the vicinity of Orchard Rocks.

RESULTS:

This survey compares very favorably with previous surveys.

In some cases the depths were slightly reduced while at two very important places it was impossible to find the depths as shown on chart No. 6444, in spite of all efforts. *This paragraph evidently refers to depths on Tye Shoal and Bainbridge Reef. See par 7g (1) and par 8a (2) of review.*

North-north-east of Orchard Reef the depth was reduced by about 6 feet. This area was investigated on several working days as it lies in the old steamer track.

The fixes used in the immediate vicinity of triangulation station SOUTHWORTH, north of Southworth Point, are very weak. Although there are signals shown on the boat and smooth sheet south of signal MERD, they were not to be used as they might not have come on the smooth sheet.

DANGERS AND OBSTRUCTIONS:

1.

Wing Point Reef extends for about one-half mile in a south-easterly direction from Wing Point and bares at M.L.L.W. for about 330 meters and is marked by some kelp. The extreme end of the reef is marked by a red nun buoy.

2.

A spit which bares at minus tides extends for about 300 meters in a northerly direction from the extreme end of the Creosote Wharf and is marked by a black buoy (No. 3). This buoy was not located by the hydrographer as it was not in its proper position.

The spit also extends for about 320 meters in a north-easterly direction from signal DIO and the extreme end is marked by a black buoy (No. 1) which was not in proper position when the survey was in progress.

3.

Only a few soundings were taken west of the Creosote wharf, on account of this area being obstructed by numerous log rafts. However, it was possible to obtain soundings at the different cluster piles (Positions 88, 89, 90 and 91 "j").

4.

The bottom immediately north of the Creosote landing is very irregular and a 7 foot spot lies about 200 meters, 350° from the end of the landing (signal ON). The bottom east of the 7 foot spot drops off suddenly into much deeper water.

5.

Tyee Shoal marked by a bell buoy, shows a depth of 13 feet on chart No. 6444. Least depth obtained by this survey is 15 feet at M.L.L.W. In addition to the regular sounding lines, some development was done on "g" day, but not being satisfied with the results, this shoal was visited again on February 20, 1935.

One full hour was spent with two handleads in continuous use and with the anchor overboard at a depth of about 20 feet, drifting before the easterly winds and shifting position when drifting into deeper water.

*See par. 7g(1)
of review*

Although numerous soundings were taken, (at least several hundred) only least depths obtained were recorded and plotted. As this area is too crowded to show all the depths obtained, several positions are plotted on overlay tracings

The bottom was not visible and there was no indication of any kelp. Bottom is hard sand, clay and small rocks.

The 15 foot soundings plot practically on the same spot, about 735 meters, 88° from signal TYEE and about 70 meters north-east of the bell buoy. Positions 36 "g", 21, 22, 30, 32, 33, 35, and 36 "l".

6.

A 46 foot spot, sandy bottom, surrounded by a few deeper soundings lies about 1135 meters, $128\frac{1}{2}^{\circ}$ from signal TYEE. Position 86 "d".

7.

A rock of small extent, which bares one foot at M.L.L.W., lies about 230 meters, 175° from signal TYEE. Position 103 "d".

8.

A ledge extends for about 105 meters in an easterly direction from signal POHT at the north entrance to Port Blakely. This area is marked by very thick kelp during summer months and drops off into much deeper water.

9.

A rock covered one foot at M.L.L.W. lies about 220 meters, 337° from signal BLAKELY. The area north of Blakely Rock is foul and marked by very thick kelp. Position 101 "d".

The south end of Blakely Rock is steep and abrupt, fringed with some kelp and may be approached with safety within 50 yards.

10.

A ledge (Decatur Reef) bares for about 220 meters in south-easterly direction from Restoration Point and is marked by thick kelp, during the summer months. Shoal area, gradually deepening, extends for some distance and is marked by a gas and bell buoy in about 12 fathoms of water. Positions 15 and 16 "k".

The bottom of Restoration Point is very irregular.

11.

Bainbridge Reef, marked by a bell and light buoy, shows on chart No. 6444 and a depth of 24 feet. Least depth obtained by this survey is 36 feet, although several attempts were made to reduce the depth as indicated. Least depth found, lies about 650 meters south of signal CALF. Positions 35 and 36 "c". Rocky bottom, no kelp.

In addition to the regular sounding lines in area on "n" and "x" days, a few positions were taken on "z" day. These positions are not plotted as the depth obtained are of no real value and would only interfere with plotting of the more important ones.

*See review
par. 8a(2)
and par. 10*

A considerable amount of time was spent in this locality (3 hours and 20 minutes), 172 positions and a much larger amount of soundings were taken.

Two or three handleads were in use, virtually dragging the area and when anchored on the critical spots, the officer in charge took active part. Only least depths obtained were recorded and plotted.

Soundings were taken at different stages of tides, on "c" and "e" days with a two foot reducer and practically at slack water. The anchor was set at a depth of about 6 fathoms but never fetched up at a lesser depth. An improvised buoy was anchored on the 6 fathoms spot and soundings were taken around the marker by throwing the lead out as far as possible and then feeling the bottom.

*See review
par. 8a(2)
and par. 10*

That this area was covered sufficiently by the party until all means available were exhausted is proven by the fact that all shoal soundings, although taken on different working days; at different stages of tides and with different fixes, concentrate practically on the same spot.

It is the opinion of the author of this report that the existence of the 24 foot spot can only be proven by wiredragging the area, but it is doubtful as to whether or not a drag would be a success due to the fast ferry boats passing the buoy close on hand and causing at times a swell of about 6 feet, which would lift a drag over the obstruction.

Attention is also called to volume No. 12, page 37; position 29 "f". A small rock. Soundings aft of 38 and 39 feet; forward of 46 feet, a difference of 7 feet within a length of about 30 feet.

12.

The south shore of Bainbridge Island is studded with small boulders near the shore and as they are not a menace to navigation they are not enumerated in this report.

13.

A shoal with a least depth found of 15 feet at M.L.L.W., lies about 470 meters, $14\frac{1}{2}^{\circ}$ from signal SPINDLE. Chart No. 6444 shows a depth of about 20 feet.

(NNE from Orchard Rks)

The depth obtained lies between positions 101 and 102 "b". This area was covered on several working days. Several 17 foot soundings were obtained on "g" day (positions 63 and 64) in the immediate vicinity and a few splits were run on "k" day.

The area is marked by kelp in season; bottom is very irregular, rocky, sandy and clay. Bottom was not visible and no doubt subject to some changes on account of the heavy swells caused by the passing ferry boats.

14.

A 9 foot spot, rocky bottom, lies about 120 meters south of signal ECHO. Positions 41 to 43 "d". Additional soundings were taken in immediate vicinity the following day. Least depth found was 12 feet, positions 40 and 41 "e". Some kelp was noticed. (*South of Orchard Rks*)

15.

A shoal with a least depth found of 10 feet at M.L.L.W. lies about 225 meters, 284° from signal ARM. The bottom is sandy, marked by kelp and is surrounded by deeper water. (*East side of Rich Passage*)

16.

Foul area extends for some distance at Clover Point. A 23 foot spot lies about 140 meters, 68° from signal PLY and drops off suddenly to a depth of about 40 feet. A light and bell buoy placed in about 49 feet of water lies about 200 meters north of signal PLY.

17.

Foul area extends for about 65 meters east of Orchard Point. A 30 foot spot marks the extreme end. Position 41 "p". No attempt was made to penetrate the very thick kelp in this vicinity with the sounding launch.

18.

A 65 foot spot lies about 550 meters, 83° from Orchard Point. Position 90 "p". Additional development was done on "g" day but had to be given up on account of inclement weather and heavy tide rips causing the launch to ship too much water.

19.

The depths in Yukon Harbor were reduced a foot or more and a few additional soundings were taken in order to check the depths obtained while running regular sounding lines.

A 34 foot spot lies about 1065 meters, 122° from station COLBY. Positions 33 and 34 "q".

A 31 foot spot lies about 930 meters, ⁸139° from station COLBY. Position 12 "y". Two soundings of similar depths were obtained about 100 meters south of this position (3 and 4 "y").

A 31 foot spot lies about ¹²³⁰~~1160~~ meters, 139° from station COLBY. Position 30 "y".

A 25 foot spot lies about ¹²⁵⁰~~1160~~ meters, 155° from station COLBY. Position ~~19~~⁴ "q". Bottom is muddy and sticky.

TIDERIPS:

Heavy tiderips were encountered in Rich Passage and at the north entrance to Colvos Passage south of Blake Island.

The tiderips in Rich Passage were strongest at ebb tide with strong southerly winds and south of Blake Island with the flood and strong southerly winds.

On several occasions work had to be discontinued on account of the tiderips and work shifted to areas not affected by currents and winds.

CURRENTS:

No current stations were occupied in this area and no doubt all necessary data was obtained by previous current surveys.

The strength of current at the entrance to Rich Passage is estimated to attain a velocity of from 2 to 4 knots and increases in strength when approaching Clover Point where it may attain a maximum strength of 6 knots.

While working in this locality it became necessary at times to haul up from 4 to 6 points to keep the launch on the sounding line, sometimes making very little or no headway, again, in spite of the greatly reduced sounding speed of the launch, making too much headway, spacing the soundings farther apart than was originally intended.

WEATHER:

Smoky and hazy weather, delayed the field work a great deal, at times making it almost impossible to see large signals at a relatively short distance, especially when looking into the sun.

At the close of the season, rainy and squally weather, accompanied by strong southerly winds, was prevailing.

Respectfully submitted,

W. Weidlich

W. Weidlich,
Mate, C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Approved and forwarded,

Jack Senior

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

Sheet approved.

Please advise me whether a drag examination of Bainbridge Reef is desired, since it is not known if that area has already been dragged. (See review, par. 8a(2) and par. 10)

J. Senior

LIST OF STATISTICS

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 4

Launch "Delta"

(1934) DATE	VOL.	DAY	STAT. MILES	POS.	SOUNDINGS HAND-MACH.		MILES TO & FROM WK.	TOTAL DIST. RUN
July 10	1	a	17.7	176	529	112	3.6	19.0
" 11	1	b	17.7	172	847	35	3.0	18.6
" 12	2	c	14.3	195	660	57	3.1	15.7
" 13	2	d	<u>11.0</u>	<u>117</u>	<u>442</u>	<u>31</u>	<u>3.6</u>	<u>13.2</u>
Total - July:			60.7	660	2478	235	13.3	66.5
August 6	2&3	e	16.0	152	408	131	2.1	16.3
" 7	3	f	17.0	153	527	134	4.9	19.7
" 8	3	g	9.3	167	443	---	12.9	21.0
" 15	4	h	10.9	139	386	91	3.4	12.8
" 29	4	j	14.0	179	658	127	7.9	20.1
" 30	5	k	<u>8.3</u>	<u>82</u>	<u>159</u>	<u>127</u>	<u>5.5</u>	<u>12.7</u>
Total - August:			75.5	872	2581	610	36.7	102.6
September 4	5	l	5.6	38	66	83	5.6	10.6
" 5	5	m	17.6	152	347	211	4.1	19.6
" 6	5&8	n	20.8	115	183	272	4.0	21.9
" 7	6	p	18.5	131	309	195	2.0	18.1
" 8	6	q	18.3	157	513	142	2.8	18.7
" 10	7	r	15.0	149	614	89	5.6	18.6
" 11	7	s	17.7	159	669	46	2.0	17.4
" 12	7&8	t	11.6	106	346	101	7.0	17.1
" 13	8	u	10.6	123	395	31	1.7	10.9
" 21	8	v	6.8	59	---	59	1.0	6.0
" 23	8	w	7.9	80	339	32	10.0	16.9
" 24	8&9	x	16.1	146	280	190	4.8	18.8
" 25	9	y	14.3	125	239	159	5.7	18.1
" 26	9	z	16.0	145	580	44	4.2	18.7
" 27	10	a'	<u>13.0</u>	<u>128</u>	<u>525</u>	<u>19</u>	<u>6.0</u>	<u>17.3</u>
Total - September:			209.8	1813	5405	1673	66.5	248.7

(Continued On Next Page)

LIST OF STATISTICS

(Continued)

Launch "Delta"

(1934) DATE	VOL.	DAY	STAT. MILES	POS.	SOUNDINGS HAND-MACH	MILES TO & FROM WK.	TOTAL DIST. RUN
October 2	10	b'	12.3	103	438	15	16.7
" 3	10	c'	14.1	166	585	7	20.1
" 4	11	d'	10.5	90	309	67	15.1
" 5	11	e'	6.3	82	239	5	12.6
" 6	11	f'	8.1	146	269	30	20.0
" 7	11&12	g'	16.4	194	245	172	20.0
" 8	12	h'	17.9	152	429	192	23.5
" 9	12	j'	<u>11.6</u>	<u>132</u>	<u>488</u>	<u>74</u>	<u>15.3</u>
Total - October:			97.2	1065	3002	562	143.3
November 20	12	k'	0.5	10	36	---	0.6
(1935)							
February 20	12	l'	2.0	37	37	---	4.7
Grand Total - Sheet #4:			445.7	4457	13539	3080	566.4

RCC

TIDE NOTE FOR HYDROGRAPHIC SHEET

June 17, 1935.

Division of Hydrography and Topography:

✓ Division of Charts: Attention Mr. E. P. Ellis

Tide Reducers are approved in
12 volumes of sounding records for

HYDROGRAPHIC SHEET 5711


Locality Yemoalt Point to Colvos Passage, Puget Sound, Wash.

Chief of Party: Jack Senior in 1934
Plane of reference is mean lower low water reading
6.9ft. on tide staff at Eagle Harbor
15.7ft. below B.M. 3 (1924)

4.0 ft. on tide staff at South Colby
16.5 ft. below B. M. 1a (1934)

Height of mean high water above plane of reference is 10.6 ft. at
Eagle Harbor; 10.7 ft. at South Colby.

Condition of records satisfactory except as noted below:


Chief, Division of Tides and Currents.

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. 5711

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

Number of positions on sheet	4457
Number of positions checked	205
Number of positions revised	0
Number of soundings recorded	16619
Number of soundings revised	0
Number of signals erroneously plotted or transferred	0

Date: Aug. 30, 1935

Verification by O'Melvaney - 35 3/4 hrs.
J. Levine - 12 1/2 hrs.

Time: 165 1/4 hrs.

Review by

R. L. Johnston

Time: 63 hrs.

H-5711 (Partial Report)

The records conform to the requirements of the General Instructions.

No depth curves have been verified or drawn.

The field plotting was completed to the extent prescribed in the Hydrographic Manual. (This applies to soundings only since the topography has not yet been compared with the topo. sheets)

The office draftsman did not have to revise any of the work done by the field party. (This also applies to soundings only; other work not yet verified.)

Junctions with contemporary adjacent sheets not made.

All records pertaining to this survey are now in this office with the exception of the following:

Special charts for L.H.

Recoverable Stations - Form 524

J. Levine

Aug. 30, 1935

These rocks changed to rocks awash at M.H.W.

R.L.

all the above uncompleted work has now been completed. Attention is called to two bare rocks inside the low water line south of sig. "Blood" at lat $47^{\circ}34.45'$ long. $122^{\circ}30.82'$. They are shown on T-6262 (1934) as bare rocks with the note "aw." altho they could correctly be shown on the smooth sheet as rocks awash at M.H.W., they have been left unchanged since they are within the L.W. line and are not a danger. Ho. Add. Vol. 13.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5711 (1934-5) FIELD NO. 4

Yeomalt Pt. to Colvos Passage, Puget Sound, Washington
Surveyed in July - Nov. 1934 and Feb. 1935
Instructions dated March 29, 1934 (EXPLORER)

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - Jack Senior.
Surveyed by - W. Weidlich.
Protracted by - W. Weidlich.
Soundings penciled by - W. Weidlich.
Verified by - J. Levine.
Inked by - J. L. and O'Melvaney.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual.

The Descriptive Report is clear and comprehensive and adequately covers all matters of importance.

The Chief of Party's note at the end of the Descriptive Report regarding the desirability of dragging Bainbridge Reef, should have been the subject of a separate letter at the time of the field work.

Authorized and dragged. See note, par. 10, this review.

2. Compliance with Instructions for the Project.

This is an excellent survey and fully complies with the instructions for the project.

3. Shoreline and Signals.

The shoreline and locations of topographic signals are from plane table surveys T-6262 (1934), T-6263 (1934) and T-6267 (1934).

4. Sounding Line Crossings.

No general system of cross lines was run. However, those that result from the work as well as adjacent parallel lines are in good agreement.

5. Depth Curves.

Within the limits of the survey, the usual depth curves may be satisfactorily drawn, including most of the low water curve.

6. Junctions with Contemporary Surveys.

The junction on the north in Puget Sound with H-5724 (1934-5) is satisfactory.

The junctions in Puget Sound on the east with H-5709 (1934-5) and H-5725 are satisfactory.

The junction in Rich Passage on the west with H-5652 (1934) is satisfactory.

The junction with the work to the southward in Colvos Passage will be considered when received in the office.

7. Comparison with Prior Surveys.a. H-525 (1856).

This survey, on a scale of 1:10,000, covers the area in the vicinity of Blakely Harbor. It is not in close agreement with the present survey. However, it is a preliminary survey and should be considered as reconnaissance. The information shown has been superseded on the charts by later surveys and this survey needs no further consideration.

b. H-1337a (1875) and H-1338a (1875).

These surveys, on scales of 1:10,000 and 1:40,000, cover the area in Puget Sound north of Restoration Pt., including Eagle and Blakely Harbors. They are in fair agreement with the present survey. However, most of the information shown has been superseded on the charts by later surveys, except in the deep areas. The rock awash symbol (charted on chart No. 6444) about 210 meters north of the light on Blakely Rock (triangulation station Blakely 2 (1934)) falls on a 5 foot rock on the present survey which located a rock awash at M. L. L. W. about 70 meters westward. The present hydrographic location of the new rock awash (pos. 101d) checks perfectly with the position determined by topography T-6262 (1934). The old rock awash originates with a minus 2-1/2 foot sounding on H-1337a (1875), which is a single sounding on a line (pos. 16 b to pos. 17 b) run when there was about 8 feet of tide. The 5 foot rock on the present survey was located by a strong fix when there was only 1/2 foot of tide. (pos. 100 d) The minus 2-1/2 foot sounding is believed to be either incorrect or out of position and the rock awash symbol should be superseded on the chart by the delineation of rocks shown on the present survey.

c. H-1425a (1877-8).

This survey, on a scale of 1:20,000, covers the area south of the south end of Bainbridge Island. It is in fair agreement with the present survey and shows no outstanding features which need be retained.

d. H-1694 (1885).

This survey, on a scale of 1:20,000, covers the area in Rich Passage northwest from Orchard Rocks. It is in fair general agreement with the present survey, except as follows:

- (1) The 33 foot sounding (charted) at lat. $47^{\circ}35.84'$, long. $122^{\circ}32.87'$, falls in depths from 38 to 47 feet on the present survey. This sounding, on the line between pos. 47 Q and pos. 48 Q, was found to be incorrect. It should have been $8\text{-}1/4$ fathoms and the 33 should therefore be removed from the chart.
- (2) The 18 foot spot (charted) southeast from Orchard Rocks at lat. $47^{\circ}34.58'$, long. $122^{\circ}31.75'$ originates from a 17 foot sounding which is actually 19 feet at M.L.L.W. The 17 is an intermediate sounding in a long line of 22 soundings on which no time was recorded. (Pos. 42 j to pos. 43 j). It falls in depths of 40 feet on the present survey which shows 18 foot soundings about 70 meters westward. The entire line on which the 17 appears is in poor agreement with the present depths. Two well located soundings (pos. 25 P and pos. 84 P) which were taken later but were not plotted on H-1694 (1885) showed depths of 37 and 46 feet directly over the 17. For this reason and because of its poor agreement with the present depths, the line containing the old 17 foot sounding is believed to be out of position. It should be disregarded in future charting and the 18 foot spot, originating from it, should be removed from the chart. The present survey adequately covers the common area and should supersede H-1694 (1885) because of its larger scale and greater detail.

e. H-2379 (1899).

This is an examination of Bainbridge Reef on a scale of 1:10,000. The least depth shown is $5\text{-}1/2$ fathoms, however, there is some uncertainty regarding it because no plane of reference could be procured. This survey has been superseded for charting purposes.

f. H-2483 (1900).

This survey, on a scale of 1:10,000 covers the western part of the present survey from Rich Passage as far south as lat. 47°33'. It is in fair general agreement with the present survey with the following exceptions:

- (1) The 21 foot sounding (charted) at lat. 47°34.52', long. 122°31.9' falls in a blank area on the present survey. However, the surrounding soundings agree with the present ones. The presence of a shoaling at this point is borne out by several shoal soundings adjacent to the 21, which has been carried forward and should be retained on the chart.
- (2) The 18 foot sounding (charted) at lat. 47°34.7', long. 122°31.9' falls between soundings of 21 and 22 feet on the present survey. It is a single sounding on a line (pos. 11 h to 12 h). However, the area was not closely covered by the present soundings and the 18 has been carried forward.
- (3) The 39 foot sounding (charted) at lat. 47°35.6', long. 122°33.65', falls at the western limits of the present survey at the junction with H-5652 (1934) in depths from 63 to 69 feet. It is a single undeveloped sounding on the regular system of lines and was recorded as 7 fathoms 1 foot. (Pos. 10 1 to 11 1). If this is changed to 11 fathoms 1 foot, assuming that the recorder misheard the leadsman, the depth would be in close agreement with the present survey. Although no special examination of this shoal was made on either H-5652 (1934) or the present survey, the depths in the vicinity show a regular bottom. The 39 foot sounding should be disregarded in future charting.
- (4) The 32 foot sounding (uncharted) at lat. 47°35.3', long. 122°32.45', is the shoalest depth on a long ridge in the center of Rich Passage. This ridge has been dredged out (See chart letter 96 of 1928 and blue print 21816 of 1928), and the present survey shows minimum depths of 40 to 42 feet on this ridge. The soundings shown on this ridge on this survey should be disregarded in future charting.

Because there is evidence that some of the areas covered by H-2483 (1900) have changed somewhat, this survey, except for the soundings carried forward, should be superseded by the present survey within the common area.

g. H-3373 (1912).

This survey, on a scale of 1:5,000, covers the area of Eagle Harbor and approach. It is a fairly close survey containing both topography and hydrography. However, since no triangulation was accomplished, there is no projection on the sheet. Topographic revision done in 1933 by the party of A. M. Sobieralski (attached to Descriptive Report of H-3373 (1912) now makes it possible to construct an approximate projection. Within the area of Eagle Harbor the hydrography shown on this survey is in agreement with the present depths. However, the spit making south from triangulation station Wing (lat. $47^{\circ}37.25'$, long. $122^{\circ}29.45'$) and terminating in Tyee Shoal appears to have changed considerably.

- (1) The 13 foot sounding (charted) on Tyee Shoal at lat. $47^{\circ}36.62'$, long. $122^{\circ}29.2'$, is a single sounding on a line (pos. 13a to pos. 14a) and no special examination was made of this shoaling. Some of the soundings surrounding the 13 do not agree with the present depths and the general shape of the shoaling was changed. The present survey obtained a least depth of 15 feet after a very thorough development by drift soundings on two different days. In view of the general changes in the spit of which this shoal is the extremity and because of the intensive character of the present examination, the 15 foot sounding from the present survey should be accepted and should replace the old 13 on the chart.
- (2) The 13 foot sounding (charted) at lat. $47^{\circ}36.9'$, long. $122^{\circ}28.94'$ falls between depths of 17 to 18 feet on the present survey. Although there have been changes in the shape of the spit in this vicinity, the present soundings indicate that this shoaling has persisted. The 13 has, therefore, been carried forward and is the only sounding retained from this survey. H-3373 (1912) should be superseded by the present survey.

h. H-3956 (1917).

This survey, on a scale of 1:2,500, shows several lines running from triangulation station Middle, lat. $47^{\circ}34.65'$, long. $122^{\circ}32.6'$, to the southwestern end of Bainbridge Island, and several lines between Orchard Point and the southern end of Bainbridge Island. No Descriptive Report was submitted with this survey, which appears very incomplete and is apparently more in the nature of a reconnaissance. The soundings are in fair agreement with the present depths but as the survey furnishes no additional information, it should be superseded by the present survey, which adequately covers the common area.

i. H-3764 W.D. (1915), H-3765 W.D. (1915-7), H-3972 W.D. (1917).

These wire drag surveys cover the area in Rich Passage and south of Bainbridge Island. The effective depths of the drag are consistent with the soundings of the present survey. The critical soundings found by the drag have been added to the present survey. However, those drag soundings deeper than the present depths were omitted in congested areas.

8. Comparison with Chart No. 6444 (New Print dated Sept. 3, 1935), Chart No. 6450 (New Print dated Jan. 9, 1936), and Chart No. 6460 (New Print dated June 8, 1934).

a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs, except as follows:

(1) In a small area in Rich Passage some of the charted soundings originate from the U. S. Engineers' survey of 1928, blue print 21816. (See par. 7 f (4) of this review). The blue print is in general agreement with the present survey but should now be superseded by the latter.

(2) The 24 foot sounding charted on Bainbridge Reef at lat. 47°34.1', long. 122°31.0', originates with Chart letter No. 119 of 1899. The letter, from an officer of the U. S. Engineers, states that the writer was informed by two residents of the locality of the existence of this reef which "does not have more than 4 fathoms over it at low tide". The present survey obtained a least depth of 36 feet after a very intensive examination by drift soundings and prior surveys show similar depths. This shoal was cleared by the wire drag set to an effective depth of 22 feet at M. L. L. W. (H-3765 W.D. 1915-7) which obviously does not disprove the 24. While it is realized that the estimated 24 may be incorrect, it should be retained on the chart pending another examination by wire drag.

24' spot cleared by 30' drag. See tracing attached to this R.A. For discussion, see Rev. Copy B-8) of Ad. Wk. (1936) attached to D.R. of H-5710. H.W.M. 2/5/27

b. Aids to Navigation.

The buoys were located in substantially the same position as charted with the exception of red buoy N8, in Rich Passage, which was located about 120 meters east of its charted position. All of the buoys, however, correctly mark the intended features.

The two private buoys in Eagle Harbor are not shown on the chart. The Commanding Officer of the Steamer SURVEYOR recommends that these buoys be charted as mooring buoys. "Large vessels come to the shipyard and positions of these buoys on the chart would assist in maneuvering near the dock". (See letter attached to Descriptive Report of H-3373 (1912)).

9. Field Plotting.

The prescribed amount of field plotting was neatly and accurately done. This work is very satisfactory.

10. Additional Field Work Recommended. Immediately Necessary.

This survey is complete and satisfactory, however, the following examination with a short wire drag should be accomplished. The 24 foot sounding charted on Bainbridge Reef should be verified or definitely disproved. (This sounding discussed in par. 3a (2) of this review). The drag should be set to an effective depth of at least 32 feet.

24' sdg cleared
by 20' drag.
Sog tracings
attached to
this D.R. also
re. (par. 3-
8) of Ad. Wk.
(1934) attach-
ed to D.R. of
H-5710.
H. W. M. 2/5/37

11. Superseding Old Surveys.

Within the area covered the present survey, with the indicated additions from previous surveys, supersedes the following surveys for charting purposes:

H-525 (1856)	entirely	H-2379 (1899)	entirely
H-1337a (1875)	in part	H-2483 (1900)	in part
H-1338a (1875)	in part	H-3373 (1912)	in part
H-1425a (1877-8)	in part	H-3956 (1917)	entirely
H-1694 (1885)	in part		

12. Reviewed by - R. L. Johnston, Dec. 11, 1935.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

L. O. Pollock
Chief, Division of Charts.

F. S. Borden
Chief, Section of Field Work.

G. W. Wade
Chief, Division of H. & T.

Applied to Cht. 6444 Oct. 28, 1936 K.R.
(Including additional work of 1936)
Applied to Cht. 6460 Apr. 19, 1938 K.R.

25 Jan 17 1936

5724

(And Addl Wk. 1936,
For which SEE 5710,
Addl. Wk. 1936)

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

APR 19 1935

Acc. No. _____

5724

(And Addl Wk. 1936,
For which SEE 5710,
Addl Wk. 1936 D. R.)

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. PATTON, Director

State: WASHINGTON

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 3. 5724
Hydrographic }

LOCALITY

FOOT MADISON TO ELLIOTT BAY

PUGET SOUND

West Point & Vicinity &
Skiff Point & Vicinity

1934

CHIEF OF PARTY

JACK SENIOR

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 19 1935
REG. NO.
Acc. No. _____

HYDROGRAPHIC TITLE SHEET

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. 3

REGISTER NO. **5724**

State Washington

General locality Puget Sound

West Point and Vicinity and Skiff Point and Vicinity
Puget Sound.

Locality Port Madison to Elliott Bay - E. & W. shores of /

Scale 1:10,000 Date of survey Aug. to Dec., 1934
February 20, 19 35

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by W. Weidlich

Soundings penciled by J. F. Ward

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by L. B. BERES+

Verified by L. B. BERES

Instructions dated March 29, 1934.

Remarks: _____

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 3
INSHORE HYDROGRAPHY FROM PORT MADISON TO ELLIOTT BAY
EAST AND WEST SHORES OF PUGET SOUND

WASHINGTON

- 0 -

JACK SENIOR, CHIEF OF PARTY
SEASON OF 1934

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 3

PUGET SOUND - WASHINGTON

AUTHORITY:

The hydrography on this sheet was executed under instructions of the Director, U. S. Coast and Geodetic Survey, dated March 29, 1934.

SCALE:

The scale is 1:10,000 and soundings are in feet.

LIMITS:

The inshore hydrography on this sheet covers the area from Meadow Point to about half a mile south of Four Mile Rock Light at the east shore and from Elder Point to Yemoalt Point at the west shore of Puget Sound. It connects at the north with Sheet No. 1 (1:20,000), at Elder Point with Sheet No. 2 (1:10,000); south of Yemoalt Point with Sheet No. 4 (1:10,000); east of Four Mile Rock with Sheet No. 10 (1:5,000) and at the south limits with Sheet No. 8 (1:20,000).

This work also connects and overlaps with the survey executed by the Str. EXPLORER on Sheet No. 1.

METHODS:

The approved methods of the service were used throughout.

All launch work was performed with good fixes and lines were run east and west, which will explain the lack of compass headings in the sounding volumes

The launch "Delta" was used for all the work and the letter days are shown in red.

The lines are spaced 100 meters apart with splits between near the shore where much closer development was required on account of the natures of the bottom. An exception was made for about half a mile south of Elder Point where the bottom drops off suddenly into much deeper water.

A ten pound hand lead was used in depths of less than 15 fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire was used. All soundings are up and down.

Due to the carelessness of one leadsman, who was promptly relieved, there are several soundings which required additional development and for further information see "Dangers and Obstructions".

CONTROL:

Triangulation and topography furnish the necessary control.

South of West Point numerous signals were destroyed by people frequenting the beaches and they were rebuilt and cut in by sextant fixes. These cuts did not check any too well and consequently all signals were relocated by topography at a later date eliminating all cuts recorded in Volume No. 2, page 64 and Volume No. 4, page 72.

TIDES:

All tide reducers were taken from the records of the standard tide gauge maintained by the Seattle Field Station at the foot of Madison Street, Seattle, Washington.

KELP:

The extensive flats between West Point and Four Mile Rock are marked by thick kelp during the summer months and eel grass grows profusely at the west shore of Puget Sound.

CHARACTERISTICS OF THE BOTTOM:

The bottom generally is muddy in deeper water, sandy near the flats and rocky at the north shore of West Point.

Very irregular bottom exists at the entrance to Lake Washington Canal.

RESULTS AND COMPARISONS:

On account of the scarcity of Soundings on Charts No. 6447 and 6449, a comparison cannot be made, neither does this survey reveal anything which may be considered a menace to navigation. ✓

DANGERS AND OBSTRUCTIONS:

The east shore of Bainbridge Island is free of outlying dangers and a few boulders near the shores were located by topography. Extensive mud and sand flats extend for some distance from the shore diminishing in width when approaching Skiff Point. ✓

At Skiff Point the flats extend for about 250 meters in an easterly direction, dropping off suddenly into much deeper water. ✓

Yemoalt Point may be approached close to at a safe distance of about 100 yards, the gravel beach at that point extends for only a short distance, dropping off into comparatively deep water. ✓

Lake Washington Canal Entrance

#1.

A sounding of a very doubtful nature, 217 foot 217 feet at M.L.L.W., was obtained about 1500 meters, 248° from triangulation station MEADOW. A few additional soundings were taken the next day in this vicinity, giving much greater depths. Position 119 "g" and "h" day. ✓
sounding rejected in records J.G.L.

It is assumed that the registering sheave was mis-read by about 10 fathoms.

#2.

Three doubtful soundings were obtained between positions 31 and 32 "g" and they are not penciled on the smooth sheet. ✓
rejected in records J.G.L.

This line was re-run on the following day, obtaining much greater depths. It is taken for granted that the soundings in question are incorrect and it is recommended that they should be rejected. Latitude 47° 41' N., Longitude 122° 25' W. ✓
rejected in records J.G.L.

#3.

The bottom is very irregular about 275 meters west of the channel buoy No. 1. The line begins at position 24 "f" with hand lead and continues until the end of the line. ✓

In order to develop this area additional soundings were taken the following day using the steam sounding machine entirely, on account of the much greater depths obtained. Positions 102 to 114 "h". ✓

This area was further developed on "v" day, February 20th, 1935, with the result that much shoaler soundings were obtained immediately south of the line in question. ✓

It is recommended that the soundings between positions 24 and 25 "f", be retained, but reject the sounding on position 24 "f", as all soundings around this particular spot show much greater depths.

Not all positions of "h" day are plotted as they would greatly interfere with the shoaler soundings. ✓

A 38 foot spot lies about 500 meters, 271° from triangulation station CANAL ENTRANCE LIGHT (CHAN) and is surrounded by much deeper water. Positions 19 to 20 "v". ✓

#4.

The dredged channel marked by spar buoys has a controlling depth of 32 feet at its center. In addition to the regular sounding lines, three lines were run in direction with the channel. ✓

#5.

A rock covered 3 feet at M.L.L.W., lies about 235 meters west of signal SEW. Position 25 "j". ✓

#6.

The area between signals BIG and STU is studded with numerous boulders which bare at low tides. Signal BIG is a large prominent boulder which bares about 5 feet at high tides. ✓

#7.

A spit which bares for about 170 meters at M.L.L.W. extends in a westerly direction from station ✓

WEST. Shoal water extends for some distance from the point and is marked by a black spar buoy about 400 meters, 237° from triangulation station WEST, in a depth of 29 feet. ✓

#8.

Extensive sand flats lie between West Point Light and Four Mile Rock Light. These flats extend for 170 to 550 meters offshore, gradually diminishing in width towards Four Mile Rock. During the summer months these flats are fringed with very thick kelp. ✓

WEATHER:

Smoky and hazy weather delayed the work a great deal while working near the east shore, making it almost impossible at times to see the largest signals during the early morning hours. ✓

Respectfully submitted,

W. Weidlich
W. Weidlich,
Mate, C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Approved and forwarded,

Jack Senior
Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

*Sheet examined + approved
J. Senior*

LIST OF STATISTICS
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 3

Launch "Delta"

(1934) DATE	VOL.	DAY	STAT. MILES	POS.	SOUNDINGS HAND-MACH.		MILES TO & FROM WK.	TOTAL DIST. RUN
August 9	1	a	8.4	85	187	100	3.0	10.3
" 14	1	b	11.6	136	405	105	13.5	23.6
" 16	1	c	16.6	147	483	172	5.1	19.5
" 17	2	d	16.6	168	532	170	0.7	15.1
" 18	2	e	12.6	145	684	18	6.5	17.5
" 20	2&3	f	15.5	148	660	85	1.2	13.2
" 21	3	g	19.9	139	313	231	1.4	18.7
" 22	3	h	10.7	143	293	104	7.6	16.9
" 23	4	j	12.9	112	398	100	9.0	20.2
" 27	4	k	13.8	150	490	124	7.1	19.1
" 28	4&5	l	7.7	93	463	19	5.5	12.2
" 31	5	m	8.8	76	360	44	12.5	20.2
Total - August:			155.1	1542	5248	1272	73.1	206.5
September 4	5	n	6.8	63	330	10	6.5	12.3
" 21	5	p	8.3	82	---	82	6.5	13.7
" 22	5	q	13.0	106	---	106	16.0	27.3
Total - September:			28.1	251	330	198	29.0	53.3
October 1	5	r	9.6	126	---	126	15.0	23.3
December 4	6	s	8.0	64	161	114	0.4	7.4
" 5	6	t	9.1	62	124	120	0.3	8.2
" 13	6	u	6.0	55	248	---	0.7	5.9
Total - December:			23.1	181	533	234	1.4	21.5
(1935)								
February 20	6	v	1.7	29	68	18	2.0	4.5
Grand Total - Sheet #3:			217.6	2129	6179	1848	120.5	309.1

TIDE NOTE FOR HYDROGRAPHIC SHEET

May 20, 1935

Division of Hydrography and Topography:

✓ Division of Charts: Attention Mr. E. P. Ellis

Tide Reducers are approved in
6 volumes of sounding records for

HYDROGRAPHIC SHEET 5724

Locality West Point and Vicinity, and Skiff Point and Vicinity, Wash.

Chief of Party: Jack Senior in 1934
Plane of reference is mean lower low water reading
7.6 ft. on tide staff at Seattle
22.1 ft. below B.M. 7

Height of mean higher high water above plane of reference is 11.3 feet.

Condition of records satisfactory except as noted below:

Carl P. Whitney
Chief, Division of Tides and Currents.

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. ..5724

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

Number of positions on sheet	2129.
Number of positions checked	..348
Number of positions revised	...6..
Number of soundings recorded	8027
Number of soundings revised	...17.
Number of signals erroneously plotted or transferred	....0.

Date: May 27, 1935

Verification by L. B. BERES

Inked by

Review by J. G. Ladd

add'l. Verification by, " "

Time: 21 hrs.

" hrs

Time: 14 1/2 "

" 9 1/2 "

HYDROGRAPHIC SURVEY 5724

Smooth Sheet 1

Boat Sheet 1

Sounding Records 6 Vols.

Descriptive Report Yes

Title Sheet Yes

List of Signals Filed in Vol 1

Landmarks for Charts (Form 557) None yes

Statistics Filed in D.R.

Approval by the Chief of Party Yes

Recoverable Stations (Form 524) None Cards

Special Chart for the U. S. Lighthouse Service None Rec'd April 23, '35
(Circular Nov. 30, 1933)

VERIFIER'S REPORT H-5724

The records conform to the General Instructions. ✓
The usual depth curves can be completely drawn. ✓
The field plotting was complete as prescribed in the Hydrographic Manual. ✓
The drafting was complete and satisfactory. ✓
Junctions with adjacent sheets not determined. ✓

Remarks:

The following positions were replotted:

Position 19g-replotted

Position 1g mooring buoy- replotted, position as plotted on smooth sheet agreed with T-6261 but did not agree with records or with boat sheet. Positions as inked
on smooth sheet
accepted as correct
J.G.L.

Position 86h replotted- left angle was incorrectly plotted. ✓

Position 93l (L) - left angle should be Eng-Point - checks boat sheet and is on line. Replotted. ✓

Position 1m replotted both boat sheet and smooth sheet were erroneously plotted. ✓

Position 54u was replotted. ✓

Respectfully submitted

L. B. Beres

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5724 (1934-5) - FIELD NO. 3

West Point and Vicinity and Skiff Point and Vicinity,
Puget Sound, Washington

Surveyed in August - December, 1934, February, 1935

Instructions dated March 29, 1934

Hand Lead and Machine Soundings.

3 Point Fixes on Shore Signals.

Chief of Party - Jack Senior.

Surveyed by - W. Weidlich.

Protracted by - W. Weidlich.

Soundings penciled by - J. F. Ward.

Verified and inked by - L. B. Beres.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except that the special chart showing the location of aids to navigation for use of the U. S. Lighthouse Bureau was not submitted.

2. Compliance with Instructions for the Project.

The survey satisfies the instructions for the project except that the 38 foot spot near the entrance to Lake Washington Ship Canal at lat. 47° 40.65', long. 122° 25.0' should have been further developed.

37' least depth
found in vicinity.
See note, part
10, this review.
H.W.M. 1/26/37

3. Shoreline and Signals.

The shoreline and topographic signals originate with T-6261 (1934) and T-6330 (1934-5).

4. Sounding Line Crossings.

No regular system of crosslines was run. However those that do occur in the normal development of the work together with the parallel adjacent lines are in good agreement.

5. Depth Curves.

Within the limits of the survey the usual depth curves may be satisfactorily drawn including most of the low water curve.

6. Junctions with Contemporary Surveys.

Satisfactory junctions are made with H-5710 (1934) and with H-5709 (1934). The junction with H-5711 (1934-5) on the south will be considered in the review of that survey.

7. Comparison with Prior Surveys.

a. T-1064 (1867).

This topographic survey (on scale of 1:10000) which also contains hydrography overlaps the present survey in the vicinity of Shilshole Bay. The agreement is very satisfactory with the exception of the area at the entrance to "Lake Washington Ship Channel" which was dredged subsequent to the above old survey. A discussion of the changes noted in this area is omitted since it would serve no useful cartographic purpose.

b. H-1102 (1868) H-1337b (1875)
H-1337a (1875) H-1338a (1875)

These surveys (on a 1:10000 scale, except the latter, which is a 1:40000) together cover the entire area of the present survey and are in good agreement with the latter.

c. H-3998 (1917).

This survey (on a 1:5,000 scale) is in satisfactory agreement with the present survey with the exception of the channel and the surrounding area, leading to "Lake Washington Ship Canal." This channel has been dredged deeper and wider since the date of the above survey, consequently a discussion of the changes noted is omitted since it would serve no useful cartographic purpose.

8. Comparison with Charts No. 6447 (Corrected to April 24, 1934), No. 6443 (Corrected to August 6, 1932), No. 6444 (Corrected to March 1, 1935), and No. 6449 (Corrected to June 20, 1935).

a. Hydrography.

Within the limits of the survey the charts are based on surveys discussed in the foregoing paragraphs together with surveys by the U. S. Engineers of the channel and surrounding area of the entrance to Lake Washington Ship Canal. The latest of these blueprints is No. 27036 (1932) which is in satisfactory agreement with the present survey. The charts contain no other information that needs consideration in this review, except the following:

- (1) The small black spot shown on Chart No. 6444 at lat. 47° 38.13', long. 122° 29.46' was found to be an ink spot inadvertently shown on the chart during recent printing. It should be omitted in future charting.

b. Aids to Navigation.

The aids to navigation are charted in substantially the same positions as shown on the present survey, with the following exceptions:

- (1) Buoys S5 and S7 at lat. 47° 40.46', long. 122° 24.51' and lat. 47° 40.32', long. 122° 24.36', respectively, are about 25 meters west of their charted positions.
- (2) The bell buoy at lat. 47° 40.9, long. 122° 25.01' is about 100 meter southeast of its charted position. The position as located, nevertheless, adequately marks the entrance to the canal.

c. Controlling Depths in Channels.

The charted controlling depth in the channel leading into Lake Washington Ship Canal is 33 feet as of June, 1934. The present survey shows least depths of 32 feet in mid channel at lat. 47° 40.37', long. 122° 24.45', lat. 47° 40.51', long. 122° 24.60' and lat. 47° 40.56', long. 122° 24.64'. However each of these soundings is surrounded by deeper water.

9. Field Plotting.

The field plotting was satisfactory.

10. Additional Field Work Recommended.

The survey is complete and satisfactory except that the 38 foot spot off the entrance to Lake Washington Ship Canal at lat. 47° 40.65', long. 122° 25.0' should be further developed.

37' least depth found in vicinity. For discussion see Rev. (par. B-2) of Add'l Work (1936) attached to D.R. of H-5710. H.W.M. 1/26/37

11. Superseding Old Surveys.

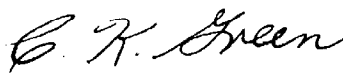
Within its limits the present survey supersedes the following surveys for charting purposes:

T-1064 (1867) in part.	H-1337b (1875) in part.
H-1102 (1868) " "	H-1338a (1875) " "
H-1337a (1875) " "	H-3998 (1917) " "

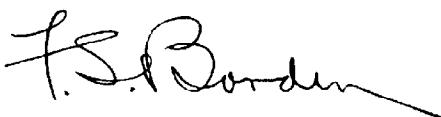
12. Reviewed by - John G. Ladd, September 3, 1935.


Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, 
Chief, Section of Field Records.


Chief, Division of Charts.


Chief, Section of Field Work.


Chief, Division of H. & T.

Applied to Cht. 6444 Oct. 3, 1936 K.R. (Including Additional) 2-17, 1936
" " " 6443 Mar. 1, 1937 K.R. (Work of 1936) 2-19
" " " 6450 Apr. 20, 1937 K.R. "
" " " 6437 Aug. 1942 G.R.

Applied to chart 6446 March 5, 1946 Lam.
Now Cht 6442 - Applied 8/28/64 H.R.G.

5725

(And Addl. Wk. 1936,
For Which SEE 5710,
Addl. Wk. 1936 D.R.)

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 19 1935

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. PATTON, Director

State: WASHINGTON

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 8 5725
Hydrographic }

LOCALITY
Restoration Point
~~BLAKELY ROCK LIGHT~~

TO

~~PULLY POINT LIGHT~~

PUGET SOUND

19 34

CHIEF OF PARTY
JACK SENIOR

5725

(And Addl. Wk. 1936,
For Which SEE 5710,
Addl. Wk. 1936 D.R.)

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

APR 19 1935

REG. NO.

Acc. No. _____

HYDROGRAPHIC TITLE SHEET

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. 8

REGISTER NO. **5725**

State Washington

General locality Puget Sound

Locality Restoration Point
~~Blakely Beck Light to Pully Point Light~~

Scale 1:20,000 Date of survey Sept. 7 to Nov. 16 1934.

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich - Jack Senior

Protracted by F. S. Butler - W. Weidlich

Soundings penciled by F. S. Butler

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by a. m. Uzelovich

Verified by " " "

Instructions dated March 29, 19 34.

Remarks: _____

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 8
BLAKELY ROCK LIGHT TO FULLY POINT LIGHT
PUGET SOUND - WASHINGTON

- 0 -

JACK SENIOR, CHIEF OF PARTY

SEASON OF 1934

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 8

BLAKELY ROCK LIGHT TO PULLY POINT LIGHT

PUGET SOUND - WASHINGTON

AUTHORITY:

The hydrography on this sheet was executed under instructions of the Director, U. S. Coast and Geodetic Survey, dated March 29, 1934.

SCALE:

The scale is 1:20,000 and the soundings are in feet.

LIMITS:

This survey covers the whole navigable area from Latitude 47° 27.0' N. to 47° 36.0' N., connects and overlaps at the north limits with Sheet No. 1 (1:20,000) and Sheet No. 10 (1:5,000) and to the westward with Sheet No. 4 (1:10,000). ✓

METHODS:

The approved methods of the service were used throughout. ✓

The survey between the inshore hydrography was done by the Steamer EXPLORER and is indicated by red capital letters. ✓

The soundings were taken with a steam sounding machine, stranded wire, forty pound lead. All soundings are up and down casts. ✓

The lines are spaced about four hundred meters apart with splits between, wherever required. All lines run in a northerly and southerly direction. ✓

The launch "Delta" was used for all inshore hydrography and is indicated by red lower case letters. ✓

The lines are spaced about 200 meters apart with splits between and run normal to the shore, except in the vicinity of Dolphin Point where the lines are radiating and then run north and south. ✓

A ten pound hand lead was used in depths of less than 15 fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire. All soundings are up and down. ✓

CONTROL:

Triangulation and topography in advance furnished the necessary control.

TIDES:

All reducers for all work were taken from the records of the standard tide gauge maintained by the Seattle Field Station at the foot of Madison Street, Seattle, Washington. ✓

KELP:

The shores in this locality are fringed with more or less kelp during the summer months. A considerable amount of kelp was found between Dolphin Point and Vashon Point. ✓

RESULTS AND COMPARISON:

This survey reduced the depths of several shoals north of Vashon Island and the most notable is the reduction from 39 feet to 26 feet at the north entrance to Colvos Passage. ✓

A comparison of the north area with Chart No. 6444 (1:20,000) shows that depths were reduced considerable in some instances. On account of the scarcity of soundings on Chart No. 6460 a fair comparison can not be made. ✓

CHARACTERISTICS OF THE BOTTOM:

The bottom is very irregular north of Vashon Island and in some instances, soundings obtained by the EXPLORER do not check any too well with those taken by the launch "Delta". ✓

Some doubt exists regarding positions 39 and 40 "f". The weather was extremely hazy and the right object was scarcely visible. Fresh south-east winds and a strong flood caused heavy tiderips, compelling the party to discontinue operations in that locality. *Plotted as recorded. J.G.H.*

The bottom is muddy in deeper water, rocky and sandy near the shores. ✓

DANGERS AND OBSTRUCTIONS:

West Shore

No. 1

A sounding of 148 feet at M.L.L.W. was obtained by the EXPLORER, about 1470 meters, $93\frac{1}{2}^{\circ}$ from triangulation station EAST BLAKE, position 6 "B". Additional soundings taken by the launch "Delta" show much greater depths, on "f" and "n" days. Muddy bottom.

See review of H-5725 (1924) par. 1, b. and pa. 10. JGL.

No. 2

A sounding of 215 feet at M.L.L.W. lies 1630 meters, $108\frac{1}{2}^{\circ}$ from triangulation station EAST BLAKE. Some doubt exists regarding the exact position of this sounding. The weather was unfavorable, strong south-east winds; rough sea, heavy tiderips and very hazy.

accepted as recorded. JGL.

The right object, signal COM, was not clearly visible on account of the extreme hazy and smoky atmosphere when positions 39 and 40 were taken. Visibility improved considerable when nearing the signal and from position No. 41 on, all signals were distinct.

No. 3

A shoal with a least depth found of 54 feet at M.L.L.W., lies about 1950 meters, 19° from triangulation station VASHON. Bottom is muddy. Position 79 "p". Chart No. 6444 shows much deeper soundings in this locality.

No. 4

A shoal with a least depth found of 52 feet at M.L.L.W., lies about 1460 meters, 20° from triangulation station VASHON. Position 61 "p". Rocky bottom. This position plots on Allen Bank.

No. 5

A shoal with a least depth found of 26 feet at M.L.L.W., lies about 570 meters, 8° from triangulation station VASHON. Positions 47 and 48 "p". Additional development on "q" day shows depths of 27 and 28 feet in the immediate vicinity. Bottom is sandy and marked by kelp during summer months.

Chart No. 6460 shows a depth of 6-3/4 fathoms.

No. 6

A shoal area extends for about 200 meters in a north-easterly direction from Dolphin Point and drops off suddenly into much deeper water. The gravel beach south of the point is deep and may be approached close to. ✓

No. 7

At Beals Point the gravel beach extends only a very short distance and drops off suddenly into very deep water. ✓

East Shore

The east shore is free of out-lying dangers and may be approached close to at Williams, Brace and Pully Points. ✓

The gravel spit at Pully Point, locally known as Three Tree Point, extends for about 100 meters and then drops off into much deeper water. ✓

CURRENTS:

No current stations were occupied in this area. The flood runs with the channel in a southerly direction and the ebb in a northerly direction. ✓

The current is strongest at the north entrance to Colvos Passage, with an estimated velocity of from 1 to 3 knots. ✓

WEATHER:

Squally weather, south-easterly winds and strong gales, delayed the work considerable while in progress. ✓

Respectfully submitted,

W. Weidlich

W. Weidlich,
Mate, C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Approved and forwarded,

Jack Senior

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

Sheet examined & approved.
J. Senior

LIST OF STATISTICS
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 8

Launch "Delta"

(1934) DATE	VOL.	DAY	STAT. MILES	POS.	SOUNDINGS HAND-MACH.		MILES TO & FROM WK.	TOTAL DIST. RUN
October 10	1	a	8.9	81	158	120	11.5	19.2
" 11	1	b	9.9	94	175	107	11.0	21.6
" 16	1	c	11.7	107	302	125	12.0	22.2
" 17	1&2	d	16.9	134	170	192	8.0	22.8
" 18	2	e	17.9	105	201	216	10.5	26.1
" 19	2	f	13.0	75	110	158	13.0	24.0
" 20	2	g	15.8	97	123	183	3.4	17.2
" 21	2	h	5.4	31	39	51	1.0	5.7
" 26	3	j	8.4	91	252	86	1.0	8.3
" 27	3	k	15.4	137	198	168	7.8	21.2
" 28	3	l	5.6	49	47	78	1.5	6.5
" 29	3	m	16.0	132	236	182	1.5	15.4
" 30	4	n	17.8	151	201	209	3.7	19.2
" 31	4	p	6.7	89	253	33	2.3	8.3
Total - October			169.4	1373	2465	1908	88.2	237.7
NOVEMBER 16	4	q	2.0	41	19	22	--	3.6
Grand Total - "Delta":			171.4	1414	2484	1930	88.2	241.3

U.S.C. & G.S.S. EXPLORER

(1934)								MISC. RUN	
September 7	5	A	20.6	60	---	60	7.0	---	24.9
" 8	5	B	31.5	101	---	101	7.0	1.0	35.4
" 10	5	C	26.5	98	---	98	6.0	5.5	34.6
" 11	5	D	26.0	100	---	100	13.0	---	35.6
" 12	5	E	16.3	64	---	64	11.0	3.0	28.2
" 21	5	F	----	68	---	68	9.0	20.0	29.0
Total - September:			120.9	491	---	491	53.0	29.5	187.7
Grand Total - Sheet #8:			292.3	1905	2484	2421	141.2	29.5	429.0

22c

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Ed. Feb. 1935

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

June 6, 1935.

✓ Division of Charts: Attention Mr. E. P. Ellis

Tide Reducers are approved in
5 volumes of sounding records for

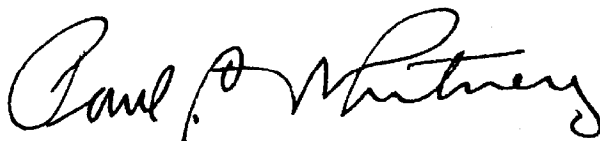
HYDROGRAPHIC SHEET 5725

Locality Restoration Point to Pully Point, Puget Sound, Washington.

Chief of Party: Jack Senior in 1934
Plane of reference is mean lower low water reading
7.6 ft. on tide staff at Seattle
22.1 ft. below B.M. 7

Height of mean high water above plane of reference is 10.5 feet .

Condition of records satisfactory except as noted below:


Chief, Division of Tides and Currents.

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. 5725

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

Number of positions on sheet	...1905
Number of positions checked	....17.
Number of positions revised	....7.
Number of soundings recorded,	..4995
Number of soundings revised	.....2
Number of signals erroneously plotted or transferred	.....

Date: July 25, 1935

Verification by A.M. Uzefovich

Time: 120 hours

Review by

John G. Ladd

Time: 10 hrs.

add'l. verification

" " "

" 2 1/2 "

HYDROGRAPHIC SURVEY 5725

Smooth Sheet-----1-----

Boat Sheet-----1-----

Sounding Records-----5-----Vols.-----

Descriptive Report-----Yes-----

Title Sheet-----Yes-----

List of Signals-----Filed in Vol 1-----

Landmarks for Charts (Form 567)-----None Rec'd April 23, '35-----

Statistics-----Filed in D. R.-----

Approval by the Chief of Party-----Yes-----e

Recoverable Stations (Form 524)-----None-----Cards

Special Chart for the U. S. Lighthouse Service-----None Rec'd April 23, '35
(Circular Nov. 30, 1933)

July 25, 1935

Section of Field Records
Report on H-5725 (1935)

1. The records conform to the requirements of the General Instructions. ✓
2. The field plotting was completed to the extent prescribed in the General Instructions. ✓
3. The hydrography is complete and the usual depth curves can be drawn. ✓
The delineation of the depth curves by the field plotter was good. ✓
4. The office cartographer retouched the MLLW line from T.6266(1934). ✓
5. The junction with adjacent sheet H-5709(1934-35) was verified and ✓
found satisfactory.
The junction with adjacent sheet H-57II(1934-35) was not verified ✓
as this sheet is not inked yet.
The junction with adjacent sheet south of H-5725 was not made as ✓
this sheet is not received in the office.
6. Remarks: A visual inspection of the course lines and location of ✓
the positions on the smooth sheet, in comparison with the boat sheet,
was performed. Both sheets agree satisfactorily.

Volume 2, page 18, position 62 e (Lat. 47 30.6, Long. 122 28) :

"snag abeam port" it is not shown on the smooth and boat sheets. ✓

Pilings at FAUNTLEROY COVE and north of VASHON ISLAND were shown
on the smooth sheet according to the T.6266(1934).

Respectfully submitted

Alexis M. Uzefovich

Alexis M. Uzefovich

Jr. Carto. Eng. U.S.C. & G.S.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5725 (1934) - FIELD NO. 8

Restoration Point to Pully Point, Puget Sound, Washington
Surveyed in September - November, 1934
Instructions dated March 29, 1934

Hand Lead and Machine Soundings.

3 Point Fixes on Shore Signals.

Chief of Party - Jack Senior.
Surveyed by - Jack Senior, W. Weidlich.
Protracted by - W. Weidlich, F. S. Bulter.
Soundings penciled by - F. S. Bulter.
Verified and Inked by - A. M. Uzefovich.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. All the topographic detail had not been transferred to the hydrographic sheet. This has been accomplished in the office.
- b. While the "Descriptive Report" is complete and adequately covers most of the important items, a recommendation should have been included regarding the disposition of the 148 foot sounding discussed under "Dangers and Obstructions" par. 1, page 3 of the Descriptive Report. This 148 foot sounding is a detached position ("EB") of the "Explorer," but was later investigated by the launch "Delta" and a least depth of 274 feet obtained. However, it is considered that the error was not one of depth but of position and that the 148 was probably obtained on the shoal about 160 meters to the northwestward. Therefore the 148 foot sounding has been replotted on the locus of the right angle in the most logical position on the shoal in the area.

148' sdg disproved.
See note, par. 10,
this review.

2. Compliance with Instructions for the Project.

This is a well executed survey and satisfies the instructions for the project.

3. Shoreline and Signals.

The shoreline and topographic signals originate with T-6262 (1934), T-6266 (1934), T-6267 (1934) and T-6332 (1934).

4. Sounding Line Crossings.

No regular system of cross lines was run. However, those that do occur in the normal development of the work, together with the parallel adjacent lines are in good agreement.

5. Depth Curves.

Within the limits of the survey the usual depth curves may be satisfactorily drawn including nearly ^{all} of the low water curve.

6. Junctions with Contemporary Surveys.

A satisfactory junction is made with H-5709 (1934-5) on the north. The junctions with H-5844 (1934-5) on the northeast, with H-5711 (1934-5) on the west and with Field Sheet No. 3 (1935) on the south (not yet received in the office) will be considered in the reviews of those surveys.

7. Comparison with Prior Surveys.

a. H-1338a (1875) and H-1425a (1877-8).

These two surveys make a very good agreement with the present survey with the following exceptions:

- (1) The 6 and 7 foot soundings shown on H-1425a (1877-8) and charted as $1\frac{1}{2}$ and $1\text{-}3/4$ fathoms (a correction of 3.7 feet having been added to all soundings on the old survey to bring them to the plane of M. L. L. W.) at lat. $47^{\circ} 29.45'$, long. $122^{\circ} 27.32'$ and lat. $47^{\circ} 28.82'$, long. $122^{\circ} 26.78'$, respectively, fall in depths of 68 and 27 feet, respectively, on the present survey. Both soundings are single soundings at the beginning of lines running out from shore and are not corroborated by the surrounding depths. Subsequent soundings on the lines also fall in deeper water on the present survey, and it is quite evident that the lines are out of position. Although the positions (29y and 14v) are plotted as recorded, it is noted that by using the tangent to Pully Point instead of signal "Pully" for the right object, the soundings fall in comparable depths on the present survey. The 6 and 7 foot soundings should be disregarded in future charting.
- (2) The 5 foot sounding shown on H-1425a (1877-8) (charted as $1\text{-}1/4$ fathom, with the 3.7 feet correction applied) at lat. $47^{\circ} 30.40'$, long. $122^{\circ} 27.08'$ falls on the present survey in depths of 32 feet. The 5 (pos. 72e') was found to be incorrectly plotted and when corrected falls in comparable depths on the present survey.

b. H-3764 (1915) W. D.

This survey contains no effective drag depths that are in conflict with the present survey.

8. Comparison with Chart No. 6444 (Corrected to March 1, 1935), 6449 (Corrected to June 20, 1935) and 6460 (Corrected to June 8, 1934).

a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs and contains no additional information that needs consideration in this review.

b. Aids to Navigation.

The charted light on Pully Point is the only aid to navigation within the limits of the present survey, and agrees substantially with the position of \triangle Station Pulley (1921). However in this connection it should be stated that the (1934) recovery notes for \triangle Station Pulley (1921) states that the permanent light, which was but 11 meters away from the \triangle station, has been undermined and that a temporary light on a tripod has been located over the \triangle station.

9. Field Plotting.

The field plotting was very satisfactory.

10. Additional Field Work Recommended.

The shoal on the northern end of Allen Bank with the least depth of 148 feet at lat. 47° 32.49', long. 122° 27.68' (see par. 1b this review) should be further developed. Because of its importance in entering Colvas Passage the entire area of Allen Bank from the 5 to the 50 fathom curve should be wire dragged when feasible.

148' sdg. disproved.
Allen Bank dragged.
For discussion
see Rev. (ppn 37419)
of Ad. Wk. (1936)
attached to D.R.
of H-5710.
H.W.M. 2/4/37

11. Superseding Old Surveys.

Within the area covered, the present survey supersedes the following surveys for charting purposes:

- H-1338a (1875) in part.
- H-1425a (1877-8) " "

12. Reviewed by - John G. Ladd, September 30, 1935.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

L. C. ...
Chief, Division of Charts.

H. S. Borden
Chief, Section of Field Work.

G. ...
Chief, Division of H. & T.

△ EAST BLAKE

TA ○

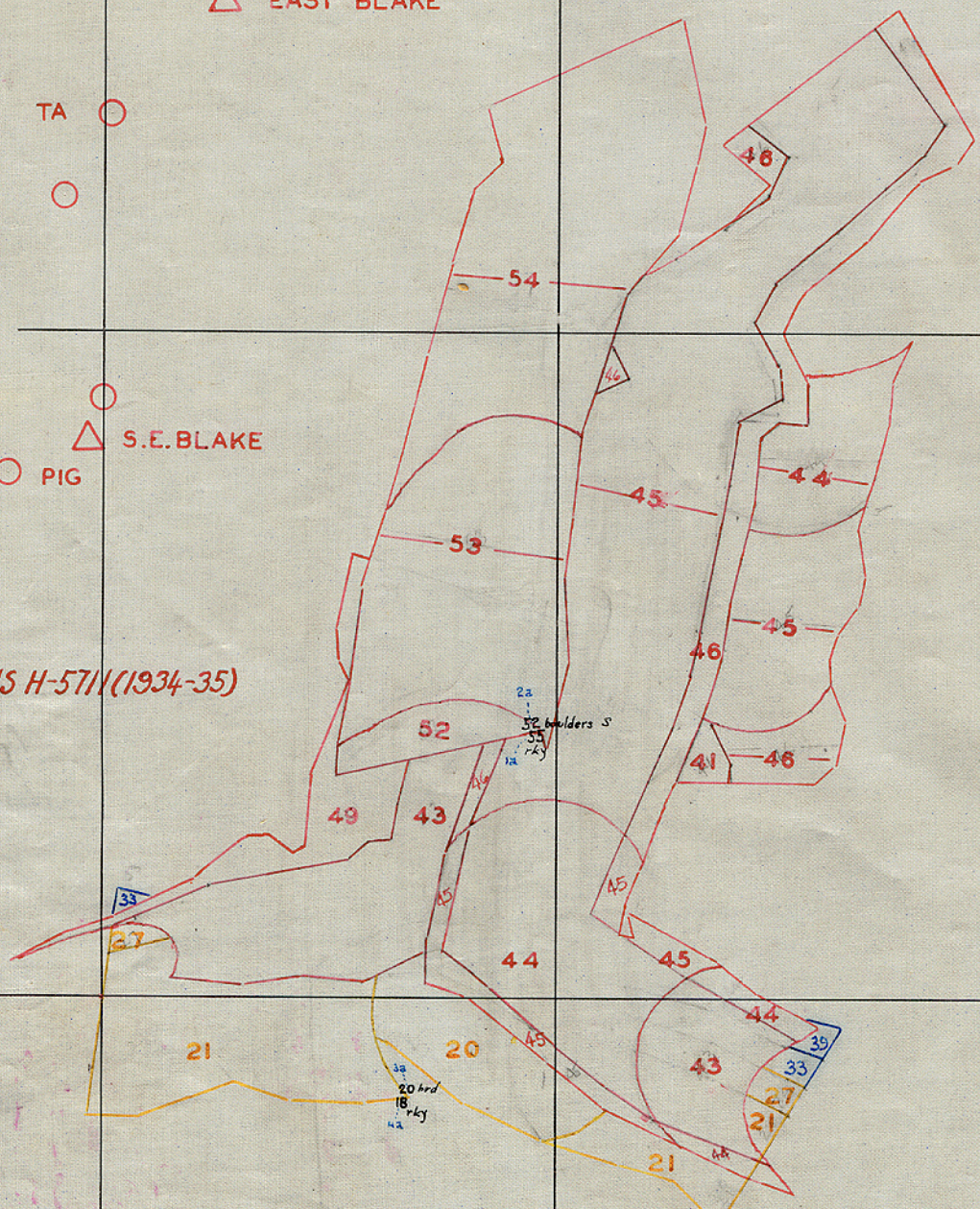
○

○

△ S.E. BLAKE

○ PIG

JOINS H-5711 (1934-35)



△ SOUTHWORTH

JOINS H-5930 (1935)

△ VASHON

○ HOW

△ DOLPHIN

Section of Boat Sheet, H-5725
Ad. Work (1936) by G.C. Jones
Scale 1:20,000

Drag Work recorded in volumes 8 and 9, H-5710.
For discussion, see Rev. (par. B-10) of Ad. Wk. at-
tached to Descriptive Report of H-5710.

29'

122° 28'

27'

32'

31'

47° 30'

(Including additional work of 1936)
Applied to Cht. 6449 Apr. 29, 1936

C.H.D. & K.R.

Applied to Cht. 6444 Oct. 31, 1936 K.R.

(Including additional work of 1936)

Applied to Cht. 6450 Apr. 20, 1937 K.R.

" " 6460 Apr. 19, 1938 K.R.

25 Jan 17, 1936
C.H.D.

Applied to chart 6446 Feb. 12, 1946. L.A.M.

New Chart 6442 - Applied 9/24/64 GRJ

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5710

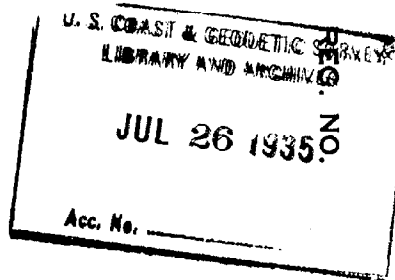
DEN
10 16 98

584458455846
5710

Form 504	
U. S. COAST AND GEODETIC SURVEY	
DEPARTMENT OF COMMERCE	
DESCRIPTIVE REPORT	
Type of Survey	<i>Hydrographic</i>
Field No.	Office No. <i>5844-46</i>
LOCALITY	
State	<i>Washington</i>
General locality	<i>Ellick Bay</i>
Locality	
<u>1984-35</u>	
CHIEF OF PARTY	
<i>Jack Senior</i>	
LIBRARY & ARCHIVES	
DATE	

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET



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. 1.

REGISTER NO. **5844**

State Washington

General locality Puget Sound

Locality Alki Point to West Waterway

Scale 1:5,000 Date of survey Nov. 6, '34-Apr. 11, 1935

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by E. S. Butler & W. Weidlich

Soundings penciled by F. S. Butler

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by E. S. Butler

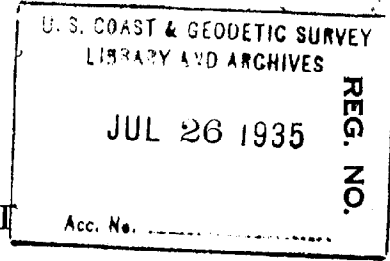
Verified by H. F. Garber

Instructions dated March 29, _____, 19 34.

Remarks: _____

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET



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. 1a

REGISTER NO. **5845**

State Washington

General locality Puget Sound - Elliott Bay ¹⁰

Locality Duwamish Waterways ¹⁷

Scale 1:5,000 Date of survey May 20 - May 24, 1935.

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by F. S. Butler

Soundings penciled by F. S. Butler

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by ~~H.H. Hardy~~ C.R. Draper

Verified by ~~F. S. Butler~~ " "

Instructions dated March 29, 1934.

Remarks: _____

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

JUL 26 1935

REG. NO.

HYDROGRAPHIC TITLE SHEET Acc. No. _____

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. 2

REGISTER NO. **5846**

State Washington

General locality ~~Puget Sound~~ - Elliott Bay

Locality Smith Cove to East Waterway²⁻⁴

Scale 1:5,000 Date of survey Feb. 28 to May 23, 1935.

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by F. S. Butler

Soundings penciled by F. S. Butler

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by ~~H. H. Hardy~~ H. W. Murray

Verified by ~~F. S. Butler~~ H. W. M.

Instructions dated March 29., 19 34.

Remarks: _____

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEETS NOS. 1, 1a, and 2,

ELLIOTT BAY, PUGET SOUND,

WASHINGTON.

- o -

JACK SENIOR - CHIEF OF PARTY

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEETS NOS. 1, 1a, and 2, ^{H-5845} ✓
^{H-5846} ✓

ELLIOTT BAY, PUGET SOUND

WASHINGTON.

AUTHORITY:

The hydrography on this sheet was executed under Instructions of the Director of the U. S. Coast and Geodetic Survey, dated March 29th, 1934. ✓

SCALE:

The scale is 1:5,000, and the soundings are in feet. ✓

LIMITS:

This survey covers the entire area of Elliott Bay and also extends about one and one half miles south of Alki Point. ✓

Sheet No. 1 begins south of Alki Point and at its southern limits connects with and overlaps Hydrographic Sheet No. 8 (Scale 1:20,000, 1934), at the west and north limits with sheet No. 1 (Scale 1:20,000, 1934), and at the east limits with sheets Nos. 1a, and 2, (Scale 1:5,000).

Sheet No. 2, connects with and overlaps at its western limits with sheet No. 3 (Scale 1:10,000, 1934), and with sheet No. 1 (Scale 1:20,000, 1934) and with sheet No. 1, 1935. ✓

Sheet No. 1a, connects with and overlaps sheets Nos. 1 and 2 (1935) and extends as far as the Spokane Street Bridge. ✓

METHODS:

The approved methods of the service were used throughout. The launch "Delta" was used for all the work and the letter days are shown in red. A ten pound hand lead was used in depths of less than fifteen fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire. All soundings are up and down. All sounding lines were run on ranges which will explain the lack of compass headings in the sounding volumes. ✓

On Sheet No. 1 the sounding lines run east and west at the south limit of the sheet, radiating around Alki Point to a north and south direction. The sounding lines are spaced one hundred meters apart with splits between. Near the wharves the lines were spaced much closer. ✓

On sheet No. 2 practically all lines run in a north and south direction except between and near the wharves. The sounding lines are spaced one hundred meters apart with splits between. Between the wharves the lines are run much closer. ✓

On sheet No. 1a, the lines run with the channel and are spaced from 25 to 30 meters apart and in some instances much closer. ✓

On days when strong northerly or southerly winds did not permit launch hydrography soundings were taken from the wharves. As a rule the soundings are spaced 15 meters apart unless otherwise stated. Positions were given at signals located at that time or at some prominent object, such as life ring boxes, derricks, ends of buildings, etc. ✓

Although the low water line is well determined along the beaches it was not possible to do so in the inner harbor for the following reasons: ✓

Strong winds with falling tides did not permit an approach to the shores without undue risk to the sounding launch especially near the tideflats where the shore is littered with old piling, small boats anchored and then secured with lines to the shore, numerous log rafts, barges, equipment of the Puget Sound Dredging Company which occupies the whole area in the West Water Way between signals "ELK" and "LOW". ✓

During the winter months the Alaska Steamship Company ties up practically their whole fleet of sixteen or more vessels to the moorings located at the east shores of West Seattle, south of station "MOEN 1934". The regular sounding lines end within a meter or so of the fleet. The fixes are weak as the signals are shut out by the numerous masts and smoke stacks, and in most cases the lines end on range with one angle only. Soundings were taken alongside the wharf where it was possible to obtain fixes. Fixes were also taken in order to locate the new extension of the wharf which had been rebuilt during the winter months after the topography had been completed. ✓

In the West Waterway the low water line was not determined near the west entrance on account of falling or minus tides, broken off piling, and numerous small boats anchored near the shore. Grounding of the launch at this time would have meant serious damage to the hull and possible capsizing of the launch, on account of the heavy swells created by passing fast and large ferry boats. ✓

In view of the fact that fixes were not available no attempt was made to take any soundings alongside the various steamers. ✓

CONTROL:

Triangulation and topography furnished the necessary control except on sheet No. 1a, between Handford and Spokane wharves, where a few prominent objects were located by sextant fixes. The fixes are weak but were the only ones available in this locality. ✓

Hydro. Signals.

TIDES:

All tide reducers for these sheets were obtained from the records of the standard tide gauge maintained at Seattle.

KELP:

Small patch on H-5846 but of no importance.
No kelp was found while the survey was in progress, but the shores of Alki Beach and Magnolia Bluff are known to be fringed with more or less kelp during the summer months.

CHARACTERISTICS OF THE BOTTOM:

The bottom is generally muddy and sticky in the deeper water. From Duwamish Head to the south limits of the sheet the bottom is sandy with occasional gravel. The bottom east of Duwamish Head is muddy throughout with occasional sand and rocky bottom near the shores. East of Smith Cove the bottom is alternating, muddy, rocky and sandy. There are numerous snags in this locality and remains of old sawmill wharves. Near the bulkhead extending as far as the Union Oil Docks, the bottom is sandy, but rocky near the bulkheads. Between the wharves in Seattle the bottom generally is muddy but rocky near the bulkheads. Bottom as a rule is uniform except in places mentioned in dangers and obstructions.

DANGERS AND OBSTRUCTIONS:

Elliott Bay is free of dangers and obstructions with the exception of the shoal extending from Duwamish Head and the shoal area northwest of the East Waterway.

1. The bottom northwest of Alki Point Lighthouse is very irregular and extends for about 100 meters from station "ALKI" and then drops off into much deeper water. Bottom in this locality is sandy and no doubt subject to some changes during southeast gales experienced during the last winter months.

2. Bottom is very irregular west of signal "VER". Least depth obtained was 22 feet about 350 meters 262° (True) from signal "VER", positions 28-29 b and 6-7 f. Bottom is sandy.

3. Very irregular bottom exists about 360 meters 265° (True) from station "DUWAMISH". A depth of 20 feet was obtained about 360 meters 263° from station "DUWAMISH", position 26 f. This spot is surrounded by much shoaler water and 15 and 16 foot soundings were obtained immediately north of position. Bottom is sandy.

4. A shoal extends for about 550 meters in a north northwest direction from Duwamish Head. Bottom is sandy and deepens gradually. The extreme end is marked by a gas and bell buoy placed in about 53 feet of water.

6 47-35.5' 122-25.7

5. The low water line northwest of West Waterway is as well defined as tides and safety to the launch would permit. Launch "Delta" grounded on several occasions in this locality.

6. Bottom is very irregular north of West Waterway Light and station "TODD". The fact is well known to the operators of the Todd Dry Docks, Inc., and according to reports was not caused by dredging.

7. Shoal area extends for some distance between Associated Oil Company's dock and the General Petroleum Company's dock, located immediately north of station "KOL" west of the East Waterway. This shoal extends for about 170 meters from the high water line and the area is littered with old piling.

8. A shoal extends for about 220 meters in a northerly direction from station "EAST WATERWAY" at the east entrance to that body of water. A light on an unpainted pile dolphin is established in about 4 feet of water and a spar buoy is maintained about 100 meters north of the light in about 35 feet of water, muddy bottom. The low water line of that shoal was approached as close as tides and safety to the launch would permit.

9. A ledge extends for about 40 meters from a small and narrow pier on which signals "WELL" and "ROSS" are located. This ledge is awash on extreme low tides.

Pos 82V states that ledge extends 15m. during a +2 1/2' tide - plotted

Line 1-2W shows depths of 4-5' extending out 40m.

*Lat 47 15.74
Long 122 00.7*

Regrades

10. A shoal created by the Denny Hill Regrades in 1929 lies west of the municipal piers on which stations "LENORA" and "BELL" are located. Least depth obtained lies about 130 meters 237° (True) from station "LENORA". Depths of 52 and 53 feet were obtained in the immediate vicinity. Numerous soundings were taken and only least depths obtained were recorded. Position 37 u, muddy bottom.

*Lat 47 15.74
Long 122 00.7*

A depth of 45 feet was obtained about 500 meters 276° (True) from station "BELL", positions 12-13 r and 7-8-m. Hard bottom.

44' in this pos. 1/2 m.

Comparing this survey with previous surveys it is evident that the mud was dumped promiscuously. Chart No. 6449 shows depths from 80 to 100 feet in this vicinity.

WEATHER:

Weather was most of the time very unfavorable for field work while the work was in progress at the western portion of sheet No. 1. Field work was discontinued December 19, 1934 and resumed February 28, 1935. Conditions at that time would have been more favorable for sounding on a 1:20,000 scale sheet. On account of high winds it

was impossible to run the launch slow enough to get the proper spacing between positions, These winds also delayed the work considerably but no time was lost as a considerable amount of office work was done when it was impossible to work in the field. ✓

CURRENTS:

No current stations were occupied in this area but it is believed that all necessary data has been obtained from previous current surveys. ✓

Some difficulties were experienced in the vicinity of Alki Point where strong northerly set was encountered, accelerated by strong southerly winds. ✓

Respectfully submitted,

W. Weidlich.
W. Weidlich,
Mate, C. & G. Survey.

APPROVED AND FORWARDED:

Jack Senior
Jack Senior,
Chief of Party, C. & G. Survey,
Comdg., U.S.C. & G.S.S. EXPLORER.

CKA

Tracings for hydro. sheets 142 not forwarded since these were made in the field prior to receipt of Bulletin No. 5 (Apr. 22) & were not saved. All work checked & initialed.

STATISTICS

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 1

DATE (1934)	VOL.	DAY	BOAT	STAT. MILES	POS.	SOUNDINGS HAND-MACH		TO & FROM WORK	TOTAL DIST. RAN
Nov. 6	1	a	Delta	6.2	77	334	44	9.3	14.7
" 7	1	b	"	6.2	60	164	93	3.0	8.4
" 8	1	c	"	10.4	92	143	177	1.5	10.5
" 9	1	d	"	11.6	110	155	210	---	10.1
" 13	2	e	"	10.2	104	106	225	1.1	10.0
" 15	2	f	"	0.2	38	84	---	---	0.3
" 16	2	g	"	8.9	91	120	153	0.4	8.1
" 21	2	h	"	11.5	119	260	191	0.7	10.7
" 23	2	j	"	1.3	12	---	24	0.4	1.5
" 26	3	k	"	8.0	86	19	155	0.4	7.5
" 27	3	l	"	<u>8.4</u>	<u>80</u>	<u>28</u>	<u>177</u>	<u>0.5</u>	<u>7.8</u>
Total for November:				82.9	869	1413	1449	17.3	89.6
Dec. 1	3	m	"	3.4	42	108	72	4.4	7.5
" 17	3	n	"	8.7	100	154	165	2.1	9.7
" 19	3	p	"	<u>2.5</u>	<u>20</u>	<u>---</u>	<u>53</u>	<u>---</u>	<u>2.4</u>
Total for December:				14.6	162	262	290	6.5	19.6
<u>(1935)</u>									
Mar. 20	4	q	"	1.0	8	---	17	4.0	6.0
" 27	4	r	"	<u>12.9</u>	<u>120</u>	<u>62</u>	<u>278</u>	<u>4.0</u>	<u>16.2</u>
Total for March:				13.9	128	62	295	8.0	22.2
Apr. 2	4&5	s	"	10.0	122	76	279	3.5	14.2
" 4	5	t	"	11.1	115	195	240	3.0	14.6
" 5	5	u	"	9.9	158	356	133	5.0	15.6
" 8	6	v	"	1.0	5	104	7	3.0	4.0
" 11	6	w	"	<u>----</u>	<u>16</u>	<u>142</u>	<u>---</u>	<u>---</u>	<u>----</u>
Total for April				32.0	416	873	659	14.5	48.4
Grand Total:				143.4	1575	2610	2693	46.3	179.8
						2693			
						5303			

STATISTICS

H 5845

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 1 a.

DATE	VOL.	DAY	BOAT	STAT. MILES	POS.	SOUNDINGS HAND-MACH	TO & FROM WORK	TOTAL DIST. RAN
(1935)								
May 20	1	a	Delta	3.0	54	186 ---	---	2.6
" 21	1	b	"	7.8	90	486 ---	3.0	10.8
" 22	1	c	"	9.9	124	600 ---	4.0	13.6
" 23	2	d	"	7.7	141	633 ---	3.0	11.7
" 24	2	e	"	<u>1.2</u>	<u>32</u>	<u>110</u> ---	<u>2.5</u>	<u>4.5</u>
Total:				29.6	441	2015 ---	12.5	43.2

STATISTICS

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 2

DATE (1935)	VOL.	DAY	BOAT	STAT. MILES	POS.	SOUNDINGS HAND-MACH		TO & FROM WORK	TOTAL DIST. RAN
Feb. 28	1	a	Delta	5.2	76	296	40	0.5	6.0
Mar. 18	1	b	"	2.5	---	233	---	---	2.2
" 21	1	c	"	13.2	143	355	170	2.0	14.6
" 22	2	d	"	7.1	89	270	98	2.5	9.9
" 23	2	e	"	4.2	55	193	36	3.0	8.6
" 26	2	f	"	9.5	147	515	90	2.8	----
" 26	3	f	"	0.5	6	18	7	1.2	14.7
" 28	3	g	"	<u>1.5</u>	<u>---</u>	<u>128</u>	<u>---</u>	<u>---</u>	<u>1.3</u>
Total for March:				38.5	440	1712	401	11.5	51.3
APRIL 1	3	h	"	2.5	---	165	---	---	2.2
" 3	3	j	"	3.0	---	360	---	---	2.6
" 6	3	k	"	8.2	65	15	166	4.5	12.6
" 7	3&4	l	"	13.2	129	92	315	2.0	14.4
" 9	4	m	"	12.7	141	171	296	2.0	14.1
" 10	4&5	n	"	9.5	162	398	125	3.0	12.3
" 11	5	p	"	0.5	---	21	---	---	0.4
" 16	5	q	"	7.9	108	315	104	3.0	11.9
" 17	5&6	r	"	7.4	177	506	9	2.0	10.4
" 18	6	s	"	8.8	171	546	78	3.0	12.7
" 19	6	t	"	<u>1.0</u>	<u>35</u>	<u>126</u>	<u>---</u>	<u>1.5</u>	<u>3.5</u>
Total for April:				74.7	988	2715	1093	21.0	97.9
May 1	6	u	"	2.0	40	147	---	1.5	5.7
" 2	6	v	"	2.5	95	270	---	---	4.0
" 22	6	w	"	----	4	11	---	---	----
" 23	6	x	"	<u>0.2</u>	<u>6</u>	<u>17</u>	<u>---</u>	<u>---</u>	<u>0.2</u>
Total for May:				4.7	145	445	---	1.5	9.9
Grand Total:				123.1	1649	5168	1534	34.5	164.1
						<u>1534</u>			
						6762			

August 7, 1935.

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

✓ Division of Charts: Attention Mr. E. F. Ellis

Tide Reducers are approved in
6 volumes of sounding records for


HYDROGRAPHIC SHEET 5844

Locality Alki Point to West Waterway, Puget Sound, Washington.

Chief of Party: Jack Senior in 1934 - 1935.
Plane of reference is mean lower low water reading
7.6 ft. on tide staff at Seattle
22.1 ft. below B.M. 7

Height of mean high water above plane of reference is 10.5 feet.

Condition of records satisfactory except as noted below:


Chief, Division of Tides and Currents.

August 6, 1935.

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

✓ Division of Charts: Attention: Mr. E. P. Ellis

Tide Reducers are approved in
2 volumes of sounding records for

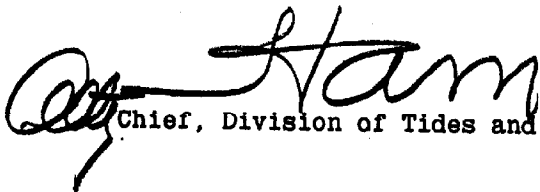
HYDROGRAPHIC SHEET 5845

Locality Duwamish Waterways, Puget Sound, Washington.

Chief of Party: Jack Senior in 1935.
Plane of reference is mean lower low water, reading
7.6 ft. on tide staff at Seattle
22.1 ft. below B.M. 7

Height of mean high water above plane of reference is 10.5 feet.

Condition of records satisfactory except as noted below:


Chief, Division of Tides and Currents.

SAR

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Ed. Feb. 1935

TIDE NOTE FOR HYDROGRAPHIC SHEET

August 7, 1935.

Division of Hydrography and Topography:

✓ Division of Charts: **Attention: Mr. E. P. Ellis**

Tide Reducers are approved in
7 volumes of sounding records for

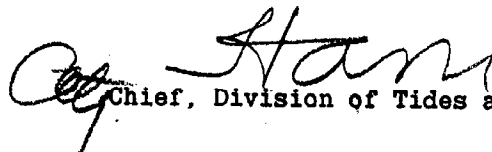
HYDROGRAPHIC SHEET **5846**

Locality **Smith Cove to East Waterway, Puget Sound, Washington.**

Chief of Party: **Jack Senior in 1935**
Plane of reference is **mean lower low water reading**
7.6 ft. on tide staff at Seattle
22.1 ft. below B.M. 7

Height of mean high water above plane of reference is 10.5 feet.

Condition of records satisfactory except as noted below:


Chief, Division of Tides and Currents.

Field Records Section (Charts).

HYDROGRAPHIC SHEET NO.5844

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

Number of positions on sheet	.1575.
Number of positions checked	..46..
Number of positions revised	...11..
Number of soundings recorded	..5303..
Number of soundings revised	...31..
Number of signals erroneously plotted or transferred✓

Date: Mar. 9, 1936

Inked by *W. L. Moore*
Verification ^{and inkings} by *Harold W. Murray*

Review by *R. J. Christman*

Time: 16 hrs. } 46
30 " }

Time: 18 1/2 hrs

Field Records Section (Charts).

HYDROGRAPHIC SHEET NO. **5845**

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

Number of positions on sheet	..441..
Number of positions checked	...34.
Number of positions revised	.....1.
Number of soundings recorded	..2015..
Number of soundings revised	...67.
Number of signals erroneously plotted or transferred	.....0.

Date: *Aug 27 1935*

Verification by *C. R. DRAPER.*

Time: *29 hrs*

Review by *John G. Ladd.*

Time: *17 hrs,*

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO.5846

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

Number of positions on sheet	1649.
Number of positions checked	..35.
Number of positions revised	...11.
Number of soundings recorded	6702.
Number of soundings revised	...70.
Number of signals erroneously plotted or transferred ✓

Date: Feb. 24, 1936

Verification by Harold W. Murray

Time: 6 days

Review by

R. J. Christman

Time: 19½ hrs

HYDROGRAPHIC SURVEY NO. 5844

Smooth Sheet 1

Boat Sheet 1

Sounding Records 6 Vols. _____

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes in Vol. 1

Landmarks for Charts (Form 567) Yes

Statistics Yes

Approved by Chief of Party J. Senior

Recoverable Station Cards (Form 524) Yes

Special Chart for Lighthouse Service None
(Circular Nov. 30, 1933)

Remarks _____

HYDROGRAPHIC SURVEY NO. 5845

Smooth Sheet 1 & Blueprints

Boat Sheet 1

Sounding Records 2 Vols. _____

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes in Vol. 1

Landmarks for Charts (Form 567) Yes

Statistics Yes

Approved by Chief of Party J. Senior

Recoverable Station Cards (Form 524) None

Special Chart for Lighthouse Service None
(Circular Nov. 30, 1933)

Remarks _____

Verification Report on H 5844 (1934-35)

1. Condition of Records

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

a. Position day letters were inked opposite every position, instead of every fifth position and at the end of lines.

b. Position numbers and day letters of g and h days in the southeast portion of the sheet were inked so as to read

c. It is the usual practice to show intermediate parallels and meridians ~~at 26'~~ as seconds of arc such as lat. 36° 30" instead of 36.5' ✓

2. Shorelines & Signals

The shorelines and signals used originate with plans table surveys: T-6331 (1934), T-6332 (1934), T-6334 (1935) and T-6266 (E 1934).

3. Leading Line Crossings

No general system of cross lines was run, but those that ~~result from the work~~ agree with adjacent lines in satisfactory except in a few cases where the bottom has either changed rapidly or the lines are slightly out of position.

4. Depth Curves

The usual depth curves may be satisfactorily drawn over the main portion of the sheet. Half foot markings were fully used in some of the curves.

5. Junctions with Contemporary Surveys

a. The junctions with H-5845 (1935) and H-5846 (1935) on the south & east are satisfactory except that in the vicinity of

Lat. $47^{\circ} 35.4$, long. ~~122°~~ 21.2 , lines 20 & 21 of H-5846
is decidedly shallower than sounding on the present survey. ~~What~~
This area was carefully checked and changes made in some angles to
improve agreement with time & course. ^{Differences are probably due to} steep slopes in this vicinity ~~of~~

b. The junctions with H-5709 (1934-35) and H-5725
(1934) are satisfactory although sounding of other sheets are
few in number due to the difference in scales. The enlargement
of 4 times was made with proportional dividers. ✓

6. Field Plotting

Field plotting & plotting of soundings were ^{exceptionally} ~~very~~ accurate
and conform to the requirements of the hydrographic manual ✓

7. Remarks.

a. The compass attention should be directed to the improved
and enlarged dock in lat. $47^{\circ} 35.35$, long. $122^{\circ} 22.65$
which was located by hydrographic fixes and is not shown
on T-6331 (1934). ✓

b. The buoy (pos 96t) in lat. $47^{\circ} 35.4$, long. $122^{\circ} 22.2$
is unusual in that it is in 235 feet of water. ^{this is of mooring buoy.}

c. The major portion of this sheet was written by Mr. W. L. Moore. ✓

Verified & inked in part by Harold W. Murray ✓

Mar. 9, 1936

~~Home~~
~~The D.R. (combined-3 sheets) is not available~~

P.S. The D.R. (combined-3 sheets) is not available for final checking
if it is affecting this sheet. ✓

Report on H-5845 (1935)

1. The field plots penciled all depth curves thru the center of the soundings. This was corrected and all curves delineated to include the centerline soundings. ✓
2. The 4 & 6 fathom curves were delineated unnecessarily by the field plots. These were omitted. ✓
3. Minus soundings were incorrectly plotted (zero to $-\frac{1}{2}$ were plotted as -1 and minus fractional soundings were generally penciled $\frac{1}{2}$ foot too great) This was corrected and the minus soundings plotted in conformity with #155 of the manual. ✓
4. Some of the notes inked by the field party was located parallel to the object of the notes. This was corrected and all notes inked parallel to the latitude line. ✓
5. H 5844 (1935) and H 5846 (1935) have not been verified and junction with this sheet was not made. ✓
6. Comparison was made with T-6334. ✓

respectfully submitted

C. R. Draper

8/27/35

Verification Report on H-5846 (1935)

1. Conditions of Records.

The records are neat, legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. Day letters were inked opposite each position number instead of every 5th position and at beginning & ending of line. ^{This is characteristic of other sheets in this area sent in by this field party.} ✓
- b. Description notes in the records such as piling and snags were not consistently plotted on the Boat Sheet and Sounding Sheet. These were added to the latter in the office. ✓
- c. Lat. & Long. figures & numbers were shown to the nearest tenth such as $47^{\circ}36.5$ instead of $47^{\circ}36'30''$ which is the usual practice. ^{This is characteristic of other hydro as well as topog sent in by this party.} ✓

2. Shoreline & Signals

The shore line and signals shown on this sheet original with Plane Table mounted sheets no. T-6330, 6333 and 6334 (all 1935 surveys). ✓

3. Soundings Line Crossing

Considering the rapid change in bottom, agreement of cross lines that result from the work in inshore areas are satisfactory.

Generally speaking, no cross lines were run in offshore areas extending beyond $\frac{1}{8}$ mile ~~from~~ off the shore or dock line. ✓

4. Depth Curves.

The usual depth curves may be satisfactorily drawn including portions of the low water, 6, 12 and 18 foot curves. In this connection, portions of the topographic low water line except as modified by ~~any~~ ^{any} recent half foot soundings are thought to be of Hydrographic origin. A classic example is the line off the dock in long ~~122° 22.6'~~ ^{122° 22.6'}. This practice is not recommended since in cases of ^{depth} ~~depth~~, both determinations tend to confirm each other whereas in reality there is but one determination.

5. Junctions with Contemporary Surveys.

a. The junction ~~which~~ with H-5724 (1934-35), H-5845 (1935) and H-5709 (1934-35) are excellent except that in the case of the latter, lines 20 to 21 m in lat. $47^{\circ} 37.4'$, long. $122^{\circ} 23.3'$ consistently varied 1 to 10 feet shallower than these soundings on the present survey. By rejecting the fix and plotting on time and course, the soundings were brought into good agreement. (See Par. 7c of this report)

b. The junction with H-5844 (1934-35) will be considered when that sheet is verified.

6. Field Plotting.

Field plotting and plotting of soundings were excellent except, as follows:

- a. minus soundings such as "-4½" were plotted to the next whole figure such as "-5". These were corrected in the office.
- b. Numerous bottom characteristics were plotted without

regard to the ^{newest} recorded soundings. Many were as much as 500 meters in error. These were corrected in the office. ✓

7. Remarks:

a. A further ^{full} investigation of the 11 and 12^{1/2} foot shoal spots in lat. $47^{\circ} 36'.8$, long. $122^{\circ} 21'.1$ falling in depths of 13 to ¹⁴ 20 feet and within the limits of a dock enclosure.

b. The running of one or two cross lines in a general E-W direction in the general vicinity of lat. $47^{\circ} 35'.3$, long. $122^{\circ} 21'$ would tend to confirm the assumed shoal

areas or spots extending shoreward in this locality. mentioned in Rep.

c. With reference to par. 52 (H-5709) above, several other soundings in this general vicinity on H-5709 vary slightly deeper than those on the present survey. These are due in part to small inaccuracies resulting from enlargement of 4 tiers of soundings on H-5709. These differences are relatively ^{unimportant} and no changes were made. Rf

In connection with H-5845, one 45 foot sounding of that survey was erroneously input as 4 feet. This was corrected. ✓

Verified by Harold W. Murray

Feb. 24, 1936

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5844 (1934-5) FIELD NO. 1

Alki Point to West Waterway, Puget Sound, Washington
Surveyed in Nov. 1934 and April 1935
Instructions dated March 29, 1934 (EXPLORER)

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - Jack Senior.
Surveyed by - W. Weidlich.
Protracted by - F. S. Butler and W. Weidlich.
Soundings penciled by - F. S. Butler.
Verified and inked by - W. L. Moore and H. W. Murray.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. On lines run east and west, the position numbers and day letters were inked with west as the "top of the sheet" instead of North as directed in paragraph 142.
- b. No separate "Approval of Records" signed by the Chief of Party was submitted with the Descriptive Report, (Par. 174).

It is the accepted practice to show intermediate parallels and meridians by seconds of arc rather than fractions of minutes.

The Descriptive Report covers three sheets and though it satisfactorily covers all the items of importance it does not reference them to the sheet to which they pertain.

2. Compliance with Instructions for the Project.

The plan and character of development are in accordance with the instructions for the project.

3. Shoreline and Signals.

The shoreline and signals originate with plane table surveys T-6331 (1934), T-6332 (1934), T-6334 (1935) and T-6266 (1934).

4. Sounding Line Crossings.

No cross lines were run but depths on adjacent lines and on development work are in satisfactory agreement.

5. Depth Curves.

The usual depth curves can be satisfactorily drawn including the low water line except close westward of the West Waterway. (See Descriptive Report, page 4, par. 5).

6. Junction with Contemporary Surveys.

The junctions with H-5845 (1935), H-5846 (1935), H-5709 (1934-5) and H-5725 (1934) are satisfactory.

7. Comparison with Prior Surveys.a. H-432 (1854).

This survey on a scale 1:10,000 is a preliminary survey of Duwamish Bay (Elliot Bay) and many of the soundings in the deeper area are "no bottom" soundings. Actual depths obtained are in fair agreement with the present survey except close inshore where there have been many changes caused by improvements along shore. None of the information from this survey is in use on the present chart and it would serve no useful cartographic purpose to list the changes in detail.

b. H-1337b (1875), H-1338a (1875), H-1425a (1877-8).

These surveys on a scale 1:10,000, 1:40,000 and 1:20,000 respectively are the basis for the present charting of the offshore area. The soundings outside the 18 foot curve are in good agreement with the present survey. Close inshore the depths have changed, shoaling in some places and deepening in other places, due to improvements and the construction of bulkheads along shore. The older survey used a plane of reference 3.7 feet below M.L.L.W. which resulted in increased distance between high water line and zero curve on the above surveys. There are no special features that need to be retained. Because the present survey is on much larger scale and shows close development of the area, H-5844 (1934-5) should supersede the above surveys in future charting of the area common to them.

c. H-2489 (1900), H-3372 (1912), H-3372a (1914), H-4015 (1917)

These surveys (the first on a scale 1:10,000, the others on a scale 1:5,000) cover the approach to the West Waterway and the inshore features northward to Duwamish Head. The area is constantly changing due to improvements and the rebuilding of wharves so that no useful cartographic purpose would be served by listing differences in detail. All the above surveys should be superseded by H-5844 (1934-5) in future charting of the area common to them.

8. Comparison with Chart 6449 (New Print dated June 20, 1935).a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs and on U. S.

Engineers survey (blue print 21742 of 1927) for some details at the entrance to the West Waterway. The present survey shows that some changes in detail of wharves have taken place and that the bulkhead and fill have disintegrated. The blue print should be superseded by H-5844 (1934-5) for future charting.

b. Aids to Navigation.

The charted positions of the bell buoy, latitude 47°36', longitude 122°23.2', and the western mooring buoy latitude 47°35.4', longitude 122°22.2', are in agreement with the present survey. The other mooring buoy charted 400 meters to the eastward has been discontinued. (Noted on file copy of Aid to Navigation, Chart 6449.)

9. Field Plotting.

The protracting of positions was very accurate and the field drafting in general was excellent.

10. Doubtful Sounding.

The sounding following position 105d (red) was recorded as 35 fathoms, reduced to 199 feet. The bottom in the vicinity is mud, and adjacent soundings would indicate that the depth should be 45 fathoms. This is also indicated by the length of time the launch was stopped for the sounding (50 sec.) which is longer than the time usually taken for the lesser depth. However, as there was no definite reason for rejecting it, the 199 has been plotted on the sheet, latitude 47°35.15', longitude 122°24.65'.

11. Note to Compiler.

Attention is directed to a correction of the Alaska Steamship Company wharf in latitude 47°35.30', longitude 122°22.65' on T-6331 (1934). This wharf was rebuilt following the completion of the topographic survey and was located by sextant fixes as shown on H-5844 (1934-5).

12. Additional Field Work Recommended.

The survey is very satisfactory and no further work is required.

13. Superseding Old Surveys.

Within the area covered, the present survey supersedes the following surveys for charting purposes:

H-432	(1854)	in part
H-1337b	(1875)	" "
H-1338a	(1875)	" "
H-1425a	(1877-8)	" "
H-2489	(1900)	" "

H-3372 (1912) in part
H-3372a (1914) " "
H-4015 (1917) " "

14. Reviewed by - R. J. Christman, March 12, 1936.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

L. O. Polbat
Chief, Division of Charts.

Fred. L. Peacock
Chief, Section of Field Work.

G. H. Hude
Chief, Division of H, & T.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5845 (1935) FIELD NO. 1a.

Duwamish Waterways, Elliott Bay, Washington
Surveyed in May 1935
Instructions dated March 29, 1934 (JACK SENIOR)

Hand Lead and Machine Soundings.

3 Point Fixes on Shore signals.

Chief of Party - Jack Senior.
Surveyed by - W. Wiedlich.
Protracted by - F. S. Butler.
Soundings penciled by - F. S. Butler.
Verified and inked by - C. R. Draper.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual.

The Descriptive Report is complete and adequately covers all matters of importance.

2. Compliance with Instructions for the Project.

The survey satisfies the instructions for the project.

3. Shoreline.

The shoreline and topographic signals originate with T-6334 (1934).

4. Sounding Line Crossings.

No cross lines were run. However, the adjacent parallel lines are in good agreement.

5. Depth Curves.

The depth curves may be satisfactorily drawn.

6. Junctions with Contemporary Surveys.

The junctions with H-5844 (1935) on the north at West Waterway and with H-5846 (1935) on the north of East Waterway will be considered in the reviews of those surveys. The junction on the south with the U. S. Engineers survey, blue print 26967 (1932) is satisfactory.

7. Comparison with Prior Surveys.

a. H-432 (1854)
H-1337b (1875)
H-2489 (1900)
H-2489a (1909)

H-3372 (1912)
H-3372a (1914)
H-4015 (1917)

A comparison between these old surveys and the present survey shows extensive changes in depths and delineation of shoreline, all of which has been artificially created by dredging of channels and filling in of marsh areas in the creation of the two waterways. Considering the fact that the most recent of the above prior surveys are prior to any dredging operations and that they all are prior to the most recent operations by the U. S. Engineers, it is unnecessary to consider in detail, from the standpoint of information to be carried forward, the various changes noted. The present survey within its limits should supersede all of the above surveys for charting purposes.

8. Comparison with Chart No. 6449.

a. Hydrography.

Within the area of the present survey the chart is based on surveys by the U. S. Engineers. They are in good agreement with the present survey with the exception of a few soundings that are a few feet shoaler than the present depths. The most important of these are the following:

1. The two 30-foot soundings at latitude $47^{\circ} 34.94'$, longitude $122^{\circ} 20.56'$, and latitude $47^{\circ} 34.43'$, longitude $122^{\circ} 21.48'$, originating with U. S. Engineers blue print No. 22835 (1929) and No. 26967 (1932) falls on the present survey in depths of 39 and 32 feet respectively. Considering the fact that the bottom is consistently mud, that the shorelines on both sides are artificial made ground from dredged material, and that the area is subject to considerable erosion by the river and tidal currents (see Descriptive Report, page 1, of H-4016 (1917), and Chart Letter 528 (1929) from Inspector, Seattle Office), the area is therefore considered changeable and the 30 foot soundings should be disregarded in future charting.

b. Aids to Navigation.

The beacons and the one buoy shown on the present survey are in substantially the same positions as charted.

9. Field Plotting.

The field plotting was satisfactory.

10. Additional Field Work Recommended.

No additional work is required.

11. Superseding Old Surveys.

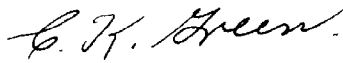
Within its limits, the present survey supersedes the following surveys for charting purposes:

H-432 (1854) in part.
H-1337b (1875) in part.
H-2489 (1900) in part.
H-2489a (1909) entirely.
H-3372 (1912) in part.
H-3372a (1914) in part.
H-4015 (1917) in part.


12. Reviewed by - John G. Ladd, September 17, 1935.


Inspected by - A. L. Shalowitz.

Examined and approved:


C. K. Green,
Chief, Section of Field Records.


Chief, Division of Charts.


Chief, Section of Field Work.


Chief, Division of H. & T.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5846 (1935) FIELD NO. 2

Smith Cove to East Waterway, Elliot Bay, Washington
Surveyed in February - May 1935
Instructions dated March 29, 1934 (EXPLORER)

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - Jack Senior.
Surveyed by - W. Weidlich.
Protracted by - F. S. Butler.
Soundings penciled by - F. S. Butler.
Verified and inked by - H. W. Murray.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual.

It is usual practice to show intermediate parallels and meridians as seconds of arc, i. e., latitude 36'30", instead of 36'.5.

The Descriptive Report is complete and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The plan and character of development are in accordance with the instructions for the project, except that the two flat areas extending northward of Harbor Island (latitude 47°35.3', longitude 122°20.8') should have had closer development.

Easternmost
area developed
See note, page
10b, this report.
H.W.M. 4/24/37

3. Shoreline and Signals.

The shoreline originates with plane table surveys T-6330, T-6333 and T-6334, all of 1935.

The signals are from 1934 triangulation and from the above plane table surveys.

4. Sounding Line Crossings.

No general system of cross lines were run. Where crossings result from inshore development lines the agreement is satisfactory.

5. Depth Curves.

Within the limits of the survey the usual depth curves may be satisfactorily drawn.

6. Junction with Contemporary Surveys.

Junctions with H-5709 (1934-5), H-5724 (1934-5) and H-5845 (1935) are satisfactory.

The junction with H-5844 (1935) will be considered in the review of that sheet.

7. Comparison with Prior Surveys.a. H-432 (1854).

This survey, scale 1:10,000, shows widely spaced lines with mostly no bottom soundings in the deeper part of Elliot Bay. Along shore there have been numerous changes due to the construction of wharves and other improvements. No part of the information on this sheet is in use on the present charts.

b. H-1337b (1875).

This survey, scale 1:10,000, is in good agreement with the present survey in the deeper areas, except in the vicinity of latitude $47^{\circ}36.7'$, longitude $122^{\circ}21.2'$, where the bottom has shoaled due to the depositing of material during the hydraulic grading of the adjacent hill. The 1875 survey is the authority for the sounding on the present chart outside the 15 to 20 fathom depth (90 to 120 feet) but the inshore soundings and waterfront details are from H-2489 (1900) but prior to the hydraulic fill. Because of the larger scale and closer development of the present survey, H-5846 (1935) should supersede the above survey for future charting purposes.

c. H-2489 (1900), H-2489a (1909).

These are surveys of the Seattle waterfront and Smith Cove on a scale of 1:10,000. The waterfront has changed greatly due to improvements and new wharves. Outside the pier head line, depths are in good agreement with the present survey. The soundings in the East Waterway (H-2489a of 1909) and in Smiths Cove have been superseded on the charts by later surveys. Because of the many changes, as well as the larger scale and closer development of the present survey, H-5846 (1935) should supersede the above surveys in future charting.

d. H-3372 (1912), H-3372a (1914), H-3999 (1917), H-4015 (1917)

These are special examinations on a scale 1:5000 of the East and West Waterways and of Smith Cove. They show progressive changes due to the construction of wharves and other improvements and no useful cartographic purpose would

be served by listing differences in detail. Because of the large scale and close development of the present survey, H-5846 (1935) should supersede the above surveys for future charting purposes.

8. Comparison with Chart 6449 (New Print dated June 20, 1935).
Chart 6447 (New Print dated April 24, 1935).

a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs and on the following miscellaneous information:

- (1) Blue print 17587 (1921) and letter 81/1921 are authority for the wharves and the depths charted at Smith Cove. The present survey shows that some shoaling has taken place in the dredged area between the wharves and the information from the blue print should be superseded in future charting.
- (2) Blue print 16843 (1918) is in good agreement with the present survey at the entrance to the East Waterway. The present survey is adequate for charting purposes and the above blue print should be superseded.

b. Aids to Navigation.

The charted aids to navigation within the area under consideration are in agreement with the locations given by the survey.

9. Field Plotting.

The protracting of positions and penciling of soundings were satisfactory but some of the descriptive notes in the "Remarks" column of the Sounding Record were not plotted. These have been added in the office. Minus soundings were plotted to the greater whole number instead of to the lower whole number, i. e. recorded - 4-1/2 was plotted -5 instead of -4.

10. Additional Field Work Recommended.

The survey is very satisfactory and no further work is required except as follows:

- a. A field check of the 11 foot and the 12 foot spots on the middle ground extending out from the bulkhead between the wharves in latitude 47°36.8', longitude 122°21.1', would be desirable.

Confirmed. On sewer outlet. For discussion see Rev. (par. 3-6) of Add'l Wk. (1936) attached to D.R. of H-5710.
H.W.M. 1/26/37

- b. The shoal spit extending northward off the west side of East Waterway (latitude 47°35.3', longitude 122°20.8') should have additional development.

Developed for discussion, See Rev. Cpar. B-7 of Add'l wk (1936) attached to D.R. of H-5710. H.W.M. 1/26/37

11. Superseding Old Surveys.

Within the area covered, the present survey supersedes the following surveys for charting purposes:

H-432	(1854)	in part	H-3372	(1912)	in part
H-1337b	(1875)	" "	H-3372a	(1914)	" "
H-2489	(1900)	" "	H-3999	(1917)	entirely
H-2489a	(1909)	" "	H-4015	(1917)	in part

12. Reviewed by - R. J. Christman, March 2, 1936.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green.*
Chief, Section of Field Records.

L. O. Pollock.
Chief, Division of Charts.

Fred. R. Peacock
Chief, Section of Field Work.

W. H. White
Chief, Division of H. & T.

Hyd. 5844 applied to Cht. 6449 May 28, 1936 - K.R.
Hyd. 5845 " " " " June 1, 1936 - K.R.
Hyd. 5846 " " " " June 5, 1936 - K.R. (Including Addl. work, 1936)
Hyd. 5844 " " Cht. 6444 Nov. 4, 1936 - K.R. ^{Apr. 20, 1937}
Hyd. 5846 " " " 6450 Sept. 10, 1936 - K.R.
" " " 6460 Apr. 21, 1937 - K.R.
Hyd. 5844 " " " 6450 Sept. 20, 1936 - K.R.
Hyd. 5846 ~~5846~~ 6447 July 10, 1943. New.

H 5844 applied to chart 6446 March 5, 1946 Law.
H-5846 - App'd to New Cht 6442 - 9/10/64 - GRJ
H-5844 - App'd to New Cht 6442 - 9/22/64 - GRJ
H-5845 - App'd to New Cht 6442 - 9/30/64 - GRJ
H-5844 App'd to New chart 18474 (Thru 18449) 1-10-84
D.C. Hopkins

5930

(And Additional Wk. 1936,
For Which SEE 5710,
Addl Wk. 1936 D.R.)

U. S. COAST & GEODETIC SURVEY
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Acc. No. _____

5930

(Add Addl Wk 1936,
For Which SEE 5710
Addl. Wk. 1936 D.R.)

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, Director

State: WASHINGTON

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 4
Hydrographic }

LOCALITY

NORTH END COLVOS PASSAGE

PUGET SOUND

1935.

CHIEF OF PARTY

Jack Senior

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

HYDROGRAPHIC TITLE SHEET

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. 4REGISTER NO. **H5930**State WashingtonGeneral locality Puget SoundLocality North end of Colvos PassageScale 1:10,000 Date of survey April & May, 1935.Vessel U.S.C. & G.S.S. EXPLORERChief of Party Jack SeniorSurveyed by W. WeidlichProtracted by H. H. HardySoundings penciled by W. WeidlichSoundings in fathoms ~~feet~~ and fractions thereof.Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by _____

Verified by _____

Instructions dated March 29, 1934.

Remarks: _____

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 4

NORTH END COLVOS PASSAGE

PUGET SOUND - WASHINGTON

1935

AUTHORITY:

The hydrography on this sheet was executed under instructions of the Director of the U. S. Coast and Geodetic Survey, dated March 29, 1934.

SCALE:

The scale is 1:10,000 and soundings are in fathoms and fractions thereof.

LIMITS:

This survey covers the entire navigable area of Colvos Passage from the north entrance to Latitude 47° 24', connects at its northern limit with hydrographic sheet No. 4, (1:10,000) and sheet No. 8 (1:20,000) season of 1934, at its southern limit with sheet No. 5 (1:10,000) season of 1935.

METHODS:

The approved methods of the service were used throughout. The launch "Delta" was used for all the work and the letters are shown in red.

A ten pound handlead was used in depths of less than 15 fathoms and in greater depths an eighteen pound lead, steam sounding machine and stranded wire.

The lines run east and west and on account of the great depths in the comparatively narrow passage, are spaced 200 meters apart with splits between near the shores.

All sounding lines were run on ranges and no compass courses were used. All soundings are up and down.

LOW WATER LINE:

An effort was made to determine the low water line as much as possible, but on account of the prevailing low and minus tides while this survey was in progress, it was impossible to approach the shore any closer without undue hazard to the launch and loss of time.

In practically all cases, especially when ending the lines, the estimated distance from the low water line was recorded.

TIDES:

Tide reducers were obtained from the records of the automatic tide gages maintained at Gig Harbor and Quartermaster Harbor.

CONTROL:

Triangulation and topography furnish the necessary control.

On account of the very smoky and hazy weather and not being able to see even the largest signals against the sun, additional signals were built at the southern limits of the sheet, by the hydrographic party, and located by sextant fixes.

These fixes are recorded in volume No. 1, pages 3, 4 and 5. On account of the very poor visibility at that time and some of the fixes being very weak, due to the limits of the sheet, another set was taken a few months later and the results recorded in volume No. 5, pages 25 and 26.

Signals "Gab" and "Gib" located by the hydrographer, are situated at the west shore of Colvos Passage. They are prominent stumps, well anchored in sandy bottom some distance off-shore, near the low water line.

Signal "Nov" is a pile north of triangulation station "Viewpark"; signal "Eit" is a large boulder north of Command Point, and signal "Pile", a cluster of piling north of triangulation station "Olalla".

CHARACTERISTICS OF BOTTOM AND SHORELINE:

The bottom is generally sandy in deeper water; rocky and sandy near the shore, with extensive sand and gravel beaches between. The small spits on either side of the passage consist of gravel and sand.

South of Southworth Point, between signals "Feb" and "May", the beach is studded with small boulders which bare from 2 to 3 feet at low tides. Two boulders which bare about 6½ feet at M.L.L.W. were located by topography.

* See pos. 54 J +
pos. 62 J in
Sounding Record
No. 4.

For additional information, see remark column, volume No. 3, page 71.

** This information is practically a repetition of the data in previous paragraph.*

The south shore of Fern Cove, east of Colvos Landing, is studded with small boulders which bare at low tides. These boulders are no menace to navigation, as they are near the low water line. See volume No. 3, positions 28 to 31 "g".

DANGERS AND OBSTRUCTIONS:

This passage is free of dangers and obstructions and in recent years has been used to a great extent by large freight and passenger vessels.

There are several prominent sand and gravel spits in this passage which may be approached close to, as the bottom drops off suddenly into much deeper water.

Sand flats extend for about 400 meters from the shore of Fern Cove and from its limits the water deepens gradually.

Sand flats extend for about 240 meters in the bight about 1/3 mile north of station "Viewpark". The bottom drops off suddenly into much deeper water.

The lagoon immediately north of Olalla Landing bares at low tides and the entrance is also blocked by a small trestle, and numerous old piling. The sand flats extend for some distance and then drops off suddenly into much deeper water.

ANCHORAGES:

Colvos Passage is exposed to strong southerly winds which blow home with considerable force and offers no anchorage to vessels of any size.

During summer months small boats may find anchorage in the small bights. Fern Cove north of Point Peters on the east shore of the passage offers the best anchorage in any desired depth, taking care to avoid the extensive flats in the southeast bight.

The wharves at Lisabeula, Olalla, Cove and Colvos are used daily by a small passenger boat, which operates between Seattle and Tacoma. The other wharves are abandoned and in a state of decay.

CURRENTS:

No current stations were occupied in this area and no doubt all necessary data was obtained by previous current surveys.

The flood runs in a southerly direction with an estimated velocity of from 1 to 2 knots; the ebb runs in the opposite direction, is the strongest, and is greatly accelerated by strong southerly winds, and reaches its maximum velocity at the north entrance of the passage.

Numerous eddies were experienced while the survey was in progress and heavy tiderips were encountered at the entrance to the passage and in the vicinity of Olalla, making it almost impossible to keep the launch on the intended sounding line.

WEATHER:

Forest fires and hazy weather delayed the work a great deal, making it almost impossible to see the largest signals or even houses at a relatively short distance, especially when looking into the sun.

With the exception of a few windy days, the sea was smooth and calm.

Respectfully submitted,

W. Weidlich
W. Weidlich,
Mate, C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Approved and forwarded,

Jack Senior
Jack Senior,
Chief of Party, C. & G. S.,
Comdg. Str. EXPLORER.

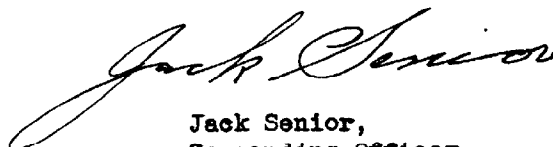
STATISTICS

TO ACCOMPANY HYDROGRAPHIC SHEET #4

DATE	VOL	DAY	BOAT	STAT.	POS.	SOUNDINGS		To &	Total
				MILES		HAND-	MACH.	From Work	Dist. Run
April 29	1	a	Delta	11.7	86	123	139	1.0	12.1
" 30	1	b	"	<u>17.9</u>	<u>160</u>	<u>285</u>	<u>200</u>	<u>4.0</u>	<u>20.6</u>
Total; April:				29.6	246	408	339	5.0	32.7
May 1	2	c	"	8.6	75	95	118	1.5	10.0
" 6	2	d	"	5.5	46	63	73	0.8	5.6
" 7	2	e	"	20.0	165	253	246	3.9	23.3
" 8	3	f	"	20.7	161	337	212	2.0	22.0
" 9	3&4	g	"	18.7	152	340	184	3.5	20.8
" 10	4	h	"	7.0	58	82	100	1.5	7.6
" 11	4	j	"	20.0	200	365	215	1.0	20.4
" 12	5	k	"	<u>9.2</u>	<u>104</u>	<u>187</u>	<u>91</u>	<u>1.5</u>	<u>11.5</u>
Total; May:				109.7	961	1722	1239	15.7	121.2
Total For Sheet:				139.3	1207	2130	1578	20.7	153.9

Smooth hydrographic field sheet

No. 4 and the accompanying records have been examined and are
approved. ✓



Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

April 2, 1936.

✓ Division of Charts: Attention: Mr. E. P. Ellis

Tide Reducers are approved in
5 volumes of sounding records for

HYDROGRAPHIC SHEET 5930

Locality North End Colvos Passage, Puget Sound

Chief of Party: Jack Senior in 1935

Plane of reference is mean lower low water reading

2.6 ft. on tide staff at Quartermaster Harbor

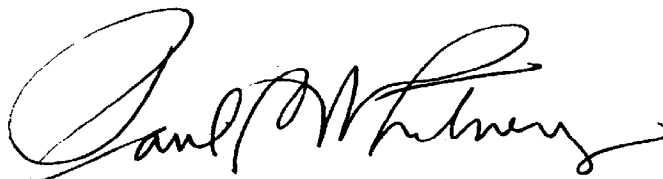
16.4 ft. below B.M. 3

4.1 ft. on tide staff at Gig Harbor

10.3 ft. below B.M. 1

Height of mean high water above plane of reference is 11.0 ft.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

GEOGRAPHIC NAMES

Survey No. **H5930**

Name on Survey	Source										No.
	A	B	C	D	E	F	G	H	K	MEMORIES	
	On Chart No. 6460	On previous survey No.	On U. S. Coast and Geodetic Survey Maps 1871-1914	From local information GEOG. DIV. U.S. NAVY.	On local Maps	P. O. Guide or Map	Rand McNally Atlas	U. S. Light List			
<u>COLVOS PASSAGE</u>	✓	1452	✓	✓				✓		✓	1
<u>VASHON I.</u>	✓	1452	✓	✓				✓		✓	2
<u>PT. SOUTHWORTH</u>	✓	1452	✓ SYNONYM QUAD	✓						✓	3
<u>VIEW PARK</u>	✓	1452									4
<u>FRAGARIA</u>	✓	1452		✓		✓	✓			✓	5
<u>COMMAND PT.</u>	✓	1452 PT. COMMAND	✓ PT. COMMAND	✓							6
<u>OLALLA</u>	✓	1452	✓	✓		✓	✓				7
<u>PT. SANDFORD</u>	✓	—	✓	✓ PT. SANDFORD.						✓	8
<u>LISABEULA</u>	✓	—	✓ LYS-ABEULA	✓		✓	✓			✓	9
<u>COVE</u>	✓	—	✓	✓		✓	✓				10
<u>PT. PETER</u>	✓	1452	✓ PETER PT. (TRONIA QUAD)	✓							11
<u>COLVOS</u>	✓	—		✓		✓				✓	12
<u>PT. VASHON</u>	✓	1452	✓ SYNONYM QUAD	✓				✓		✓	13
<u>ca</u>											14
											15
Names approved Jan. 16 1936											16
O'Keefe											17
											18
											19
											20
											21
											22
											23
											24
											25
											26
											27

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H5930**

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

Number of positions on sheet	1207
Number of positions checked	26
Number of positions revised	None
Number of soundings recorded	3708
Number of soundings revised	238
Number of signals erroneously plotted or transferred	None

Date: 17 April 1936
Verification by E. C. McGlannon
Review by S. Pisegari

Time: 6 days 4 3/4 hours.
Time: 3 days 14 hrs.

HYDROGRAPHIC SURVEY NO. H5930

Smooth Sheet yes

Boat Sheet 1

Sounding Records 5 Vols. _____

Descriptive Report yes

Title Sheet yes

List of Signals Vol. 1

Landmarks for Charts (Form 567) none *O.K. SR*

Statistics yes

Approved by Chief of Party yes

Recoverable Station Cards (Form 524) none

Special Chart for Lighthouse Service no
(Circular Nov. 30, 1933)

Remarks _____

MEMORANDUM

IMMEDIATE ATTENTION

~~SURVEY~~
 DESCRIPTIVE REPORT } No. H 5930
~~PHOTOGRAPH # OF~~ } ~~None~~

{ received Jan. 2, 1936
 registered Jan. 11, 1936
 verified
 reviewed
 approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25		<i>ewj</i>	
26			
✓ 30			<i>Page 4 # 2</i>
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	
----	--

C. K. Green

Jan. 14, 1936

Report on H 5930

1. The records conform to the requirements of the General Instructions.
2. The usual depth curves can be completely drawn within the limits of the sheet. The zero curve was dashed in a number of places along the shore in order to show the plane of reference.
3. The field plotting was completed to the extent prescribed in the Hydrographic Manual. The field plotter placed additional bottom characteristics on the smooth sheet which were not recorded in the records.
4. The office draftsman did not have to do over any part of drafting done by the field party except as noted on the statistic sheet.
5. The junctions with contemporary adjacent sheets, H 5711, and H 5725 were found to be satisfactory. The junction with H 5931 will be considered when this sheet

has been verified and inked.
6. At this time there are no
topographic sheets, covering this area,
available. Consequently the verifier,
was not able to check the
shoreline and signals.

Respectfully submitted,
G. C. McElrosson

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5930 (1935) FIELD NO. 4

North End of Colvos Passage, Puget Sound, Washington
Surveyed in April - May 1935
Instructions dated Mar. 29, 1935

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - J. Senior.
Surveyed by - W. Weidlich.
Protracted by - H. H. Hardy.
Soundings penciled by - W. Weidlich.
Verified and inked by - G. C. McGlasson.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual.

The Descriptive Report is complete and comprehensive and satisfactorily covers all matters of importance except that no information was included under "Dangers and Obstructions" page 3, regarding the charted rock awash at Olalla which was reported to bare at 1/2 tide. (See par. 8(3) this review). Rock located. See note, par. 8(3), this review.

2. Compliance with Instructions for the Project.

The plan and character of development of the survey are in accordance with the instructions for the project, except that the charted rock awash at Fragaria and at Olalla should have been investigated.

3. Shoreline and Signals.

The shoreline and topographic signals originate with plane table surveys T-6438 (1935) and T-6439 (1935).

The hydrographic signals were determined by sextant angles during the present survey and are recorded in sounding volumes 1 and 5.

4. Sounding Line Crossings.

Practically no cross lines were run, but the agreement in depth on adjacent parallel lines is good.

5. Depth Curves.

The usual depth curves may be satisfactorily drawn including portions of the low water line.

6. Junctions with Contemporary Surveys.

The junction with H-5711 (1934-35) on the north is satisfactory.

The junction with H-5725 (1934) on the northeast is satisfactory.

The junction with H-5931 (1935) on the south will be considered in the review of that sheet.

7. Comparison with Prior Surveys.

H-1425a (1877-78), H-1426a (1878).

These surveys, on a scale of 1:20,000, cover the entire area of Colvos Passage, covered by the present survey; H-1425a (1877-78) covering the area north of approximate latitude $47^{\circ}26'$, and H-1426a (1878), south of latitude $47^{\circ}26'$. The surveys are in fair agreement with the present survey.

The sounding records of the old surveys note a number of boulders not definitely located, that fall inside the low water line adjacent to the shore. These boulders were not located on the present hydrographic and topographic surveys and the notations "small boulders" have been added to H-5930 (1935) in these areas. The present survey adequately covers the common area and because of the larger scale and much greater detail it should supersede H-1425a (1877-78) and H-1426a (1878).

8. Comparison with Chart No. 6460 (New Print dated Sept. 24, 1935).a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs with the following exceptions:

- (1) The dock at Fragoria in approximate latitude $47^{\circ}27.8'$, longitude $122^{\circ}31.8'$, and the dock at Biloxi in approximate latitude $47^{\circ}30.3'$, longitude $122^{\circ}28.5'$ were sketched on a section of a chart by an officer of this Bureau. (Chart Letters No. 277 of 1928 and No. 663 of 1933).
- (2) The rock awash at Fragoria (latitude $37^{\circ}27.75'$, longitude $122^{\circ}31.9'$) was sketched on a section of chart in its reported position by an officer of this Bureau. (Chart letter No. 663 of 1933). This rock falls inside the low water line about 120 meters northwest of the bare rock shown on the present survey. Because it was charted in a reported position and no other outstanding rock was found by the present hydrographic or topographic survey in this area these rocks are considered to be the same rock.

For charting purposes the present survey should supersede the information noted in paragraphs (1) and (2).

- (3) The charted rock awash at Olalla (lat. 47°25.3', long. 122°32.3') originating with Chart Letter No. 663 of 1933, falls inside the low water line in a blank area on the present survey. The position of the rock was reported to an officer of this Bureau and was sketched on a section of chart 6460 with the notation that "Several fishing boats and tugs reported to have struck same. Said to bare at 1/2 tide", which is approximately 5 feet above M.L.L.W. This rock was not searched for during the present survey and from a study of the few sounding lines in the vicinity it is quite probable that it was covered as there was a 4-1/2 foot tide at the time. It is recommended that this rock be retained on the charts until definitely disproved.

*Confirmed.
For discussion
see Rev. (par.
B-11) of Add'l
work (1936)
attached
to D. Rat
H-5710.
H.W.M. 1/25/37*

9. Field Plotting.

The protracting and plotting of soundings were well done. In some cases, the field plotter placed more bottom characteristics on the sheet than were recorded in the sounding volumes.

10. Additional Field Work Recommended.

This survey is complete and satisfactory. However, the general area in the vicinity of the reported rock at Olalla should be further developed. (See par. 8(3) this review). *Rock confirmed, see note above, par. 8(3).*

11. Superseding Old Surveys.

Within the area covered the present survey, with the indicated additions from previous surveys, supersedes the following surveys for charting purposes:

H-1425a (1877-78) in part
 H-1426a (1878) " "

- 12. Reviewed by - G. Risehari, May 13, 1936.

Inspected by - R. J. Christman, May 29, 1936.

Examined and approved:

C. K. Green
 C. K. Green,
 Chief, Section of Field Records.

L. O. Pollett
 Chief, Division of Charts.

Fred. L. Peacock
 Chief, Section of Field Work.

G. Wade
 Chief, Division of H. & T.

Applied to Cht. 6460 Apr. 30, 1938 K.P.

25 Jan 17, 1936
L.M.C.

Applied to Chart 6446 Feb 5, 1946 L.M.C.

5931

(And Addl. Wk. 1936,
For Which SEE 5710,
Addl. Wk. 1936 D.R.)

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Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

R. S. Patton, Director

State: WASHINGTON

DESCRIPTIVE REPORT

~~Topographic~~
Hydrographic } Sheet No. 5

LOCALITY

South End of
~~GANDFORD PT.~~, COLVOS PASSAGE

~~to EVANS PT. LIGHT~~

~~THE NARROWS~~

PUGET SOUND

1935.

CHIEF OF PARTY

Jack Senior.

U. S. GOVERNMENT PRINTING OFFICE: 1923

5931

(And Addl. Wk. 1936,
For which SEE 5710,
Addl. Wk. 1936 D.R.)

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

HYDROGRAPHIC TITLE SHEET

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. 5

REGISTER NO. **H5931**

State Washington

General locality Puget Sound

Locality South End of Sandford Pt., Colvos Passage to Evans Pt. Light/
The Narrows.

Scale 1:10,000 Date of survey April-May-June-Oct., 1923

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by W. Weidlich, H. H. Hardy

Soundings penciled by W. Weidlich

Soundings in fathoms ~~xxx~~ and fractions thereof.

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by John G. Ladd

Verified by

Instructions dated March 29, 1923.

Remarks:

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 5

SANDFORD PT., COLVOS PASSAGE TO EVANS PT. LIGHT,

THE NARROWS

PUGET SOUND - WASHINGTON

1935

AUTHORITY:

The hydrography on this sheet was executed under instructions of the Director of the U. S. Coast & Geodetic Survey, dated March 29, 1934.

SCALE:

The scale is 1:10,000 and soundings are in fathoms and fractions thereof.

LIMITS:

This survey covers the entire navigable area of the southern part of Colvos Passage, eastern part of Dalco Passage and the northern part of The Narrows. It connects at the northern limits with hydrographic sheet No. 4, at its eastern limits with sheet No. 6 and at its southern limits with sheet No. 8.

METHODS:

The approved methods of the service were used throughout. The launch "Delta" was used for all the work and the letters are shown in red.

A ten pound handlead was used in depths of less than 15 fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire.

Practically all the lines run east and west, spaced 200 meters apart, with splits between. In immediate vicinity of Point Defiance the lines are spaced 100 meters apart and near the steep shores, much closer. In The Narrows the lines are spaced 100 meters apart, with no splits between as zero soundings were obtained practically at all ends of lines.

West of Longitude 122° 31' the lines run north and south as far as station "Def".

In Gig Harbor the lines run east and west, spaced 100 meters apart. Channel lines were run at the entrance to Gig Harbor and spaced as close as possible.

All sounding lines were run whenever possible on ranges and no compass courses were used. All soundings are up and down.

On account of the strong westerly set which runs at all times in the vicinity of Point Defiance, it was impossible to run the lines normal to the shore.

Positions 1 to 14 and 52 to 58 "r" day, sheet No. 6, are transferred to this sheet, to show the additional work more clearly. *

** Since there was no transfer in the records the positions mentioned have been left for sheet 6 and will be shown on this survey as overlaps. J.S.L.*

CONTROL:

Triangulation and topography furnish the necessary control. Additional signals were built above Richmond Point, Colvos Passage and located by the hydrographic party to supplement those established by the topographic party. Volume No. 1, pages 3 and 4.

CHARACTERISTICS OF BOTTOM AND SHORELINE:

The bottom in Colvos Passage is generally sandy and uniform in deep water, rocky, sandy with gravel beaches near the shore.

In Dalco Passage the bottom is muddy and very irregular. At the south shore the bottom is sandy with long sand and gravel beaches.

The bottom in The Narrows is rocky and very irregular. Near the shore, rocky and sandy with occasional gravel.

In Gig Harbor the bottom is muddy and uniform in the basin; at the entrance, sandy and somewhat irregular.

The shore in the immediate vicinity of Point Defiance is steep and abrupt and deep soundings were obtained within a few meters of the low water line. Bottom offshore is very irregular.

KELP:

Colvos Passage is comparatively free of kelp while some kelp was found in the vicinity of Dalco Point, Point Defiance, at the entrance to Gig Harbor and along the shores of The Narrows.

TIDES:

Tide reducers were obtained from the records of the automatic portable tide gauges maintained at Gig Harbor and Quartermaster Harbor.

COMPARISON WITH PREVIOUS SURVEYS:

A few shoals were located that are not shown on chart No. 6460 and a few depths reduced. In general, the soundings agree with those obtained in previous surveys.

DANGERS AND OBSTRUCTIONS:

The area covered by this survey is free of dangers and obstructions. A few boulders were located near the shore, close to the low water line and consequently are not a menace to navigation.

No. 1 A bank with a least depth found of 18 fathoms at M.L.L.W., lies about 1 mile, 290° from Dalco Point. Bottom is rocky and sandy. This bank covers an area of about 600 square meters and splits were run to the 20 fathoms curve.

No. 2 A bank with a least depth found of 17 fathoms at M.L.L.W., lies about 770 meters, 355° from Point Defiance Light. This bank extends in an easterly and westerly direction for about 350 meters and the 17 fathoms spot marks the west limits of the 20 fathoms curve. Bottom is sandy and rocky. Position 59 "1".

No. 3 As mentioned in "Character of Bottom and Shoreline", the bottom is very irregular in the vicinity of Point Defiance. A line of soundings was run on "g" day, following the shore as close as possible as safety to the launch would permit.

Position 25 "g" started out with a 4 1/2 foot sounding, increasing in depth very rapidly. Position 26 "g" gives a depth of 13 fathoms. The range of tide was 8 feet at that time. *stage*

On "l" day a line was run from position 25 to position 27 at a 1 foot minus tide, when the low water line was exposed. The low water line was followed at a distance of from 2 to 5 meters and the following results were obtained: At position 26 "l", a sounding of 8-1/4 fathoms was obtained a few meters inside of a 11 fathoms sounding obtained on "g" day. A 10 fathoms sounding a few meters outside of the 7-3/4 fathoms sounding obtained on "g" day and a 9-3/4 fathoms sounding a few meters north of the 8 foot sounding obtained on "g" day (position 25 "g"). These soundings should be accepted as correct as it is known to the author of this report that the bottom drops off suddenly at the edge of the bank.

Positions 46 to 51 "l" indicate a line of soundings run at the edge of thick kelp, with the current. See remark column, volume No. 6, page 48, "Running along through kelp, 8 meters off the low water line."

Position 51 "l", increased speed, local easterly set (back eddy), kelp inshore alongside rocky shelf.

Off Point Defiance Light, where the shoreline is steep and abrupt, the following notes were entered in the remark column:

Position 28 "l". Line begins 10 meters offshore, steep rocky shelf with a depth of 11 fathoms. Rocky bottom.

Positions 46-47 "g". Position 46; 15 fathoms, rocky; next sounding obtained, minus 1/2 fathoms with the remark "edge of drop-off". Line ends on position 47 "g" with a minus 2 foot sounding.

Position 48 "g". Line turns right (actually begins) with an 11 fathoms sounding with the following note in the remark column: "drop-off 20 meters off sandy beach".

Although there are only a few soundings west of the light, the area is clear and free of obstruction.

On "j" day, some development was done south of the light and it was the intention to drop a few soundings off the light. Current was too strong, launch drifted too fast over the ground and soundings taken at that time would have been of a very doubtful character.

No. 4 Some doubt exists about a $2\frac{1}{2}$ fathoms sounding which lies about 200 meters, 283° from signal "Mary". Positions 108 to 109 "g".

$\frac{1}{2}$ plotted
OK
J.G.L.

Additional soundings were dropped in this vicinity on "j" day, but on account of the strong northerly set, the party failed to obtain soundings on the same spot. The bottom is rocky.

No. 5 A sounding of 13 fathoms between 15 fathoms, position 10-11 "h", lies about 210 meters, 244° from signal "Ces".

Additional soundings were taken on "j" day and 12 and 14 fathoms soundings obtained about 50 meters south of the 13 fathoms spot. Positions 133-141-142 and 143 "j". The bottom is rocky.

No. 6 The sounding of 5 feet between positions 32 and 33 at the entrance to Gig Harbor should be rejected. Cross lines were run on "l" day and all soundings obtained about that spot are all over 2 fathoms. If this 5 foot spot was in existence, the ferry boats entering Gig Harbor would have hit that spot long ago and the fact would be known to the public.

*
not plotted
J.G.L.

No. 7 Shoal area extends for about 50 meters in a southeasterly direction from a small sandy point on which signal "Mus" is located. The 8 foot sounding between positions 113 and 114 "l" marks the end of the shoal area with deeper water east of it.

Ferry boats which tie up to the wharves over night at Gig Harbor can not negotiate the passage at low tides, not being able to make the turn necessary to avoid the shoal. This information was obtained from the masters of the different ferry boats.

No. 8 A wreck was located in Gig Harbor about 2 months after the survey was completed. The investigation was made by Mr. Garber after having received information to that effect. For further information see volume 5, page 69.

✓

ANCHORAGES:

Gig Harbor, an inlet about 1 mile long, on the west side of the surveyed area, offers excellent shelter to small vessels in 4 to 6 fathoms, muddy bottom.

The entrance to the anchorage is constricted with a controlling depth of about 12 feet at the middle of the passage. Care should be exercised when rounding the long narrow spit on which a red ~~fixed~~^{fixed} unwatched light is located.

The harbor is the headquarters of numerous small fishing vessels, which tie up to the small wharves and the numerous dolphins located on the west shore of the inlet.

Gasoline, oil and water may be had at the various oil stations. A dry dock, large enough to accommodate the ferry boats, plying in this locality, is situated on the west shore.

CURRENTS:

No current station was occupied in this area and no doubt all necessary data was obtained by previous surveys.

The flood runs in a southerly direction, increases in strength when approaching Point Defiance and merges at the point with the flood which runs through Dalco Passage, causing heavy swirls and tiderips. The estimated velocity of the flood is from 2 to 4 knots at that point.

The ebb which runs in a northerly direction, and follows through Colvos Passage, diminishing in strength. The estimated velocity at Point Defiance is from 3 to 6 knots.

While working east of Point Defiance, it was noticed that the current runs all times in a westerly direction, with a counter eddy near the steep banks. Lines run in a westerly direction were at very much reduced speed, while in the opposite direction, the launch had to go full speed in order to make some headway.

When flooding, the current near the south shore of Dalco Passage, merges with the flood at the point and continues in a southerly direction; when ebbing, meets the ebb at that point and turns north.

While working the The Narrows, numerous counter eddies were experienced while running the regular sounding lines, making it necessary to change course, in most cases, from 8 to 12 points in order to keep the launch on the intended sounding line.

The full strength of the current was not experienced while working in this locality as a time was chosen when the tides were the weakest.

It was also noticed, when negotiating The Narrows with the ship, the best time was made at either ebb or flood tide, by following the east shore of The Narrows at a distance of about 200 meters.

WEATHER:

Although smoky and hazy at times, ideal weather conditions were experienced while the work was in progress. The sea was smooth and calm practically at all times.

Respectfully submitted,

W. Weidlich
W. Weidlich,
Mate, C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Approved and forwarded,

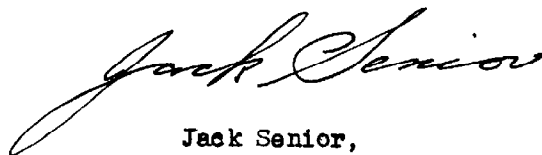
Jack Senior
Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

STATISTICS
 TO ACCOMPANY HYDROGRAPHIC SHEET NO. 5

DATE	VOL.	DAY	BOAT	STAT. MILES	POS.	SOUNDINGS		TO & FROM WK.	TOTAL DIST. RUN
						HAND-	MACH.		
April 25	1	a	Delta	14.1	126	140	242	5.0	19.3
" 26	1	b	"	17.7	153	226	246	4.0	20.4
" 28	1	c	"	19.9	153	149	507	3.5	21.8
" 29	2	d	"	<u>5.2</u>	<u>54</u>	<u>157</u>	<u>58</u>	<u>1.0</u>	<u>7.3</u>
Total, April:				57.6	486	652	853	11.5	68.8
May 13	2	e	"	15.9	164	235	175	2.0	17.8
" 14	223	f	"	<u>19.8</u>	<u>153</u>	<u>183</u>	<u>242</u>	<u>2.5</u>	<u>21.7</u>
Total, May:				35.7	317	418	417	4.5	39.5
June 23	324	g	"	20.5	161	153	539	4.5	24.0
" 24	4	h	"	20.0	150	160	503	2.0	20.4
" 25	425	j	"	20.0	173	124	329	5.0	25.4
" 26	5	k	"	18.8	194	725	79	2.0	21.4
" 27	6	l	"	<u>16.3</u>	<u>169</u>	<u>279</u>	<u>230</u>	<u>2.5</u>	<u>19.7</u>
Total, June:				95.4	847	1441	1280	15.8	110.9
Oct. 12	6	m	"	4.6	50	58	71	1.5	6.7
Total for sheet:				193.3	1700	2569	2621	51.5	225.9

2621
5190

Smooth hydrographic field sheet
No. 5, and the accompanying records have been examined and are
approved.

A handwritten signature in cursive script that reads "Jack Senior". The signature is written in dark ink and is positioned above the typed name and title.

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

200

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

✓ Division of Charts: Att: Mr. E. P. Ellis

Tide Reducers are approved in
6 volumes of sounding records for

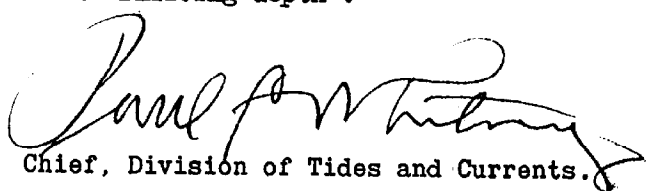
HYDROGRAPHIC SHEET 5931

Locality South end Colvos Passage, Puget Sound, Washington.

Chief of Party: Jack Senior in 1935
Plane of reference is mean lower low water reading
2.6 ft. on tide staff at Quartermaster Harbor
11.2 ft. below B.M.1 (1935)
4.1 ft. on tide staff at Gig Harbor
10.3 ft. below B. M. 1 (1935)

Height of mean high water above plane of reference is 10.9 feet at
Quartermaster Harbor and 11.1 feet at Gig Harbor.

Condition of records satisfactory except as noted below:
It would appear that the depth unit was changed sometimes unnecessarily and
contrary to that portion of Par. 133 of the Hydrographic Manual, page 16,
which reads as follows: "In cases where the depths fluctuate above and below
the depth at which the unit is changed, the smaller unit shall be used until
the depths are uniformly greater than the limiting depth".


Chief, Division of Tides and Currents.

GEOGRAPHIC NAMES
Survey No. **H5931**

Name on Survey	<div style="display: flex; justify-content: space-between; font-size: small;"> On Chart No. On previous survey No. On U. S. quadrangle Maps From local MILITARY information GEOG. Survey Maps P. O. Guide or Map Rand McNally Atlas U. S. Light List MARINEWAYS NAMES </div>										
	A	B	C	D	E	F	G	H	K		
<u>COLVOS PASSAGE</u> ✓	6460	COLVOS ON 1452		✓	✓		✓		✓	1	
<u>VASHON I.</u> ✓	6460	VASHON ON 1671/1452	✓	✓	✓		✓		✓	2	
PT. SOUTHWORTH	6460									3	
PT. VASHON	6460									4	
<u>PT. SANDFORD</u> ✓	6460	SANDFORD ON 1452		✓	PT. SANDFORD				✓	5	
<u>CAMP SEALTH</u>	6460						✓			6	
<u>SPRING BEACH</u>	6460	1452					✓		✓	7	
<u>PT. DALCO</u> ✓	6460			PT. DALCO	DALCO POINT				PT. DALCO	8	
<u>DALCO PASSAGE</u> ✓	6460			✓	✓				✓	9	
<u>TACOMA</u>	6460		TACOMA	✓	✓	✓			✓	10	
<u>THE NARROWS</u> ✓	6460	1671		✓	✓				✓	11	
<u>GIG HARBOR (TOWN)</u>	6460	#		✓	✓	✓	✓		✓	12	
<u>GIG HARBOR</u> ✓	6460	1671		✓	✓				✓	13	
<u>PT. RICHMOND</u>	6460			✓	✓				✓	14	
<u>PT. DEFIANCE</u>	6460	1671 1452 2263		✓	✓		✓		✓	15	
										16	
										17	
Names approved Jan. 16 1936										18	
O'Keefe										19	
										20	
										21	
										22	
										23	
										24	
										25	
										26	
										27	

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H5931**

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

Number of positions on sheet	170.0
Number of positions checked	abt 3%
Number of positions revised	...9..
Number of soundings recorded	519.0
Number of soundings revised	...50
Number of signals erroneously plotted or transferred	None

Date:

Verification by John G. Ladd

Time: 7 days 5 hrs.

Review by

R. J. Christman

Time: 10 1/2 hrs

MEMORANDUM

IMMEDIATE ATTENTION

~~SURVEY~~
 DESCRIPTIVE REPORT } No. H 5931
~~PHOTOSTAT # OF~~ } ~~No. H~~

{ received Jan. 2, 1936
 registered Jan. 11, 1936
 verified
 reviewed
 approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25		<i>ewp</i>	
26			
30			
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	
----	--

C. K. Green

Jan 14, '36

Verification Report

H-5931

1. The records are neat and legible and conform to the requirements of the manual with the following exception:
 - a. numerous bottom characteristics are recorded as "S and nk". Since there is no authorized symbol for "nk" it was assumed that "nk" was intended and they were so inked on the smooth sheet.
 - b. Page 69, Vol 5, Aug 15, (location of wrecked barge) should have had a day letter assigned to it so that it could have been shown on the smooth sheet when the position was plotted so that future identification of the position would be possible.

Shoeline & Signals

2. The top signals and shoeline
 6439 (1935), T-6440 (1935) ✓
 originate with T-~~6441~~ (1935) - T-~~6442~~⁴ (1935)
 and T-6445 (1935).

3. Junction with contemporary surveys.

Junctions are made
 With: H-5930 (1935) on the north,
 with H-6102 (1935) on the south and with
 H-5932 (1935) on the east. ✓

They have not been applied since &
 this date they have not been
 verified and added.

4. The first platting was excellent. ✓

John S. Reed

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5931 (1935) FIELD NO. 5

South End Colvos Passage, Puget Sound, Washington
Surveyed in April, May, June, October, 1935
Instructions dated March 29, 1934 (EXPLORER)

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - Jack Senior.
Surveyed by - W. Weidlich.
Protracted by - W. Weidlich, H. H. Hardy.
Soundings penciled by - W. Weidlich.
Verified and inked by - John G. Ladd.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

The Division of Tides and Currents notes that the depth unit of tide reducers was changed sometimes unnecessarily and quotes from par. 133 of the Manual "In cases where the depths fluctuate above and below the depth at which the unit is changed, the smaller unit shall be used until the depths are uniformly greater than the limiting depth".

The Descriptive Report is complete and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The plan, character and extent of development are in accordance with the instructions for the project.

3. Shoreline and Signals.

The shoreline and signals originate with plane table surveys T-6439 (1935), T-6440 (1935), T-6444 (1935) and T-6445 (1935).

The 11 hydrographic signals were located by sextant cuts recorded in the sounding records. (See List of signals, page 1 Vol. 1 for index of cuts).

4. Sounding Line Crossings.

No cross lines were run except in the entrance to Gig Harbor. Soundings in general are consistent.

5. Depth Curves.

Within the area covered by the survey, the usual depth curves may be satisfactorily drawn.

6. Junction with Contemporary Surveys.

- a. The junctions with H-5930 (1935) to the north and with H-5932 (1935) to the east are satisfactory.
- b. The junction with H-6102 (1935) to the south will be considered in the review of that sheet.

7. Comparison with Prior Surveys.

a. H-1426a (1878).

This survey on a scale of 1:20,000 embraces the entire area of the present survey. In the deeper area, only a few soundings are shown but the general agreement in depth is good. The sunken rock charted in lat. 47°17.18', long. 122°32.78' just north of Evans Point light, was not found during the present survey, the line of soundings passing to the northward of its assigned position during an 8 foot stage of tide. The Superintendent of Lighthouses, 17th District, reported under date of May 6, 1930 (Chart Letter 252, 1930) "A search was made of Evans Rock - - - the water was found to deepen quickly out from the low water mark and in and around the charted position of this rock, and its existence is at least very doubtful." On receipt of this report, a study was made of all the evidence available (see Memo. attached to Chart Letter 252, 1930) and it was decided to retain the rock on the chart.

Evans Rock considered disproved. For discussion, see Rev. (par. B-13) of A. W. K. (1936) attached to D.R. of H-5710. H.W.M. 2/5/37

The Descriptive Report of T-6445 (1935) states "The rock, just north of Evans Point Light, on the chart, shown by a simple cross above the low water line, is believed to be non-existing. The beach was examined at minus tide and no rock was visible. There is no local knowledge of its existence." However, in view of the definiteness of the original information, this statement is not considered sufficient to disprove its present existence and it has been carried forward to H-5931 (1935) as a "1/2 fathom Rk" in a position that takes into account the descriptive notes relative thereto in the original sounding record.

Because of the larger scale and closer development of the present survey, H-5931 (1935) with indicated addition of the sunken rock, should supersede the above survey for charting purposes.

b. H-2251 (1892), H-4752 (1928).

These surveys on scale of 1:10,000 show the inshore hydrography on the northeast coast of Pt. Defiance, southwest side of Dalco Passage. The agreement with the present survey is adequate and the above surveys should be superseded by H-5931 (1935) for future charting purposes.

8. Comparison with Chart 6460 (New Print dated Sept. 24, 1935).

a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs and contains no other information that needs consideration in this review.

b. Aids to Navigation

Lights located by triangulation are the only aids to navigation within the area of the survey under consideration. Their charted positions are in agreement with the positions given on H-5931 (1935).

9. Field Plotting.

The field plotting was excellent.

10. Additional Field Work Recommended.

The survey is very satisfactory and no further work is required.

11. Superseding Old Surveys.

Within the area covered, the present survey with indicated addition supersedes the following surveys for charting purposes:

H-1426a	(1878)	in part
H-2251	(1892)	" "
H-4752	(1928)	" "

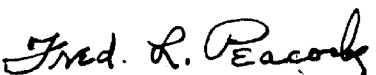
12. Reviewed by - R. J. Christman, July 15, 1936.

Inspected by - A. L. Shalowitz.

Examined and approved:


C. K. Green,
Chief, Section of Field Records.


L. O. Robert,
Chief, Division of Charts.


Fred. R. Bacon,
Chief, Section of Field Work.


G. H. Hude,
Chief, Division of H. & T.

Applied to Cht. 6407 Sept. 8, 1937. K.R.
" " " 6460 May 4, 1938 K.R.

25 Jan 17, 1936
L.R.

5932

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
JAN 2 1936
Acc. No. _____

5932

(And Addl. Wk. 1936,
For which See 5710,
Addl. Wk. 1936 D.R.)

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, Director

State: WASHINGTON

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 6.
Hydrographic }

LOCALITY

QUARTERMASTER HARBOR, & Vic.

~~DAICO PASSAGE and~~

~~NORTH TACOMA WATERFRONT~~

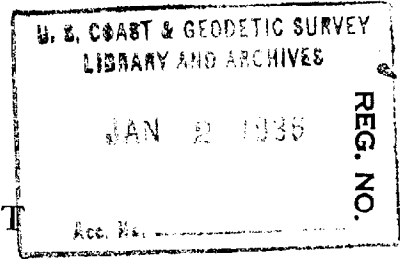
PUGET SOUND

1935.

CHIEF OF PARTY

Jack Senior

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY



HYDROGRAPHIC TITLE SHEET

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. 6

REGISTER NO. **H5932**

State Washington

General locality Puget Sound

Locality Quartermaster Harbor, ^{Vicinity} ~~Dalco Passage & N. Tacoma Waterfront.~~

Scale 1:10,000 Date of survey May-June-Oct.-Nov., 1923

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by W. Weidlich & H. H. Hardy

Soundings penciled by W. Weidlich

Soundings in fathoms ~~feet~~ and fractions thereof.

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by *[Signature]*

Verified by *[Signature]*

Instructions dated March 29, 1934.

Remarks: _____

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 6

QUARTERMASTER HARBOR, DALCO PASSAGE and

NORTH TACOMA WATERFRONT

PUGET SOUND - WASHINGTON

1935

AUTHORITY:

The hydrography on this sheet was executed under instructions of the Director of the U. S. Coast and Geodetic Survey, dated March 29, 1934.

SCALE:

The scale is 1:10,000 and soundings are in fathoms and fractions thereof.

LIMITS:

This survey covers the entire area of Quartermaster Harbor and extends to the south limits of the sheet. At the east limit it connects and overlaps with sheet No. 3 (1:10,000) at a line drawn between signals "Yet" and triangulation station "Dash". At the western limit at Longitude 122° 31', connects with sheet No. 5.

METHODS:

The approved methods of the service were used throughout.

All launch work performed with good fixes, generally on ranges which explains the lack of compass headings in the sounding volumes. The launch "Delta" was used for all the work and the letter days are shown in red.

A ten pound handlead was used in depths of less than 15 fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire. All soundings are up and down casts.

The lines in Quartermaster Harbor run east and west and are spaced about 100 meters apart. They are spaced much closer near the wharves of Burton, Dockton and south of the point east of Burton. Cross lines were run on the long shoals and are spaced very closely. Numerous splits were run at the west shore of the harbor in order to check the depths shown on chart No. 6480.

South of Quartermaster Harbor all lines run north and south, spaced 200 meters apart in the deep water with splits between near the shores. Near Neill Point, Dash Point and Brown Point the lines run much closer.

On account of the strong current off Brown Point Light the lines were not run normal to the shore and therefore, spaced as close as possible.

Changes had to be made in the records and positions had to be re-plotted on account of an error in fixes. On November 5th, while working in the vicinity of triangulation station "Bluff", Mr. Garber, who took left angle, called my attention to the error. A large chimney was taken for signal "Sta", which in fact was signal "Black". There is no such signal on the topographic sheet and I am not able to explain how I came to transfer it to the boat sheet. The changes shifted the positions slightly north corresponding with other soundings.

LOW WATER LINE:

The low water line was determined by the lead in practically all cases with the exception of the northernmost area near station "Tag", where the work was discontinued on account of very squally weather.

Lower water and minus tides prevented the approach to the low water in vicinity of Dash Point. The launch grounded at position 107 "n". The distance off the low water line was recorded when ever a change in direction was made in order to avoid grounding.

TIDES:

A portable automatic tidegauge was in operation at the dock at Burton, Quartermaster Harbor, and all reducers were taken from its records covering the period during which the soundings were taken, with the following exception:- for "r", "s" and "t" days. These exceptions were also referred to tidal plane determined for Quartermaster Harbor by correcting hourly heights at Seattle by factors determined from simultaneous observations.

CONTROL:

Triangulation and topography furnish the necessary control.

KELP:

Little or no kelp was found, except in the immediate vicinity of Neill Point and the south shore of Vashon Island.

RESULTS AND COMPARISON:

On account of the scarcity of soundings on chart No. 6460 and not having a photostat copy of previous surveys on hand, a fair comparison can not be made; neither does this survey reveal anything which may be considered a menace to navigation. ✓

On the west shore of Quartermaster Harbor, this survey failed to reduce the depths as shown on chart No. 6460, in fact it increases the depth by 1 to 2 feet. ✓

It is assumed that the plane of reference in the older surveys was ^{3.7 ft.} 2 feet below M.L.L.W.; the same as adopted in the survey of 1915, in Eagle Harbor, Sheet No. 4, 1934. ✓

CHARACTERISTICS OF BOTTOM AND SHORELINE:

The bottom is generally muddy in deeper water; sand, gravel and small boulders near the shores. ✓

The south shore of Maury Island, in the vicinity of the long pier is studded with numerous small boulders; otherwise, the beach is sandy. ✓

^{At} The head of Quartermaster Harbor, south of triangulation station "Pin", the beach is rocky. Two prominent rocks located by topography, lie about 100 meters west and southwest from triangulation station "Sleet". ✓

Extensive sandflats are in the vicinity of Burton, a summer resort at the north shore. The east shore is littered with driftwood and large roots. ✓

There are several boulders north of Neill Point and the positions correspond with those shown on chart No. 6460. ✓

Extensive sandflats are in the vicinity of Dash Point and extend for about one-half mile in a southerly direction where the gravel beaches begin. ✓

The southwest point, near station "Dron", at the east entrance to Commencement Bay is rocky near the low water line. ✓

The west shore of Commencement Bay covered by this survey, as a rule is sandy, with occasional small boulders near the low water line.

The bottom in the land-locked area of the Tacoma Yacht Club as a rule is sandy, near the shore, very foul, studded with small boulders and littered with old wooden and broken off cement piling and large roots. The old cement piling will be found between a small landing pier and the ferry slip.

The breakwater is constructed of slag obtained from the world's largest smelter, and is subject to changes in the near future. It is the intention to extend the end in a southerly direction in order to protect the yacht club from strong southwesterly winds, which are reported to blow home with considerable force and cause a considerable amount of damage to the small yachts.

DANGERS AND OBSTRUCTIONS:

This area is free of dangers with the exception of the west entrance to Quartermaster Harbor and along the west shore.

No. 1 A shoal with a least depth found of 4-2/6 fathoms at M.L.L.W., lies about 700 meters, 279° true from signal "Nose". Chart No. 6460 shows a depth of 4-3/4 fathoms. Positions 72 - 73 "c".

No. 2 A shoal area with a least depth found of 2-4/6 fathoms at M.L.L.W., lies about 240 meters, 103° from triangulation station "Sun". Sandy, muddy and rocky bottom. Positions 162 - 163 "b" and sounding lines, positions 87 to 92 "c". Chart No. 6460 shows a depth of 2 fathoms.

No. 3 A shoal area with a least depth found of 2-1/2 fathoms at M.L.L.W., lies about 310 meters, 92° from triangulation station "Rain", position 58 "1". Another 2-1/2 fathoms spot lies about 280 meters, 79° from station "Rain", position 54 "1". Bottom is sandy and muddy.

A 2-4/6 fathoms spot lies about 350 meters, 83° from station "Rain", muddy bottom, positions 4-5 "f".

No. 4 A 4-1/2 fathoms spot lies about 440 meters, 120° from station "Rain". Positions 14 to 16 "f". This area is not developed.

No. 5 A shoal with a least depth found of $3\frac{1}{4}$ fathoms at M.L.L.W., lies about 350 meters, 75° from triangulation station "Hard". Positions 38, 39 and 40 "1". Sandy bottom. Chart No. 6460 shows a depth of $3\frac{1}{4}$ fathoms in this locality.

No. 6 A shoal about 500 meters long and 100 meters wide, west of triangulation station "Manzanita". Least depth found, $4\frac{2}{6}$ fathoms at M.L.L.W., and lies about 270 meters, 279° from station "Manzanita". Bottom is sandy. Positions 70-71, 74-75 and 80-81 "1". This shoal runs in a north-northwest and south-southeast direction. At the southern end of this shoal is a $4\frac{4}{6}$ fathoms sounding and bottom drops off into much deeper water. This $4\frac{4}{6}$ fathoms sounding lies about 360 meters, 209° from station "Manzanita". Positions 68 and 69 "1". Hard bottom. Least depth shown on chart No. 6460 is $4\frac{1}{4}$ fathoms.

No. 7 A red buoy lies about 320 meters west of station "Anita" in a depth of $4\frac{2}{6}$ fathoms and marks the extreme end of a shoal area extending from Mauri Island. Pos. 84 L

Pacific Coast Pilot, page 244, "Quartermaster Harbor", paragraph 2, states: "Buoy placed in 8 fathoms".

No. 8 A $2\frac{4}{6}$ fathoms spot lies about 305 meters, 34° from triangulation station "Work", position 20 "1", sandy bottom.

No. 9 A shoal with a least depth found of $2\frac{1}{6}$ fathoms at M.L.L.W., lies 320 meters, 84° from station "Work". Positions 28-29 "g" and 90-91 "g". Sandy bottom. Chart No. 6460 gives a depth of 2 fathoms in this locality.

No. 10 A kelp patch, with a least depth of $1\frac{1}{6}$ fathoms at M.L.L.W.; at the northern end of the patch, lies about 170 meters, 119° from station "Martin". Rocky bottom. Position 94 "1". This area is well developed, expecting to find even less water. Bottom was not visible even at that depth.

No. 11 A $2\frac{1}{2}$ fathom spot lies about 310 meters, 125° from station "Martin". Position 35 "k". Bottom is rocky and sandy and very irregular in this vicinity.

No. 12 ✓ Position of a small boulder which ✓
bares 1 foot at M.L.L.W., lies about 60 meters, 135° from station ✓
"Martin". Position 97 "h". ✓

No. 13 ✓ A rock which bares about 6 feet at ✓
M.L.L.W., lies about 130 meters, 27½° from signal "Wed". This ✓
rock was passed within 3 meters on starboard hand and the depth ✓
was estimated. Positions 123-124 "j". ✓

No. 14 ✓ A sand spit extends for about 130 ✓
meters in a northwest direction from Dash Point. On account of ✓
the minus and low tides, the spit was approached as close as ✓
possible. Grounded at the spit at position 107 "n". ✓

The low water line south of the ✓
point was also approached as close as possible with estimated ✓
distance. ✓

ANCHORAGES:

Quartermaster Harbor affords ex- ✓
cellent shelter in any kind of weather, about 500 meters north- ✓
east from Dockton Wharf in about 6 fathoms of water, muddy ✓
bottom. ✓

This anchorage was used by the Str. ✓
EXPLORER during a 65 mile an hour gale, October 21, 1934, and ✓
for several weeks while the survey took place in adjacent waters. ✓

The anchorage is easily approached ✓
by using midchannel courses after rounding the red buoy. ✓

WEATHER:

Although the weather was very hazy ✓
and large forest fires interfered with the visibility a great ✓
deal, the weather as a rule was pleasant, with little or no ✓
wind, except on "e" day, and the sea was smooth and calm most ✓
of the time. ✓

Respectfully submitted,

W. Weidlich
W. Weidlich,
Mate, C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

Approved and forwarded,

Jack Senior
Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

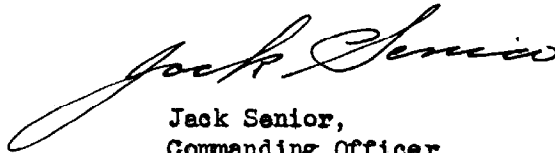
STATISTICS

HYDROGRAPHIC SHEET NO. 6

1935

DATE	VOL.	DAY	BOAT	STAT. MILES	POS.	HAND-MACH. SOUNDINGS	TO & FROM WK.	TOTAL DIST. RUN
May 15	1	a	Delta	224	171	922 ---	1.0	21.5
June 4	1&2	b	"	19.2	178	925 ---	1.0	19.7
" 5	2	c	"	15.3	184	1008 ---	1.6	16.9
" 6	2&3	d	"	8.2	97	584 ---	3.0	12.2
" 7	3	e	"	17.5	129	602 97	3.0	25.7
" 8	3&4	f	"	21.7	148	421 137	2.0	22.9
" 9	4	g	"	19.3	117	307 137	7.0	26.8
" 10	4	h	"	24.8	119	124 242	4.0	28.6
" 12	5	j	"	17.8	131	314 156	3.0	20.5
" 17	5	k	"	5.0	79	248 19	2.0	8.4
" 18	5&6	l	"	17.8	155	301 119	3.0	22.5
" 19	6	m	"	7.0	32	--- 71	4.0	12.1
" 20	6	n	"	17.7	159	323 197	5.0	23.4
" 21	6	p	"	9.5	83	87 134	4.0	14.3
" 22	7	q	"	<u>17.5</u>	<u>146</u>	<u>193 249</u>	<u>3.3</u>	<u>22.5</u>
Total; June:				218.5	1757	5437 1558	45.9	276.5
Oct. 11	7	r	"	8.6	86	117 133	2.0	11.5
" 12	7	s	"	<u>---</u>	<u>6</u>	<u>28 ---</u>	<u>---</u>	<u>---</u>
Total; October;				8.6	92	145 133	2.0	11.5
Nov. 5	7	t	"	6.8	85	205 70	1.0	6.9
Total For Sheet:				256.3	2105	6709 1761	49.9	316.4

Smooth hydrographic sheet, field
No. 6, and the accompanying records have been examined and are
approved.

A handwritten signature in cursive script, reading "Jack Senior". The signature is written in dark ink and is positioned to the left of the typed name and title.

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

TIDE NOTE FOR HYDROGRAPHIC SHEET

May 29, 1936.

Division of Hydrography and Topography:

✓ Division of Charts: Att: Mr. E. P. Ellis

Tide Reducers are approved in
7 volumes of sounding records for

HYDROGRAPHIC SHEET 5932

Locality Quartermaster Harbor and Vicinity, Washington.

Chief of Party: Jack Senior in 1935.
Plane of reference is mean lower low water reading
2.6 ft. on tide staff at Quartermaster Harbor
11.2 ft. below B.M. 1 (1935)

Height of mean high water above plane of reference is 10.9 feet.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

GEOGRAPHIC NAMES
Survey No. **H5932**

Name on Survey	Source of Name										
	A	B	C	D	E	F	G	H	K	MEMORANDUM NAMES	
	On Chart No.	On previous survey No.	On U. S. quadrangle Maps	From local information	On local Maps	P. O. Guide or Map	Rand McNally Atlas	Geog. Dict. U. S. Light List			
<u>QUARTERMASTER HARBOR</u>	6460							✓	✓	1	
<u>DOCK TON</u>	6460							✓	✓	2	
<u>MANZANITA</u>	6460							✓	—	3	
<u>ROSEHILLA</u>	6460			✓					—	4	
<u>PT. PINER</u> ✓	6460						PINER PT.		✓	5	
<u>COMMENCEMENT BAY</u> ✓	6460							✓	✓	6	
<u>DALCO PASSAGE</u> ✓	6460							✓	✓	7	
<u>NEILL PT.</u> ✓	6460							✓	✓	8	
<u>PT. DALCO</u> ✓	6460						DALCO PT.		✓	9	
<u>MAGNOLIA BEACH</u>	6460							✓		10	
<u>BURTON</u>	6460							✓	✓	11	
<u>PORTAGE</u>	6460							✓	—	12	
										13	
<i>Names approved Jan. 18 1936.</i>										14	
<i>[Signature]</i>										15	
										16	
										17	
										18	
										19	
										20	
										21	
										22	
										23	
										24	
										25	
										26	
										27	

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H5932**

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

Number of positions on sheet	2105
Number of positions checked	45
Number of positions revised	6
Number of soundings recorded	8470
Number of soundings revised	15
Number of signals erroneously plotted or transferred	0

Date: *July 8, 1936*

Verification by *[Signature]*

Review by

John G. Ladd

Time: *60 1/2 hours*

Time: *16 "*

HYDROGRAPHIC SURVEY NO. H5932

Smooth Sheet yes

Boat Sheet 1

Sounding Records 7 Vols. _____

Descriptive Report yes

Title Sheet yes

List of Signals Vol. 1

Landmarks for Charts (Form 567) none

Statistics yes

Approved by Chief of Party yes

Recoverable Station Cards (Form 524) none

Special Chart for Lighthouse Service no
(Circular Nov. 30, 1933)

Remarks _____

MEMORANDUM

IMMEDIATE ATTENTION

~~SURVEY~~
 DESCRIPTIVE REPORT } No. H 5932
~~PHOTOSTAT OF~~ } ~~NOT~~

{ received Jan. 2, 1936
 { registered Jan. 11, 1936
 { verified
 { reviewed
 { approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25		<i>LuB</i>	
26			
30			
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	
----	--

G. K. Green *Jan 15-36*

Section of Field Records
Hydrographic Survey 5932 (1935), Field No. 6

Quartermaster Harbor and Vicinity, Puget Sound,
Washington
Chief of Party - Jack Senior

1. Condition of Records

In general the records conform to the requirements of the Hydrographic Manual.

- (a) There are several signals outside of the highwater line which do not show the topographic feature, these are either on piles or on boulders close in shore. Signal "Sip" (Lat. $47^{\circ} 23.55'$ Long. $122^{\circ} 27.6'$) is about 60 meters outside of the highwater line, it is probably on a pile or on the ruins of an old dock. ✓
- (b) Near position 57d page 6 Vol. 3 is recorded the following note "ran over old sunken pilings" (stage of tide 7-1/2 feet). These do not appear on T-6441 (1935) although at the edge of the low water line. Since the character and location of these piling was not ascertained by the topographic party, and since they are at or near the low water line, it is recommended that the note "foul area" be used on the smooth sheet. *area marked "Foul area"* ✓
- (c) Positions 37 and 38q are questioned by the chief of party. The soundings involved have been plotted according to the records. It is believed that the adjoining survey may, when available, overlap enough to more completely delineate the bottom and possibly prove or disprove the above mentioned positions. *Pos. of 37q improved by replottings should be accepted unless later disproved by adjoining survey J.G.L.*
- (d) The 39 fathom sounding at position 103 on page 42 Vol. 6 is marked "doubtful" by W. Weidlich. This sounding is probably out of position because Signal "So" (the left object of the fix) falls outside of the limits of the boat sheet, therefore making it difficult to plot accurately thereon. It is stated on page 38 Vol. 6 that the identity of signal "So" was not known at the time of this survey and that it was transferred from field sheet No. 3 (H-6101 - 1935). In view of the above the undersigned has not inked the 39 fathom sounding on position 103n. *39 fath at Pos. 103n not plotted J.G.L.*

2. Shoreline and Control.

The shoreline and signals originate with T-6440 (1935), T-6441 (1935), T-6444 (1935) and T-6445 (1935). ✓

4. Depth Curves.

The usual depth curves can be satisfactorily drawn. The low water curve, in places where the soundings do not completely delineate it, was not taken from the topographic surveys and shown by a black dotted line on the smooth sheet by the undersigned because the low water line on the topographic surveys was sketched from the hydrographic information (See Descriptive Report T-6441 (1935)). Therefore the yellow or yellow dashed line has been used to denote the low water line throughout the limits of the sheet. ✓

5. Aids to Navigation.

The channel buoy in Lat. $47^{\circ}20.95'$ Long. $122^{\circ}28.66'$ is located by sextant 3 point fix - position 841 page 65, Vol. 5. It is described as a red channel buoy on page 63 of Vol. 3. This buoy does not appear on T-6441 (1935). ✓

6. Junctions with Contemporary Surveys.

This survey makes a satisfactory junction in Dalco Passage with H-5931 (1935). The junction with H-6101 (1935) on the northeast will be considered when that sheet is verified. When the survey of Commencement Bay is received the junction with it will be considered. ✓

7. Field Plotting.

The field plotting should have been more carefully executed. Soundings were not penciled on the smooth sheet between positions 73 and 77k inclusive, and several positions were revised. ✓

8. Remarks.

The former U.S.C. & G.S.S. *Gedney* is tied up at the dock in Lat. $47^{\circ}22.43'$ Long. $122^{\circ}27.56'$. It is shown on the boat sheet but was not transferred to the smooth sheet. ✓

Verified and inked by



Leo S. Straw

July 8, 1936

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5932 (1935) FIELD NO. 6

Quartermaster Harbor and Vicinity, Puget Sound, Washington.

Surveyed in 1935

Instructions dated March 29, 1934.

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - Jack Senior.

Surveyed by - W. Weidlich.

Protracted by - W. Weidlich and H. H. Hardy.

Soundings penciled by - W. Weidlich.

Verified and inked by - Leo S. Straw.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. A number of triangulation stations and topographic signals plot outside the high water line for which no topographic feature is shown. However, they all (except signal "Sip") are within the low water line and are considered to be on boulders, etc. Signal "Sip" is only about 20 meters outside the low water line and in very shoal water. It is likely on a pile.

The Descriptive Report is complete and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The survey satisfactorily complies with the instructions for the project, except that the 4-1/2 fathom shoal in lat. 47°21.4', long. 122°28.9', should have been developed.

Developed.
See note,
par. 10, this
review.
H.W.M. 1/25/37

3. Shoreline and Signals.

The shoreline and topographic signals originate with T-6440 (1935), T-6441 (1935), T-6444 (1935) and T-6445 (1935).

4. Sounding Line Crossings.

No regular system of cross line was run, however, those that occur in the normal development of the work, together with the parallel adjacent lines are in good agreement.

5. Depth Curves.

The usual depth curves may be satisfactorily drawn including most of the low water curve.

6. Junctions with Contemporary Surveys.

The junction with H-5931 (1935) on the west is satisfactory. The junction with H-6101 (1935) on the east and with the survey on the south will be considered in the reviews of those surveys.

7. Comparison with Prior Surveys.

a. H-1381 (1877).

This survey on a 1:10,000 scale overlaps the present survey on the south. A comparison between the two surveys reveals no differences of any importance, except as follows:

- (1) The 17, 15 and two 9 fathom soundings shown on H-1381 (1871), at lat. $47^{\circ}17.95'$, long. $122^{\circ}26.65'$, fall on the present survey in depths 11 to 17 fathoms deeper. A replotting of pos. 21W (H-1381) which controls these four soundings, places the position about 70 meters shoreward, at which point the soundings are in reasonable agreement with the present survey. The 17, 15 and two 9 fathom soundings should, therefore, be disregarded in future charting.

b. H-1426a (1878).

This survey on a 1:20,000 scale contains relatively few soundings that come within the limits of the present survey. It contains no soundings that are in conflict except the inshore soundings along the southern shore of Dalco Passage (in the southwest portion of the sheet). However, the present survey shows that this area has been built out and extensive construction along the waterfront has taken place, such as docks, bulkheads, piers, etc. Consequently, a comparison would serve no useful navigational purpose and is omitted. H-1426a (1878) should be superseded by the present survey for future charting.

c. H-1425b (1877-78).

This survey on a 1:10,000 scale covers the entire area of Quartermaster Harbor. It contains no soundings that are in conflict with the present survey with the exception of a few differences of 1 to 3 feet in depths of 30 to 40 feet. They are not of sufficient importance, in view of the more adequate

development on the present survey to warrant further consideration. H-1425b (1877-78) should be superseded by the present survey for charting purposes.

d. H-2251 (1892) and H-2986 (1909).

These two surveys both on scales of 1:10,000 contain inshore soundings only. They are along the shore of Commencement Bay and overlap the present survey along the southern part of the sheet. A comparison between them and the present survey reveals no differences of importance, except along the southern shore in the vicinity of lat. 47°18', longitude 122°30', where numerous artificial changes have taken place. The above surveys should be superseded by the present survey in future charting.

e. H-4752 (1928).

This survey on a 1:10,000 scale contains a relatively few inshore soundings only. It overlaps the present survey along the southern shore, and contains no soundings that are in conflict with the present survey and should be superseded by it in future charting.

8. Comparison with Chart No. 6407 and 6460 (New Print dates May 4, 1935 and September 9, 1935).

The charts are based on surveys discussed in the foregoing paragraphs and contains no additional information that needs consideration in this review.

9. Field Plotting.

The field plotting was reasonably satisfactory.

10. Additional Field Work Recommended.

The survey is complete except for a development of the 4-1/2 fathom shoal in lat. 47°21.4', long. 122°28.9'.

11. Superseding Old Surveys.

Within its limits the present survey supersedes the following surveys for charting purposes:

H-1381 (1877) in part
H-1425h (1877-8) entirely
H-1426a (1878) in part


Developed. See
Rev. (1937) (12)
of Add'l Wk.
(1936) attached
to D.R. of H-5710
H.W.M. 1/25/37

H-2251 (1892) in part
H-2986 (1909) " "
H-4752 (1928) " "


12. Reviewed by - John G. Ladd, July 23, 1936.


Inspected by - A. L. Shalowitz.

Examined and approved:


C. K. Green,
Chief, Section of Field Records.


Chief, Division of Charts.


Chief, Section of Field Work.


Chief, Division of H. & T.

Applied to Cht. 6407 Aug. 19, 1937 K.P.
" " 6460 May 11, 1938 K.P.

25 Jan 16, 1936
LWS

Applied to chart 18474 Jan 12, 1904
Douglas C. Harper

6102

U. S. COAST & GEODETIC SURVEY
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Acc. No. _____

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

R. S. Patton, Director

State: Washington

DESCRIPTIVE REPORT

Topographic } Sheet No. 8. 6102
Hydrographic }

LOCALITY

~~The Narrows to Horseshed Bay~~

~~Puget Sound - Washington~~

Hale Passage

1935.

CHIEF OF PARTY

Jack Senior

6102

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

HYDROGRAPHIC TITLE SHEET

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. 8

REGISTER NO. **H6102**

State Washington

General locality Puget Sound

Locality ~~The Narrows to Horseshoe Bay~~ Hale Passage

Scale 1:10,000 Date of survey June - July, 1935.

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jask Senior

Surveyed by L. C. Wilder and W. Weidlich

Protracted by R. J. Sipe

Soundings penciled by R. J. Sipe

Soundings in fathoms ~~xxx~~

Plane of reference mean lower low water

Subdivision of wire dragged areas by ---

Inked by W. R. Jackson

Verified by W. R. Jackson

Instructions dated March 29, 1934.

Remarks: -----

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 8,
THE NARROWS TO HORSEHEAD BAY
PUGET SOUND - WASHINGTON

AUTHORITY:

This survey was made under Instructions to the Commanding Officer, Ship EXPLORER, dated March 29, 1934.

LIMITS:

It covers the hydrography from Evans Point Lighthouse, in "The Narrows" through Hale Passage and Whollocket Bay to and including Horsehead Bay.

OFFICERS IN CHARGE:

The survey was made by L. C. Wilder and party in Tender No. 1, except Horsehead Bay and also every other line, along shore, between this bay and the north entrance to Hale Passage which was accomplished by W. Weidlich and party in the Launch Delta.

SCALE:

The scale of the survey is 1:10,000.

CONTROL:

Standard control of three point fixes on triangulation stations and topographic signals located on a scale of 1:10,000, were used.

METHODS:

Usual survey methods for hydrography were used, three point fixes, ten pound hand lead in fifteen fathoms and less, machine and eighteen pound lead in greater depths. As far as possible changes in speed were made only on positions.

The lead stand is in the forward end of and the angle men and sounding machine in the after end of this thirty foot launch (Tender No. 1).

Currents in "The Narrows" were exceptionally strong. When sounding with machine here care was taken to run back on the natural range, after a machine sounding, on the same course, each time. Time was taken ahead as soon as the launch was on the range. This

assured correct spacing of soundings.

GENERAL CHARACTERISTICS OF THE SHORELINE AND BOTTOM:

The shore line between the high and low water lines is sand or gravel or both and scattered boulders in many places, except in the north half of Whollochot Bay, Day Island Lagoon, and the small inlet on the northeast shore of Fox Island in Longitude 122°36' where the shore lines are mud. The shore line in Horsehead Bay is mostly mud with sand in a number of places.

The bottom outside the low water line in "The Narrows" to Day Island is hard. Probably a hard clay in places, boulders in other places and possibly ledge. It is swept clean by strong currents. A specimen cup was used but no samples brought up.

In Hale Passage the bottom is sand, gravel near the beaches and mud in some of the bights and small bays. The bottom in Whollochot Bay is mud and also in Horsehead Bay.

DANGERS, OBSTRUCTIONS AND SHOALS:

The shore line of the entire area of this sheet was searched at low water for off-lying rocks or dangers.

There are but four spots on this sheet which could be classed as dangers or obstructions.

1. Shoal in Latitude 47°14.8', Longitude 122°33.4', position 88 e, sand bottom, a least depth of 2-5/6 fathoms. Needs no further description.

2. Rock and shoal area on the west side of Whollochot Bay in Latitude 47°16.7', Longitude 122°35.8', bottom sand and scattered boulders. This was visited at dead low water and closely examined.

3. Shoal in Latitude 47°16.2', Longitude 122°38.3', sounding after position 167 p, least depth one fathom, marked by kelp, sandy bottom. A thorough search for least water was made. Bottom was visible - no boulders present.

4. Rock and shoal 300 meters east of triangulation station "ISLE". A small boulder bare one foot at mean lower low water is the highest point (located by cuts). This place was seen at a minus tide. It is strewn with boulders.

Lat. 47°16.45.
Long 122°38.7

In addition to these four shoals mention will be made of the following, no description is necessary; the low water line making out off topographic signal "JET", Day Island; also the low water

lines north of the long sand spit at the west side of the west entrance to Hale Passage and also at the east side of this entrance to the passage. Shoal water makes out well off the point at triangulation station "HALE" (careful examination made here).

There is a submerged concrete sewer pipe line on the east side of the channel into Day Island Lagoon (shown by blue dashed line).

changed to black in office

The grid for cleaning boats, shown in sketch near topographic signal "JAM" bares two feet at mean lower low water.

CHANNELS, AIDS AND RANGES:

There are no maintained ranges on this sheet. No natural ranges were selected by the hydrographer.

The only aid to navigation on this sheet is Evans Point Light, a flashing red light. Also Tower Light one mile to SE.

← *zero feet indicated by sdgs.*
About one foot of water at mean lower low water can be carried into Day Island Lagoon, east of Day Island. This Lagoon is used as an anchorage for small local boats and is of little value to other boatmen. There is only ^{one or two feet} ~~one~~ foot of water in the lagoon, south of the bridge. The clearance under this temporary wooden bridge was not measured but it is about ten feet at mean high water. The bridge bents are close together, about ten feet apart.

T-6446 (1935) states that the clearance is 20 ft. at MLLW at top of Nick. see letter of Jan. 29, 1937 in this Descriptive Report. 10 1/2 ft is good
There is one foot of water at mean lower low water through the entrance into the small lagoon on the northeast side of Fox Island in Longitude 122°36'. There is several feet more water in the lagoon, than through the entrance. Favor the east side (end of spit) in coming through the entrance. Keep to the middle, south of the entrance. ROE

The channel into Wholloch Bay is clear and requires no directions. A good anchorage in about ten fathoms, mud bottom is available in the middle, about due east of the shoal area and rock along the west shore. About six feet can be carried to within one half mile of the head of the Bay on mid-channel courses.

← *Maximum depth: 48'*
About forty-three feet can be carried through Hale Passage at mean lower low water. From the south follow the general trend of the north shore at a distance of 200-250 yards, to abeam the north end of Fox Island. The reef in Latitude 47°16.4', Longitude 122°38.8', is the principal danger in this passage. The two fathom curve extends out 150 yards off the point at triangulation station "HALE".

There are good anchorages for launches to the southeast, south and west of Grave Island. A one fathom spot is located 200 yards east of this island. The two fathom curve makes well out from the north end of this island.

Horsehead Bay is clear and requires no directions. This is a good anchorage for small vessels. There is swinging room for large vessels if anchored mid bay, and just inside the spit.

CURRENTS AND TIDE RIPS:

A current observation was made in "The Narrows" on June 5th, at 4:30 p.m., mid flood, positions 118 and 119 a, by allowing launch to drift, no wind, and 5-1/4 knots measured. This was at mid spring tide. Heavy tide rips are, of course, existant when winds are adverse to these strong currents. During the progress of the work on the sheet, the weather was mostly calm and the only place moderate or heavy tide rips were observed was in the eastern half of the narrow channel off Days Island. Anchorage in about Latitude 47°15' and Longitude 122°34'.

30

As far as is known tidal currents are normal except that it was deducted by sounding lines and boatmen that both the flood and ebb flow from west to east past the north end of Fox Island and into Hale Passage. It is believed, but was not observed, that tides meet at about Longitude 122°39' or to the east thereof. The flood sets northwest in Longitude 122°37' and the ebb is to the southeast. Currents are strong in Hale Passage but no measurements were made. It is believed that they attain at least four knots near the north end of Fox Island in Hale Passage.

DISCREPANCIES:

1. 100 meters west of topographic signal "ICE", a 2-5/6 sounding, position 71-72 c, outside a 5-1/6 sounding, position 123 c. ✓ corrected by respacing N.R.J.
2. 100 meters northwest of topographic signal "JACK" a 2-5/6 sounding outside a 3-5/6, 146-147 b. ✓ Lat. 47-15.2 Long. 122-33.1 spacing crowded, accepted N.R.J.
3. Between positions 136 - 137 ~~8~~, 100 meters east of triangulation station "SPIT", an 8-1/4 fathoms sounding plots outside of a 10-1/2 fathoms sounding. ✓ corrected by respacing 136g. N.R.J.

The above discrepancies can be accounted for only by errors in the spacing of soundings due to changes in the speed of launch in different currents.

Position 128 g, was moved to its proper position with respect to the ferry slip as it plots incorrectly. Signals used were across the bay at a considerable distance.

COMPARISON WITH EXISTING SURVEYS:

This comparison is made with Chart No. 6460, as photostats of hydrographic sheets are not available.

On the shoal spot in Days Island anchorage 2-5/6 fathoms was obtained on the present survey where 3-3/4 fathoms is shown on the chart. *Charted hydro from H-1426a (1878).*

The chart shows a rock off the west shore of Days Island within the low water line. This shoal was visited at low water. There are many small boulders on the shoal but none of enough importance to warrant locating. *Charted hydro. from H-1426a (1878). See Rev. par. 7a (1).*

There is more water around the southwest side of Grave Island than the chart shows. *Charted hydro. from H-1445a (1879).*

There is, at present, considerably more water into and in back of the spit on west side of the north entrance to Hale Passage than the chart shows. *Only a few soundings shown here on H-1445a (1879).*

LANDMARKS:

The following objects should be charted as landmarks:

Evans Point Light

Tacoma Light and Power Transmission Tower (triangulation station "TOWER LIGHT - 1935")

Belmarlow Sawmill Stack - 1924 (black mill stack)

Prominent house, 140 feet elevation, topographic station "HIGH", on topographic sheet.

Sawmill Stack (a topographic signal 100 meters northeast of triangulation station "WHOLLOCHET - 1935) see topographic sheet. *T-6460 (1935)*

GEOGRAPHIC NAMES:

"The Narrows", Hale Passage, Whollochett Bay, and Horsehead Bay are well established local as well as chart names.

The names Shaw Bay, the bight west of Arletta and Echo Bay, back of Grave Island were heard locally but were not further examined.

Respectfully submitted,

L. C. Wilder

L. C. Wilder,
H. & G. Engr., C. & G. Survey,
U.S.C. & G.S.S. EXPLORER.

APPROVED AND FORWARDED:

Jack Senior

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

TIDAL REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 8. H6102

Reducers were obtained from the Steilacoom gauge from "a" to "j" days, Tender No. 1, inclusive, and from "k" to "t" days inclusive, from the Arletta gauge. "a" to "c" days, Launch Delta, were from the Arletta gauge.

STEILACOOM, WASHINGTON

Lat. $47^{\circ}11'$, Long. $122^{\circ}36'$

Reference plane, mean lower low water	4.9 on staff ✓
Highest Tide, Sept. 15, 1935	20.0 on staff
Lowest Tide, July 16, 1935	1.4 on staff
*Ratio of ranges	1.223
*High water interval	5.11 hrs.
*Low water interval	11.48 hrs.

ARLETTA, WASHINGTON

Lat. $47^{\circ}17.2'$, Long. $122^{\circ}40'$

Reference plane, mean lower low water	4.0 on staff ✓
Highest Tide, August 17, 1935	18.8 on staff
Lowest Tide, July 16-17, 1935	1.0 on staff
*Ratio of ranges	1.217
*High water interval	5.17 hrs.
*Low water interval	11.54 hrs.

*Comparison with Seattle.

STATISTICS

Number of positions.....	3312
Number of soundings (handlead).....	7577
Number of soundings (machine).....	1755
Statute miles of sounding lines.....	290.0

LAC

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

September 4, 1936.

✓ Division of Charts: Attention: Mr. E. P. Ellis

Plane of Reference

~~Tide Reducers~~ approved in
9 volumes of sounding records for

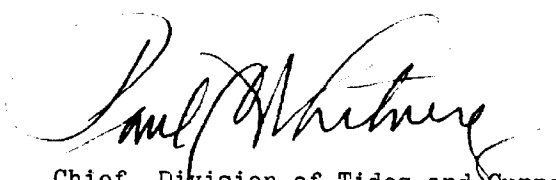
HYDROGRAPHIC SHEET 6102

Locality Hale Passage, Puget Sound, Wash.

Chief of Party: Jack Senior in 1935
Plane of reference is mean lower low water
4.9 ft. on tide staff at Steilacoom
11.7 ft. below B.M. 1 (1935)
4.0 ft. on tide staff at Arletta
26.4 ft. below B.M. 1

Height of mean high water above plane of reference is 12.4 feet at Steilacoom; 12.4 at Arletta.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

GEOGRAPHIC NAMES

Survey No. H6102

Name on Survey	<div style="display: flex; justify-content: space-between; font-size: small;"> On Chart No. 6460 On previous survey No. 71671 On U. S. <u>Quadrangle</u> Maps CINDEX From local information On local Maps P. O. Guide or Map <i>U.S. Geog. Names</i> <i>Rand McNally Atlas</i> <i>U.S. Light List</i> </div>										
	A	B	C	D	E	F	G	H	K		
<u>Horsehead Bay</u> ✓	*			—					—	1	
<u>Wholchet Bay</u> ✓	*	✓		+			—		—	2	
Fosdick Point <u>Fosdick</u> ✓	*						✓			3	
<u>The Narrows</u> ✓	*	✓		✓					✓	4	
<u>Hale Passage</u> ✓	*	✓		✓			—		✓	5	
<u>Carr Inlet</u> ✓	*	✓	—	—			✓	+	—	6	
<u>Days Island</u> ✓		✓					*			7	
										8	
										9	
										10	
										11	
										12	
										13	
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										26	
										27	

Names underlined in red approved
 by *[Signature]* on 6/12/36

Remarks

Decisions

1		
2		<u>Whollochett</u>
3		
4		
5		
6		
7	<u>not "Day"</u> named after Stephen W. Days saw back in 1847.	<u>Days</u>
8		
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27		

Field Records Section (Charts).

HYDROGRAPHIC SHEET NO. **H6102**

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

Number of positions on sheet	.3312
Number of positions checked	...41.
Number of positions revised	....11.
Number of soundings recorded	.9332
Number of soundings revised	...45.
Number of signals erroneously plotted or transferred	.....

Date: *Oct. 30, 1936.*

Verification by *W. R. Jackson*

Time: *99 hrs.*

Review by *Harold W. Murray*

Time: *23 "*

Ver. Corrections by *"*

1 "

HYDROGRAPHIC SURVEY NO. H6102

Smooth Sheet Yes

Boat Sheet 1

Sounding Records 10 Vols. _____

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes

Landmarks for Charts (Form 567) Yes

Statistics Yes

Approved by Chief of Party No, yes, but not on standard form.

Recoverable Station Cards (Form 524) No

Special Chart for Lighthouse Service No
(Circular Nov. 30, 1933)

Remarks _____

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY }
 DESCRIPTIVE REPORT } No. H 6102
 PHOTOSTAT OF } No. T

{ received APR 16 1936
 { registered MAY 12 1936
 { verified
 { reviewed
 { approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE	Initial	Attention called to
20		
22		
24		
✓ 25	✓	Pages 3 and 4 - D. R.
26		
✓ 30	✓	Page 4 - D. R.
40		
62		
63		
82		
83		
88		
90		

RETURN TO

82	
----	--

G. K. Green *May 12 - '36*

Report on H-6102

1. The records conform to the requirements of the general instructions except: - (a) recorders used ^{nevertheless very neat and legible ~~very faint~~} too fancy writing instead of plain legible figures, (b) The tide reducers were entered first in fms. and then in ft. giving a ^{See Rev. for additional remarks.} greater chance for confusion and error. _{This appears to be a correction, or change made in review. ~~xxxx~~}
2. None of the drafting had to be done over. The topography was checked with sheets T-6445 ^{T-6445} and T-6446.
3. The cross lines of edge agree.
4. The usual depth curves were completely drawn.
5. There are no floating aids to navigation on this sheet.
6. The junctions with contemporary adjacent sheets H-5931 and H-6105 are satisfactory. The junction with H-6103 is satisfactory except, (a) Lat. 47-16.9 Long. 122-42 A sdg. of 35 fms. falls on a 46 of this sheet. The 35 sdg. from H-6103 seems to be in error by 10 fms. or else it is not properly located. If the fix is changed, shifting the night object up shore one signal, the sdg. seems to fall in its proper place. _{See Rev., par. 6c for discussion. Sounding accepted! ~~xxxx~~}
7. The field plotting was satisfactory.

Respectfully submitted,
William R. Jackson

10/30/36

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6102 (1935) FIELD NO. 8

Hale Passage, Puget Sound, Washington.

Surveyed in 1935 - Scale 1:10,000.

Instructions dated March 29, 1934 (Letter to EXPLORER)

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - Jack Senior
Surveyed by - L. C. Wilder and W. Weidlich
Protracted by - R. J. Sipe
Soundings plotted by - R. J. Sipe
Verified and inked by - W. R. Jackson

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except that degree and minute symbols were not shown on latitude and longitude values. These were added in the office.

The Descriptive Report is unusually clear and comprehensive and satisfactorily covers all items of importance. It is suggested, however, that specific items be referenced by latitude and longitude values instead of distances to nearby signals.

The Descriptive Report (page 3) states that the clearance under the wooden bridge connecting Days Island with the mainland was not measured but that it is about 10 feet at MHW. A descriptive note on T-6446 (1935) states that the clearance is 20 feet at MHW. Because of the large discrepancy the matter has been referred to the field party.

10.5' reported
in main chan-
nel in letter
dated 1/29/37
attached to P.R.
HWM 7/17/37

2. Compliance with Instructions for the Project.

The plan, character and extent of the survey satisfy the instructions for the project.

3. Shoreline and Signals.

The shoreline and signals are from plane table surveys: T-6445 (1935), T-6446 (1935) and T-6448 (1935).

The sextant cuts locating the one hydrographic signal are recorded in sounding volume 2.

4. Sounding Line Crossings.

Agreement of such cross lines as were run or result from the work are satisfactory. Several discrepancies, however, are listed in the Descriptive Report (page 4). These were generally smoothed out in the office.

5. Depth Curves.

The usual depth curves may be satisfactorily drawn.

6. Junctions with Contemporary Surveys.

- a. The junctions on the northeast with H-5931 (1935) and on the extreme south with H-6104 (1935) are satisfactory.
- b. The junctions on the northwest, west, and southwest with H-6105 (1935) and H-6103 (1935) are satisfactory. However, in lat. $47^{\circ}17.0'$, long. $122^{\circ}42.0'$, a 37 fm. sounding from the former survey and a 35 fm. from the latter fall in depths of 40 to 47 fms. on the present survey. It is barely possible that these soundings were obtained on a small shoal area and they have therefore been accepted.

7. Comparison with Prior Survey.a. H-1426 a (1878).

This survey covers the area eastward of long. $122^{\circ}37'$. Wholloch Bay is on a scale of 1:10,000, the remainder of the sheet is on a scale of 1:20,000. The latter development is fairly close inside the 10 fm. curve but is increasingly sparse outside the curve. When 3.2 feet is added to the soundings of the 1878 survey to bring the plane of reference into agreement with the plane of reference on the present survey, depths on the two surveys are generally in good agreement. The dispositions of several important rocks, reefs and soundings shown on the old survey are as follows:

- (1). The 1878 survey shows a rocky reef in lat. $47^{\circ}14.4'$, long. $122^{\circ}33.8'$ (charted as a single rock awash) which falls just inside the low water line on the present survey. The reef was located by two detached positions (6 and 7 t, red), one at either end, during a tide 2.1 feet above MLLW. A note in the records states that the "reef is awash at this time" and extends in a straight line between the two positions. (a distance of 130 meters). Depths in this vicinity on the present survey were obtained during tides of $6\frac{1}{2}$ to $8\frac{1}{2}$ feet; however, the Descriptive Report (page 5, par. 4) states that the area was visited at low water and that there are many small boulders on the shoal but none of enough importance to warrant locating. The best representation of this feature would be the notation "boulders" and this has been added to the present survey.

- (2). The 1878 survey shows a rock awash (not charted) in lat. $47^{\circ}15.3$, long. $122^{\circ}33.0'$ which falls in depths of about $\frac{1}{2}$ fm. on the present survey. This rock was observed on a passing line (pos. 58 to 59 r, red) during a tide of 7 feet and is referred to in a note as "boulder awash" 20 m. to starboard. The hydrographer of the present survey makes no mention of this boulder although he passed within 20 m. on both the inshore and offshore side at tides of $9\frac{1}{2}$ feet and, in two other instances, was within 50 m. of the boulder during a zero to $\frac{1}{2}$ foot tide. The bottom here is "rocky." In as much as a cluster of boulders (accentuated dots) is also indicated here on T-1671 (1877-78), the best representation of this feature would be the notations "boulders" and has been so indicated on the smooth sheet.
- (3). Along the eastern shore of "The Narrows," the 1878 survey shows three separate clusters of rocks awash (cluster in lat. $47^{\circ}15.6'$, long. $122^{\circ}32.8'$ charted as a single rock awash, also indicated (accentuated dots) on T-1671 (1877-78)), which fall close to the low water line on the present survey. These rocks, without exception, are noted in the sounding records and are referred to as "rocks or boulders" on the beach. These features have been carried forward on the present survey but are represented by the notation "boulders" in color.
- (4). The $\frac{1}{2}$ fm. sounding accompanied by the notation "Rk" in lat. $47^{\circ}17.2$, long. $122^{\circ}32.8'$ was carried forward from this 1878 survey and is discussed in the review of H-5931 (1935), (par. 7 a).

considered dis-
proved. For
discussion, see
Rev. (par. B-13)
of Ad. Wk. (1936)
attached to
D.R. of H-5710.
H.W.M. 2/3/37

b. H-1445-a (1879).

This 1:20,000 scale survey covers the area westward of long. $122^{\circ}37'$. When 3.2 feet is added to the soundings of the 1879 survey to bring the plane of reference into agreement with that of the present survey, depths on the two surveys are generally in good agreement. Several changes, however, are noted in the shoaler areas. Horsehead Bay has deepened about $\frac{1}{4}$ fm. in the area southward of lat. $47^{\circ}17.7'$ and shoaled about 1 fm. at the mouth between lat. $47^{\circ}17.7'$ and lat. $47^{\circ}18.0'$. Additional changes or differences are noted in the Descriptive Report (page 5).

The $3\frac{2}{6}$ fm. sounding (charted as $3\frac{1}{4}$) originating with this survey in lat. $47^{\circ}16.8$, long. $122^{\circ}39.8'$ falls in depths of $4\frac{1}{6}$ to $8\frac{1}{4}$ fms. on the present survey. It is a single sounding obtained on line (pos. 17 to 18 x, red). The development here on the present survey is not very close and in view of the general good agreement between the two surveys in the immediate vicinity, the sounding has been carried forward

Ad. Wk. not
sufficient to
disprove sdg.
See Rev. (par.
B-16) of Ad.
Wk. (1936)
attached to
D.R. of H-5710.
H.W.M. 2/3/37

to the present survey.

8. Comparison with Chart 6460 (New Print dated July 20, 1936).

a. Hydrography.

Soundings shown on the chart originate with surveys discussed in previous paragraphs and need no further consideration in this review.

b. Aids to Navigation.

The two lighted beacons located on the present survey in the vicinity of lat. $47^{\circ}17'$, long. $122^{\circ}32'$ agree substantially with the positions as charted and satisfactorily mark the features intended.

c. Miscellaneous

(1). The charted character just south of the rock awash in lat. $47^{\circ}16.5'$, long. $122^{\circ}38.7'$, which has the appearance of a sunken rock is in reality a vertical line between 2 sounding dots and is very likely an ink smudge. It should be removed in future charting.

(2) The cable area designated in red in lat. $47^{\circ}16'$, long. $122^{\circ}37'$ originates with Chart Letter 178 (1935).

9. Field Plotting.

Field protracting and plotting were accurate and conform to the requirements of the Hydrographic Manual.

10. Additional Field Work Recommended.

No additional field work is required.

11. Superseding Previous Surveys.

Within the area covered, the present survey with the indicated additions from previous surveys supersedes the following surveys for charting purposes:

H- 1426-a (1878) In part.
H- 1445-a (1879) "

12. Reviewed by Harold W. Murray, Nov. 5, 1936.

Inspected by A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green.*
Chief, Section of Field Records

J. E. Peacock
Chief, Section of Field Work.

L. O. Robert.
Chief, Division of Charts.

Stude
Chief, Division of H. & T.

CKG
KTA
S
SW

80-LMW

December 5, 1936.

To: Commanding Officer,
U. S. C. & G. S. Ship EXPLORER,
601 Federal Office Building,
Seattle, Washington.

From: The Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

Subject: Days Island Bridge Clearance.

There is a discrepancy between topographic and hydrographic sheets in the clearance of the wooden bridge connecting the north end of Days Island with the mainland.

The Descriptive Report accompanying H-6102 (1935), Field No. 8 states that the clearance of this bridge was not measured but was about ten feet at mean high water. A descriptive note on T-6446 (1935) states that the clearance is twenty feet at mean high water. Because of this large discrepancy you will please ascertain the correct clearance in order that it may be correctly noted on the charts.

Your records state that the bridge is a "temporary wooden structure". If a permanent structure is under construction at this time please advise as to its location and proposed clearance.

Very truly yours,

(Signed) PAUL C. WHITNEY,
Acting Director.

Jan. 29th, 1937
See Reply, attached to Descriptive Report.

LCW.

80 KTA

POST-OFFICE ADDRESS: 601 - Federal Office Building, Seattle, Washington.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

82 EKG
A.R.S.

1037
A 3 - M 12 20

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
U.S.C. & G.S.S. EXPLORER

January 29, 1937.

To: Director, U. S. Coast & Geodetic Survey,
Washington, D. C.

From: Commanding Officer, U.S.C. & G.S.S. EXPLORER,
Seattle, Washington.

Subject: Days Island Bridge Clearance.

Reference: Director's letter of December 5, 1936,
80-LMW.

The clearance of this bridge has been examined and found to be as follows; 10-1/2 feet above mean high water at the present channel under the trestle near the Days Island end and 15 feet above mean high water under the 45 foot horizontal span near the mainland end of the bridge. This probably was the old channel but is now shoal.

The bridge is a wooden structure but not temporary. The eastern approach is being rebuilt in its old position.

G. C. Jones
G. C. Jones,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

*10 1/2' clearance has been shown on H-6102. Because of uncertainty in position and unimportance, no disposition was made of the 15' clearance
HWM 7/17/37*

Applied to Oht. 6460 June 1, 1938. X.P.

6103

(And Addl. Wk. 1936,
For which SEE 5710,
Addl. Wk. 1936, D.R.)

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 14 1936
Acc. No. _____

6103

(And Addl. Wk. 1936,
For which SEE 5710,
Addl. Wk. 1936 D.R.)

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, Director

State: Washington

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 9. 6103
Hydrographic }

LOCALITY

Puget Sound

Green Point to South end of Fox

Island, Carr Inlet

1935.

CHIEF OF PARTY

Jack Senior

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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. 9

REGISTER NO. H6103

State Washington

General locality Puget Sound

Locality ~~Green Point to South end of Fox Island, Carr Inlet~~

Scale 1:10,000 Date of survey July - September, 1935.

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by W. Weidlich

Protracted by W. Weidlich

Soundings penciled by W. Weidlich

Soundings in fathoms ~~feet~~

Plane of reference Mean lower low water

Subdivision of wire dragged areas by _____

Inked by G H Everett

Verified by "

Instructions dated March 29, 1934.

Remarks: _____

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET NO. 9,
GREEN POINT TO SOUTH END OF FOX ISLAND, CARR INLET,
PUGET SOUND - WASHINGTON

AUTHORITY:

The hydrography on this sheet was executed under instructions of the Director, U. S. Coast and Geodetic Survey, dated March 29, 1934. ✓

SCALE:

The scale is 1:10,000, and soundings are in fathoms and fractions thereof. ✓

LIMITS:

This survey covers the entire navigable area of the southern part of Carr Inlet and connects at the northern limits near Green Point with sheet No. 11, (1:20,000)^{*}; at the southern limits with sheet No. 10, (1:10,000); and in Pitt Passage, connects with sheet No. 12 (1:10,000), near station "PASS". ✓ * Sheet # 8 (1:10,000)

METHODS:

The approved methods of the service were used throughout. The launch "Delta" was used for all the work and the day letters are shown in red. ✓

A ten pound handlead was used in depths of less than 15 fathoms and in greater depths a steam sounding machine with an eighteen pound lead and stranded wire. ✓

With the exception of a few lines at the north end of the sheet, practically all lines were spaced 100 meters apart. The work was much closer near the west shores and the lines were spaced about 50 meters apart. ✓

All lines run in an easterly and westerly direction, with the exception of the lines at the head of Mayo Cove and the cross lines in Pitt Passage. ✓

All sounding lines were run wherever possible on ranges and no compass headings were entered in the sounding volumes. All soundings are up and down. ✓

CONTROL:

Topography and triangulation furnish the necessary control. Signal "ER" was established at the east shore of Pitt Passage, south of station "PASS". This signal was located by sextant fixes and result entered in sounding volume No. 8, page 72. ✓

Signals destroyed by forest fires on the west shore of Fox Island were rebuilt and located by the hydrographer. The fixes obtained were recorded in volume No. 5, page 72, but were rejected as the visibility was very poor and the results were doubtful. The signals in question were relocated by the topographer some time later. ✓

Signals "DA" and "LIND" are transmission towers connecting McNeil Island with the Peninsula. Signal "OUT" is a pile about 70 meters from the high water line at the west shores of Fox Island. Signal "PLAN" is a prominent stump, well anchored in sandy bottom about 20 meters from the shore. Signal "BIM" (also station "GOLDSBOROUGH", established in 1857) is a very prominent rock about 10 feet high, 15 feet in diameter and about 20 feet from the high water line. ✓

LOW WATER LINE:

The low water line was determined by the lead in practically all cases. ✓

TIDES:

Tide reducers were obtained from the records of the automatic portable tide gauge maintained at the dock at Steilacoom. ✓

KELP:

The west shores of Fox Island is free of kelp, except at the south end where the kelp is comparatively thick during the summer months. There are a few isolated patches of thin kelp at the north shore of McNeil Island, which are visible only at low tides. Kelp is very thick in Pitt Passage near the west shore of McNeil Island between station "PASS" and signal "LIND". ✓

COMPARISON WITH PREVIOUS SURVEYS:

On account of the scarcity of soundings on chart No. 6460, and not having a photostat copy of previous surveys on hand, a fair comparison cannot be made. This survey reveals nothing that might be considered a menace to navigation. The depths of the shoals in Pitt Passage were reduced several feet. ✓

CHARACTERISTICS OF SHORELINE AND BOTTOM:

The bottom is generally muddy in deeper water, sand and gravel with occasional small boulders near the west shore of Fox Island. Near the west shores of Carr Inlet, near McNeil Island and the mainland, the bottom as a rule is sand and gravel with occasional small boulders. The bottom north of Pitt Island is rocky throughout.

There are numerous rocks and boulders on the point northwest of Pitt Island and they extend for about 100 meters from the shore. The area north of South Head is studded with boulders with sand and gravel between. The same applies to the point at the south entrance to Mayo Cove. A ledge studded with numerous boulders extends from the southeast corner of Mayo Cove and runs parallel with the point.

The bottom in Gertrude Harbor is muddy, with sand and gravel near the shores.

The bottom in Delano Bay is sandy throughout and much deeper than shown on chart No. 6460. At the head of the bay the bottom is muddy.

In Mayo Cove the bottom is muddy in deeper water, sandy and rocky near the shore. Extensive sand flats extend for some distance at the entrance to the long and narrow bight.

The bottom in Geldern Cove is sandy with occasional boulders at the south entrance and also in the nearby small bight. At the head of the bay the bottom is muddy, with numerous piles at the north side. In the vicinity of station "GELDERN", the bottom is foul and studded with numerous rocks and boulders which bare at low tides.

Sand flats free of small rocks and boulders extend for some distance north of signal "PAT", making the area an excellent bathing beach.

DANGERS AND OBSTRUCTIONS:

Obstructions and outlying dangers are located near the west shore of Carr Inlet and Pitt Passage and they are enumerated below, beginning at the south end of Pitt Passage.

Pitt Passage
1. Foul area marked by thick kelp during the summer months lies between station "PASS" and signal "LIND". Least depth found was 1-5/6 fathoms at M.L.L.W. and lies about 120 meters 295° from station "PASS". A 5 foot spot lies about 110 meters 340° from station "PASS". This spot is surrounded by much deeper water and marks the extreme end of a shoal area between station "PASS" and signal "BIL".

Signal is on overhead cable, probably tower

*5' spot disproved for discussion, see Rev. (D.R. 156) of Add'l Mark (1936) attached to D.R. of A-5710.
H.W.M. 1/23/56*

point of shoal

Chart shows 2 1/4 fms

Chart show 3 fms.

Pitt Passage

2. A shoal area with a least depth found of one fathom at M. L.L.W., lies about 200 meters 265° from signal "LIND". The bottom is sandy and is not marked by kelp. Positions 20 and 21 y. ✓

3. The area between signal "LIND" and Pitt Island is foul with sandy and rocky bottom. Depths are very irregular. The shoal-est spot which bares at low tides, lies about 220 meters south of Pitt Island. ✓

4. A ledge extends for about 160 meters from the point north of station "PITT". There are several large rocks which bare from 3 to 4 feet at M.L.L.W. ✓

5. Foul area extends for about 300 meters in a northeasterly direction from the island and a 4 foot spot about 290 meters 38° from signal "GUS", marks the limits. Bottom is sandy and rocky and is not marked by kelp. At M.D.L.W. a part of this area bares for about 110 meters from the island. (Pitt Id) ✓

6. The depths on the shoal southwest from the point on which station WYCK", is located was reduced from 5-4/6 fathoms (chart No. 6460) to 4-5/6 and 4-1/2 fathoms. This shoal is really an extension of the foul area northeast of Pitt Island and has much deeper water on either side. The 4-1/2 fathoms spot lies about 370 meters 268° from signal "DIN", positions 64 - 65 y. The 4-5/6 fathoms spot lies about 430 meters 245° from station "WYCK", position 61 y. A 5-1/2 fathoms spot lies about 400 meters 287° from station "WYCK", positions 51 to 55 y. Bottom on this shoal is sandy throughout. ✓

7. A shoal with a least depth found of 5 fathoms at M.L.L.W., lies about 880 meters 292° from station "WYCK". Bottom is soft and sandy. Chart No. 6460 shows a depth of 5-1/2 fathoms. Position 21 u. ✓

8. The center of Wyckoff-Reef (Wyckoff Shoal in "Pacific Coast - Coast Pilot", page 304, paragraph 1) which bares from 1/2 to 3 feet at M.L.L.W. lies about 880 meters 328° from station "WYCK". In view of the fact that the height of the rocks was determined by topography no attempt was made to run sounding lines across the reef on a falling tide. This reef covers a considerable area and at its eastern and western limits drops off into much deeper water. ✓

There is a "Wyckoff Reef" in California (San Miguel Island)

9. Shoal area consisting of sand and mud extends in a northerly direction from station "WYCK", and practically connects with Wyckoff Reef. The winding channel between the reef and the shoal area has a controlling depth of 2 fathoms and is used even at minus tides by a small steamer which serves the small communities in this ✓

locality. The low water line of the shoal area extends for about 200 meters from the point.

A one fathom spot lies about 790 meters 5° from station "WYCK" gradually deepening to the eastward to the depth of 4 and 9-3/4 fathoms, positions 44 and 45 e. ✓

Lat. 47-15 Long 122-43

10. The low water line extends for about 200 meters south of station "SOUTH", diminishing in width towards the point. There are several large rocks awash and bare at M.L.L.W., north of the point. ✓

11. A rock which bares about 7 feet at M.L.L.W., lies about 160 meters 10° from station "MAYO", and marks the extreme end of the ledge extending from the point. ✓

12. A ledge in Mayo Cove extends for about 740 meters in a north-northeasterly direction from a small point on which signal "TAX" is located. The ledge has an average width of about 80 meters, is studded with numerous rocks and small boulders which bare from 1 to 5 feet at M.L.L.W. The rock awash located by topography marks the extreme end. ✓

13. A sand spit extends for about 100 and 160 meters in an easterly and southeasterly direction from a long and grassy spit extending south of signal "LADY". ✓

*Lat 47-15.7
Long 122-45.0*

Lat 47-15.6 Long 122-45

14. A sand spit extends for about 150 meters in a northerly direction and for about 220 meters in a westerly direction from signal "MEAT". The small spit extending for about 60 meters from a narrow grassy point west of signal "MINCE", is subject to change according to reports from people living in this vicinity. ✓

15. Shoal area extends for some distance north of a point on which signal "PLO", is located. The low water line extends for about 90 meters from the signal. ✓

*Lat 47-16.5
Long 122-44.9*

16. Two rocks which bare about 6 feet and are well inside the low water line lie about 180 meters east from signal "PAT". These rocks were spotted from the wharf while having lunch. See sounding volume No. 6, page 13. ✓

*Lat 47-16.4
Long 122-45.2*

17. A sand spit free of small rocks and boulders extends for about 180 meters in a northerly direction from signal "PAT". ✓

18. Foul area studded with rocks and boulders extends for about 380 meters in a southerly and for about 250 meters in an easterly direction from station "GELDERN", at the north entrance ✓

Several Rocks Transferred from B 5.

to Von Geldern Cove. The rocks which bare at low tides are well inside the low water line. Bottom otherwise is sand and gravel.

DISCREPANCIES:

Soundings of very doubtful character were obtained on "p" day, about 500 meters east of signal "LICE". Additional sounding lines were run on "s" and "u" days and the soundings obtained then correspond with those obtained on "e" day. It is recommended that sounding on position 3, and between 3 and 4, be rejected. See sounding volume No. 6, page 29, position 4. *Soundings rejected*

CURRENTS:

No current stations were occupied in this area. The flood runs in a northerly direction along the shore of Fox Island, gradually branching off towards the head of Carr Inlet, and turning eastward at the north end of Fox Island into Hale Passage. The ebb runs in a southerly direction. ✓

At the west shore of McNeil Island, in Pitt Passage, the ebb and flood runs in a northerly direction at all times, the flood continues north and the ebb follows the north shores of McNeil Island, turning south at the northeast point of the Island. The estimated velocity in Pitt Passage is from 2 to 3 knots near Pitt Island. ✓

ANCHORAGES:

SHILL
Gestade Harbor at the northeast shore of McNeil Island offers excellent anchorage to small vessels in 8 to 9 fathoms of water, sandy and muddy bottom. The wharf at the head of the Bay is in very poor condition and has a controlling depth of 10 feet at the face at M.L.L.W. Sketch will be found in volume No. 9, page 29. ✓

Small vessels will find a good anchorage in Delano Bay at the east shore of the mainland in any desired depth, taking care to anchor north of the pier. Bottom is sandy and muddy. The long pier has a controlling depth of 4 feet at the face. Sketch will be found in volume No. 6, page 61. ✓

Mayo Cove.
Small vessels find an anchorage in 8 to 9 fathoms of water about 300 meters east of a narrow grassy point. Care should be exercised to avoid the ledge, which is not marked. The wharf at the head of the bay has a controlling depth of 6 feet at the face at M.L.L.W. Sketch will be found in volume No. 7, page 21. ✓

Von Geldern Bay offers some shelter to small vessels in 2 to 3 fathoms of water, sandy bottom, about 300 meters east of the wharf and north of a small bight. The wharf at the north shore of the bay has a controlling depth of six feet at M.L.L.W. Sketch will be found in volume No. 6, page 13. ✓

CHANNELS:

Small vessels with local knowledge may negotiate Pitt Passage at any stage of tide, taking care to avoid the spit which extends eastward from station "PASS" and give the transmission tower (signal "LIND") a berth of at least 60 meters. This will lead through thick kelp during the summer months. This channel is used by a small steamer at any stage of tide and even negotiates the narrow passage east of Wyckoff Reef, at minus tides. ✓

WEATHER:

Forest fires and hazy weather interfered with the work a great deal, especially on the long sounding lines. Otherwise the sea was smooth and calm.

Respectfully submitted,

W. Weidlich

W. Weidlich,
Mate, C. & G. Survey,
U.S.C. & G.S.S. EXPLORER.

APPROVED AND FORWARDED:

Jack Senior

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

TIDAL NOTE

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 9

H6103

PUGET SOUND - WASHINGTON

Tide reducers obtained from the observations on the portable gauge at Steilacoom, were used on the entire sheet.

Latitude $47^{\circ}11'$ north - Longitude $122^{\circ}36'$ west.

Reference plane, mean lower low water..... 4.9' on staff

Highest tide observed - Oct. 11, 1935.....20.0' on staff

Lowest tide observed - July 16, 1935..... 1.4' on staff

STATISTICS

Statute miles of sounding lines.....	361.1
Number of positions.....	2655
Number of soundings, hand lead.....	9297
Number of soundings, machine.....	<u>2333</u>

11636

LUC

TIDE NOTE FOR HYDROGRAPHIC SHEET

July 8, 1936

Division of Hydrography and Topography:

✓ Division of Charts: Att: Mr. E. P. Ellis

Tide Reducers are approved in
10 volumes of sounding records for

HYDROGRAPHIC SHEET 6103

Locality South End of Carr Inlet, Puget Sound, Washington

Chief of Party: Jack Senior in 1935
Plane of reference is mean lower low water reading
4.9 ft. on tide staff at Steilacoom
11.7 ft. below B.M. 1 (1935)

Height of mean high water above plane of reference is 12.5 feet

Condition of records satisfactory except as noted below:

Ham
CCG Chief, Division of Tides and Currents.

GEOGRAPHIC NAMES

Survey No. H6103

Name on Survey	Source of Name									
	A	B	C	D	E	F	G	H	I	J
	On Chart No. 6460	On previous survey No. 72671	On U.S. Coast and Geodetic Survey Maps 1674	From local information	On local Maps	P. O. Guide or Map	Rand McNally Atlas	Orig. of Wash. Geog. Names	U.S. Geog. Names of Wash.	
<u>Von Geldern Cove</u> ✓	*		✓						✓	1
<u>Mayo Cove</u> ✓	*		✓						✓	2
<u>Pitt Passage</u> ✓	*							✓		3
<u>Carr Inlet</u> ✓	*	✓	✓	-			✓	-	✓	4
<u>Wyckoff Shoal</u>	*			✓						5
<u>Green Pt</u> ✓	*	✓	✓	-				✓	✓	6
<u>Still Harbor</u> ^{7/7} 6/6 *	*								✓	7
<u>Gertrude Island</u> ^{7/7} 6/6 *	*				✓			✓		8
										9
										10
										11
										12
										13
										14
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										25
										26
										27

Names underlined in red approved
by *[Signature]* on 6/16/36

Remarks

Decisions

1	Said to be called 'Joos bay' locally; but change from old established name not warranted	<u>Von Geldern Cove</u>
2	Said to be called 'Labe Bay' by some locally; but change from established name not warranted.	<u>Mayo Cove</u>
3		
4		
5		
6		
7		
8	Orig. Wash. names has Gertrudis this is regarded as an error, the orig. apostrophe may have become 'i'	<u>Gertrude</u>
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27		

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H6103**
.....

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

Number of positions on sheet	2665
Number of positions checked	.387..
Number of positions revised	.38
Number of soundings recorded	11630
Number of soundings revised	54
Number of signals erroneously plotted or transferred	.....

Date: *Aug. 10, 1936*

Verification by *G. H. Everett*

Time: *85 hrs*

Review by *R. J. Christman*

Time: *10 hrs*

HYDROGRAPHIC SURVEY NO. H6103

Smooth Sheet Yes

Boat Sheet 1

Sounding Records Yes - 10 Vols. _____

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes

Landmarks for Charts (Form 567) Yes

Statistics Yes

Approved by Chief of Party No *No separate approval sheet*

Recoverable Station Cards (Form 524) No

Special Chart for Lighthouse Service No *No floating aids*
(Circular Nov. 30, 1933)

Remarks _____

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY
DESCRIPTIVE REPORT
PHOTOSTAT OF

No. H **6103**
No. T

received APR 16 1936
registered MAY 12 1936
verified
reviewed
approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE	Initial	Attention called to
20		
22		
24		
✓ 25	<i>JSW</i>	<i>D. R. - pages 3-7</i>
26		
✓ 30	<i>WS</i>	<i>Page 6 of review D. R. Haight</i>
40		
62		
63		
82		
✓ 83		<i>The 3/4 fms sounding (chart 6460) 1/4 mile N of Delano Beach which should be replaced by a deeper sounding see latitude 49° 15.4' 14 6103</i>
88		
90		

RETURN TO

82	
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C. K. Green

May 10 - '36

VERIFIERS REPORT ON H-6103

The records conform to the requirements of the General Instructions.

The topography for this sheet is covered by plane table sheets nos. 6447, 6448, 6449, 6450, 6452 (1935)

Signal Lip on hydro sheet is called signal 4p on T-6449.

Signal Sec on hydro sheet is called signal Sec on T-6450

The speed of the launch shows considerable variation on certain lines which may be due to changing currents or changing the speed of the boat without noting it in the records. The plotting of signals was carefully compared with topo sheets to see if an error in signals would account for some of this variation. It was noticed that on some lines differences in speed occurred on changing the fix. However as the signals check the topo sheets and the variation in speed could not consistently be called a "signal jump" there appears to be no definite reason to question any signal.

Reasons for revising positions are noted in the records. Several positions were numbered wrong. Many were due to erroneous plotting as compared with the B.S. and as recorded.

It is noted in Vol. II pg. 29 that the field plotter rejected several shallow soundings between 13 and 14. The same area was covered on 4 day (Lat 47-14.25; Long. 122-43.1). The deeper soundings on 4 day were plotted as accepted in the field.

The nature of hydrographic signal "Er" is not given see page 2 par. 1 of Disc. Rep.

H-6103

Junctions.

Junction with H-6106 is good. The other adjoining sheets have not been verified to date. Curves were broken on this sheet where they might be affected by these junctions. ✓

Curves all curves may be completed. ✓

Submitted Aug. 10, 1936
J. H. Everett

Mr. Shalowitz

*This add'l Work accomplished. For discussion, see
Rev. (par. B-15) of Add'l Work (1936) attached to
D. R. of H-5710.*

22-AB
1936 EX 4

*JF
WF
SK*

August 20, 1936.

To: The Commanding Officer,
U.S.C. & G.S. Ship EXPLORER,
601 Federal Office Building,
Seattle, Washington.

Through: The Inspector, Seattle Field Station.

From: The Director,
U. S. Coast and Geodetic Survey.

Subject: Additional work on sheet No. H-6103, Field No. 9, 1936.

Reference: Supplemental Instructions dated August 18, 1936.

During the course of the review of hydrographic sheet No. H-6103 a question developed concerning the correct location of the portion of the sounding line between positions 11-X and 13-X. It is noted that although the time interval between position 11-X and position 12-X is 10 seconds longer than between 12-X and 13-X, the distance traversed by the hydrographic launch is less. It is also noted that, if the left angle at position 12-X had been read in error by reading the 5-minute mark on the vernier instead of the zero, the spacing between positions would better correspond to the time intervals and the depth curves would appear more logical. However, it is also noted that between positions 11-X and 12-X the launch was crossing a kelp bed which might easily account for a slower speed of the launch between position 11-X and position 12-X and the resulting depth curves are by no means impossible.

The matter is important as the present plotting of this part of the sounding line places a 5-foot sounding in much deeper water and practically blocks what would otherwise be a navigable channel.

You will please investigate this immediate vicinity and verify the position of the 5-foot sounding and also the protrusion of the 6-foot curve. A tracing of a section of the hydrographic sheet in this vicinity is furnished you herewith. The fix used for position 12-X was as follows:

Man	99 - 58
Lane	
Bid	48 - 38

If the left angle were incorrectly read as indicated above the correct left angle would be $45^{\circ} 20'$.

There are also furnished you herewith advance copies of the reviews of hydrographic sheets Nos. H-5932 and H-5931. An advance copy of the review of sheet No. H-6103 will be sent you at an early date.

(Signed) J. H. HAWLEY

Acting Director.

Enclosures.

Additional development was also called for on the tracing itself at the junction between H-6103 and H-6106. The field party called attention to the insufficient development at the junction in the descriptive report (pages) of H-6106.

A.L.S.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6103 (1935) FIELD NO. 9

South End of Carr Inlet, Puget Sound, Washington
Surveyed in July - September, 1935 - Scale 1:10,000
Instructions dated March 29, 1934 (EXPLORER).

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - Jack Senior.
Surveyed by - W. Weidlich.
Protracted by - W. Weidlich.
Soundings penciled by - W. Weidlich.
Verified and inked by - G. H. Everett.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except that no separate "Approval of Records" was attached to the Descriptive Report. (Par. 174, Hydrographic Manual).

The Descriptive Report is very complete and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The plan, character and extent of development are in accordance with the instructions for the project.

3. Shoreline and Signals.

Shoreline and topographic signals are derived from plane table surveys T-6447, T-6448, T-6449, T-6450 and T-6452 all of 1935.

Hydrographic signal Er was located by sextant fix recorded in Sounding Volume 8, page 72.

4. Sounding Line Crossings.

No regular system of cross lines was run. The depths on adjacent parallel lines and on the cross lines resulting from development work, are in good agreement.

5. Depth Curves.

Within the area of the survey the usual depth curves can be satisfactorily drawn.

6. Junction with Contemporary Surveys.

The junctions with H-6105 (1935) and H-6102 (1935) to the north; H-6104 (1935) to the southeast; and H-6106 (1935) to the southwest will be considered in the reviews of those surveys.

7. Comparison with Prior Surveys.

H-1445a (1879), H-1426b (1879).

These surveys on scales of 1:20,000 cover the area embraced by the present survey with widely spaced soundings. Notes on the sheets give values to correct the soundings to Mean Lower Water. Due to closer development on the present survey, there are a number of differences in inshore details but depths in general are in very good agreement except in the following cases:

- a. On Wyckoff Shoal (lat. 47°14.25', long. 122°42.50') the 1879 survey (H-1445a) shows the highest rock as - 8 feet (5 feet at MLLW), whereas the 1935 survey shows the same rock as "bare 2 feet at MLLW". Both positions and elevations of rocks on the shoal were determined by the topographer during the 1935 survey. This matter has been referred to the field party for verification. (See Supplemental Instructions to EXPLORER, Aug. 18, 1936). 1935 determination confirmed. For discussion, see Rev. (p. 152) of Add'l Work (1936) attached to D.R. of H-5710. H.W.M. 1/25/37

- b. A 5 foot spot (lat. 47°13.12', long. 122°42.88') about 110 meters 340° from station "Pass" is partially discredited by H-1445a (1879) which shows a clear channel through this part of Pitt Passage. A check of the 1935 sounding records shows that the 5 foot is the first sounding after pos. 12X. If this position were disregarded and the soundings plotted by time between pos. 11X and pos. 13X it would place the 5 foot sounding considerably closer inshore. However, as the Descriptive Report, page 3, under "Dangers and Obstructions" notes a 5 foot spot surrounded by much deeper water, the matter has been referred to the field party for further examination. For a fuller discussion of this matter see copy of letter to field party attached to the Descriptive Report. Disproved. For discussion, see Rev. (p. 156) of Add'l Work (1936) attached to D.R. of H-5710. H.W.M. 1/25/37

Because of the larger scale and the closer development, as well as the few minor changes that have taken place in inshore areas, H-6103 (1935) should supersede the above surveys for charting purposes.

8. Comparison with Chart 6460 (New Print dated July 20, 1936).

a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraph and contains

no other information that needs consideration in this review.

b. Aids to Navigation.

No aids to navigation are charted within the area of the present survey.

9. Field Plotting.

The field plotting in general was satisfactory. A few positions were found erroneously plotted and were revised in the office.

10. Additional Field Work Recommended.

The survey is very satisfactory and no further work is required except a verification of the elevation of Wyckoff Shoal and an examination of the 5 foot spot discussed respectively in par. 7a and 7b of this review.

Examined. For discussion, see Rev. Com. 15 of Add'l Wk. (1936) attached to D.R. of H-570

11. Note to Compiler.

Attention is called to par. 7a and 7b of this review regarding the requested verification of certain information shown on this sheet.

12. Superseding Old Surveys.

Within the area covered the present survey supersedes the following surveys for charting.

H-1426b (1879) in part
H-1445a (1879) " "

13. Reviewed by - R. J. Christman, August 13, 1936.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

L. O. Pollock
Chief, Division of Charts.

Fred. L. Peacock
Chief, Section of Field Work.

F. Wade
Chief, Division of H. & T.

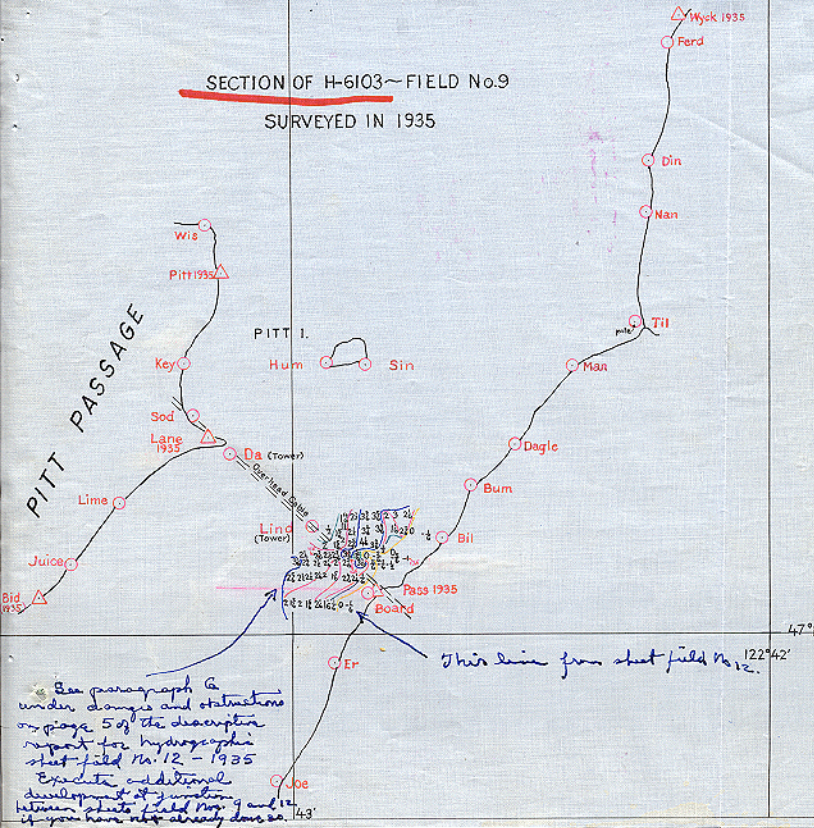
43'

122°42'

14'

SECTION OF H-6103~FIELD No.9

SURVEYED IN 1935



Applied to Cht. 6460 June 6, 1938 K.K.

6108

(And Additional Work, 1936,
For Which See 5710,
Additional Work, 1936 D.R.)

U. S. COAST & GEODETIC SURVEY
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Acc. No. _____

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

R.S. Patton, Director

State: Washington

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 14 6108
Hydrographic }

LOCALITY

Puget Sound

Nisqually Reach

1935.

CHIEF OF PARTY

Jack Senior.

(And Additional Work, 1936,
For Which See 5710
Additional Work, 1936 D.R.)

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

HYDROGRAPHIC TITLE SHEET

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. 14

REGISTER NO. **H6108**

State Washington

General locality Puget Sound

Locality Nisqually Reach

Scale 1:10,000 Date of survey Sept. 21 to Oct. 11 1935.

Vessel U.S.C. & G.S.S. EXPLORER

Chief of Party Jack Senior

Surveyed by L. C. Wilder

Protracted by H. F. Garber

Soundings penciled by H. F. Garber

Soundings in fathoms ~~feet~~

Plane of reference mean lower low water

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated March 29, 1934.

Remarks:

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 14

PUGET SOUND - WASHINGTON

1 9 3 5.

AUTHORITY:

This survey was made under instructions to the Commanding Officer, Ship EXPLORER, dated March 29, 1934.

LIMITS:

It covers the waters of Nisqually Reach from an east and west line from Colé Point at the east side of Ora Bay to a southwest line from Devils Head and into Drayton Passage to a cross channel line north of Amsterdam Bay. The survey includes Ora and Amsterdam Bays and the Nisqually tide flats.

SCALE:

The scale of this survey is 1:10,000.

CONTROL:

Control was furnished by triangulation stations and topographic stations located on a scale of 1:10,000.

METHODS:

Standard Coast Survey methods for hydrography were used. Hand-lead soundings up to fifteen fathoms with a ten pound lead and machine and eighteen pound lead in deeper water. Location of soundings and sounding line were by three-point fix and signals located by triangulation and topography.

A few hours sounding was done by Lieutenant Baum on the west edge of Nisqually Flats with skiff and outboard. The boat was stopped on each position as he had no left angle man.

Considerable difficulty was experienced in completing the sheet (off Nisqually Flats) due to heavy fogs and consequent hazy atmosphere, at the close of the season. The hydrographer was not satisfied with the development at the north edge of Nisqually Flats and it is intended to request that the boat sheet be returned from the Office for a small amount of additional work.

GENERAL CHARACTERISTICS OF SHORELINE AND BOTTOM:

Between the high and low water lines most of the shores are sand or gravel or both sand and gravel. The shoreline in the inner part of Ora^o Bay, e.i., the small arm in which the dock at Vega is located, is mud and clay. Ora^o Bay, proper, has a shoreline of sand or gravel and scattered boulders in places, also the east shore north of Dupont Powder Wharf, the southwest shore of Anderson Island and the south shore from Nisqually Flats westward to the west limits of the sheet. There are scattered boulders in many places, Nisqually Flats is mud, surfaced with sand. The shore of Anderson Island from Treble Point into and north of Amsterdam Bay is sand.

The bottom outside the ten fathom curve is mud except through Nisqually Reach off Nisqually Flats and along the east shore, north thereof.

Ora^o Bay and its east and west arms are mud bottom. The bottom in Amsterdam Bay is Sand.

DANGERS, OBSTRUCTIONS AND SHOALS:

The shoal spit in Latitude $47^{\circ}08.3'$, Longitude $122^{\circ}42.0'$, sand bottom, makes a rather difficult channel into the west arm of Ora Bay and the dock at Vega. Small boats frequently hit this spit. The two fathom curve makes out about 230 yards north of the south point.

Examination of the shoal water making out to the south and westward of the south end of Anderson Island disclosed no dangers to navigation. The shoalest indication was a three and one half fathom sounding two hundred meters south of the high water line at this point. This lies seventy meters outside the two fathom curve.

The ten fathom curve trends to the west from the above shoal. Inside this ten fathom curve the bottom is sand and uneven. A careful examination was made by splitting all lines and feeling for least depths and the $6-4/6$ fathom sounding, Position 87, r day, in Latitude $47^{\circ}07.43'$, Longitude $122^{\circ}42.56'$ was the least water obtained. Further to the west are scattered $10-1/2$ to 12 fathom humps but no possibility of depths more than a few feet less than these spots.

The shoal spit on the south side of the entrance to Amsterdam Bay makes up to within 70 yards of the north shore. The channel into the Bay is narrow and shoal and there is but $1/2$ fathom of water in the bay.

CHANNELS, AIDS AND RANGES:

About eighteen feet at mean lower low water can be carried into the west arm of Ora Bay but the channel is narrow and shoal water makes well out from the south and northeast points at the entrance. There are no material ranges and local information is required even for small boats. There is seven feet at mean lower low water at the offshore face of the dock at Vega.

There is a slough channel from the north along the south shore into the Giant Powder Works wharf at topographic signal "BANK". This channel continues to the southeast of this dock. There is 24 feet of water at the offshore face of this dock, 20 feet, 70 yards due north of the dock.

The channel into Amsterdam Bay is narrow and shoal, a least depth of 1/6 fathom in the channel and 1/2 fathom further in the bay. Local information is necessary.

Black Can Buoy "1" off Nisqually Flats is in 47 feet of water. The hydrographic location differs 13 meters from the topographic location due probably to scope of the anchor chain.

There are no established ranges in the area of this sheet. No natural ranges were available for practical use.

ANCHORAGES:

Anchorage is available in Ora Bay in from 12 fathoms to 3 fathoms depending upon shelter sought and size of the vessel. Only the western arm of the bay would afford shelter in the majority of storms which are infrequent but generally come from the south to southeast, occasionally from a northerly direction.

Amsterdam Bay is available for small boats if they have local knowledge.

Better shelter for boats of all sizes is available by anchoring in the lee of whatever shore of Nisqually Reach will give the best protection. The south shore west of the flats is suitable in southerly or southwesterly weather. The east shore north of the flats is steep except approaching Cormorant Passage.

CURRENTS AND TIDE RIPS:

No unusual currents, other than normal tidal currents were noticed. Strongest currents and tide rips were noticed off the

south tip of Anderson Island. There seems to be a counter current into Thompson Cove on the flood. No tide rips were seen elsewhere.

DISCREPANCIES:

The hydrographic location of the black can buoy off Nisqually Flats is 13 meters east of the topographic location. Check fixes were taken by the launch party and during an ebb tide. The scope of the buoy would account for most of this error.

Positions 41 "N" to 42 "N" were soundings off the Dupont Powder wharf. Sounding 43 "N" to 44 "N" alongside the wharf are considerably shoaler but closer than the previous line. The slope is fairly steep here and the small difference in distance off the dock accounts for the difference in depths.

COMPARISON WITH EXISTING SURVEYS:

Comparison with Chart No. 6460. There are few evident differences by comparison with this chart. There is a narrow channel into Amsterdam Bay where the old survey shows none. One mile due west of the south tip of Anderson Island the bottom is lumpy with a least sounding of 10-1/2 fathoms. The chart shows 12 fathoms here.

LANDMARKS:

There are no prominent landmarks within the area of this sheet.

The docks and the buoy off the flats are the only objects a pilot can use.

GEOGRAPHIC NAMES:

Nisqually Reach - chart and local name.

Nisqually Flats - Chart and local name.

Or^o Bay - chart and local name.

*Thompson Cove - name on local chart.

Amsterdam Bay - chart and local name.

Drayton Passage - chart and local name.

*Cove just west of the south tip of Anderson Island.

Respectfully submitted,

L. C. Wilder

L. C. Wilder,
H. & G. Engr., C. & G. S.,
U.S.C. & G.S.S. EXPLORER.

APPROVED AND FORWARDED:

Jack Senior

Jack Senior,
Commanding Officer,
U.S.C. & G.S.S. EXPLORER.

TIDAL REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 14, H6108

NISQUALLY REACH - PUGET SOUND

WASHINGTON.

During the progress of this hydrographic survey a portable automatic gauge was in operation at Longbranch, Filuce Bay and one at the Dupont Powder Wharf on the east side of Nisqually Reach.

Reducers were from the Long Branch gauge for all sounding to the westward of a line from Latitude $47^{\circ}08.28'$, Longitude $122^{\circ}43.27'$ to Latitude $47^{\circ}06.95'$, Longitude $122^{\circ}45.28'$ and all soundings eastward of this line were referred to the Dupont Powder Wharf gauge.

LONGBRANCH, WASHINGTON

Lat. $47^{\circ}12.6'$, Long. $122^{\circ}45.3'$ W.

Reference Plane, M.L.L.W.-----4.56 on staff

Highest Tide, Sept. 15-----20.2 on staff

Lowest Tide, Sept. 10-----3.5 on staff

Period of operation: August 24 to Oct. 5, 1935.

DUPONT POWDER WHARF

Lat. $47^{\circ}07.1'$, Long. $122^{\circ}40.0'$

Reference Plane, M.L.L.W.-----3.38 on staff

Highest Tide, Oct. 10-----17.5 on staff

Lowest Tide, Oct. 2-----3.4 on staff

Period of operation: Sept. 25 to Oct. 11, 1935.

STATISTICS

Number of positions.....	2495
Number of soundings (hand lead).....	5326
Number of soundings (machine).....	2082
Statute miles of sounding lines.....	286.0

TIDE NOTE FOR HYDROGRAPHIC SHEET

September 4, 1936.

Division of Hydrography and Topography:

✓ Division of Charts: Attention: Mr. E. P. Ellis

Plane of Reference
~~Tide Reducers~~ are approved in
8 volumes of sounding records for

HYDROGRAPHIC SHEET 6108

Locality Nisqually Reach, Puget Sound, Wash.

Chief of Party: Jack Senior in 1935
Plane of reference is mean lower low water reading
4.6ft. on tide staff at Longbranch
26.2ft. below B.M.1
3.4 ft. on tide staff at Dupont Powder Wharf
29.7 ft. below B.M. 1

The height of mean high water above plane of reference is 12.8 feet
at Longbranch; 12.5 feet at Dupont.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

GEOGRAPHIC NAMES

Survey No. H6108

Name on Survey	Sources										No.
	A	B	C	D	E	F	G	H	I	J	
	On Chart No. 6460	On previous survey No. 77675	On U. S. quadrangle Maps	From local information	On local Maps	U. S. B.G. P. O. State or Map	Rand McNally Atlas	Orig. Wash. Geog. Names of Wash. H. Brad.	U. S. Geog. Names of Wash. H. Brad.		
<u>Drayton Passage</u> ✓	*	✓		✓				✓	✓		1
<u>Devils Head</u> ✓	*	✓						✓	✓		2
<u>Amsterdam Bay</u> ✓	*			✓							3
<u>Treble Point</u> ✓	*										4
<u>Anderson Island</u> ✓	*	✓		✓			✓	✓	✓		5
<u>Ora Bay</u> ✓	*	✓		✓				✓	✓		6
<u>Lyle Point</u> ✓	*	✓		✓			✓	✓	✓		7
<u>Nisqually Head</u> ✓	*	✓				✓		✓	✓		8
<u>Nisqually Flats</u> ✓	*	✓				✓		✓	✓		9
<u>Nisqually Reach</u> ✓	*	✓				✓		✓	✓		10
<u>Vega</u> ✓	*			✓			✓				11
<u>Gole Pt</u> ✓	*			✓				✓	✓		12
<u>Dupont Powder Wks. Whf.</u> ✓	*			✓							13
<u>Giant Powder Wks. Whf.</u> ✓	*			✓							14
<u>Thompson Cove</u> ✓				✓	✓						15
											16
											17
											18
											19
											20
											21
											22
											23
											24
											25
											26
											27

Names underlined and checked approved on 6/2/36
 by [Signature]

Remarks

Decisions

	Remarks	Decisions
1		
2		
3		
4		
5		
6	Gold Bay: Oro (not Ora) is gold in Sp.	<u>Oro</u>
7		
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Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H6108**

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

Number of positions on sheet	<i>2495</i>
Number of positions checked	<i>94</i>
Number of positions revised	<i>8</i>
Number of soundings recorded	<i>2408</i>
Number of soundings revised	<i>17</i>
Number of signals erroneously plotted or transferred	<i>—</i>

Date: *November 19, 1936.*

Verification by *Lionard A. McNamee* Time: *27 hours.*

Review by *R. J. Christman* Time: *12 ¹/₄ hrs*

HYDROGRAPHIC SURVEY NO. H6108

Smooth Sheet Yes

Boat Sheet 1

Sounding Records 8 Vols. _____

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes

Landmarks for Charts (Form 567) Yes

Statistics Yes

Approved by Chief of Party No

Recoverable Station Cards (Form 524) No

Special Chart for Lighthouse Service _____
(Circular Nov. 30, 1933)

Remarks _____

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY }
 DESCRIPTIVE REPORT } No. H **6108**
 PHOTOSTAT OF } No. T

{ received APR 16 1936
 { registered MAY 12 1936
 { verified
 { reviewed
 { approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE	Initial	Attention called to
20		
22		
24		
✓ 25	<i>SL</i>	<i>D. W page 3</i>
26		
30		
40		
62		
63		
82		
83		
88		
90		

RETURN TO

82	
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C. K. Green May 13 '36

Report on H-6108.

The records conform to the requirements of the General Instructions.

The topography for this survey H-6108 is covered by plane table surveys No T-6451 (1935), T-6453 (1935), T-6454 (1935), and T-6455 (1935), 1/10,000 scale.

All depth curves have been drawn except in the vicinity of Inequality Beach where additional work is to be done and between lat. $47^{\circ}07.1$ long $122^{\circ}39.9$ and lat $47^{\circ}08.4$ long. $122^{\circ}37.8$. In the latter place the soundings are insufficient in order to delineate the curves.*

Satisfactory junctions have been made with H-6104 and H-6106 on the north. There is no contemporaneous survey on the west.

* a short line of soundings should have been run at lat. $47-08.4$ long. $122-37.8$ to fully define the inshore depth curves.

Rye

Leonard A. McGowan verifier
November 24, 1936.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6108 (1935) FIELD NO. 14

Nisqually Reach, Puget Sound, Washington.
Surveyed in Sept.-Oct. 1935, Scale 1:10,000
Instructions dated March 29, 1934 (Explorer)

Hand Lead and Machine Soundings. 3 Point fixes on shore signals.

Chief of Party - Jack Senior
Surveyed by - L. C. Wilder
Protracted by - H. F. Garber
Soundings penciled by H. F. Garber
Verified and inked by Leonard A. McGann

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except that no separate "approval of records" by the chief of party was attached to the Descriptive Report (par. 174, Hydrographic Manual).

The Descriptive Report is comprehensive and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The plan, character and extent of development are in accordance with the instructions for the project except that a short line of soundings in the vicinity of lat. $47^{\circ}08.4'$, long. $122^{\circ}37.8'$ to better define the inshore depth curve, would have been desirable.

Some additional work in the vicinity of the black can buoy off Nisqually Flats was authorized by instructions dated Aug. 18, 1936, after preliminary examination of the survey and in advance of this review, (see Descr. Report page 1, last paragraph).

Accomplished.
For discussion,
see Rev. (par. 174)
of Add'l Wk. (1936)
attached to D.R.
of H-5710.
H.W.M. 1/26/37

3. Shoreline and Signals.

The shoreline is derived from plane table surveys T-6451, T-6453, T-6454 and T-6455 all of 1935.

Topographic signals are from the above plane table surveys, and there is one hydrographic signal (~~cut~~), cuts for the location of which are recorded in Vol. 6 of the sounding records.

4. Sounding Line Crossings.

No regular system of cross lines was run but soundings at crossings resulting from the development are in good agreement and soundings on adjacent lines are consistent.

5. Depth Curves

Within the area of the present survey the usual depth curves can be satisfactorily drawn except along the north edge of Nisqually Flats, where additional work is now being accomplished. (See par. 2-b of this review).

Accomplished. For discussion, see Rev. (par. 4) of Add'l Wk. attached to D.R. of H-5710. H.W.M. 1/26/37

6. Junction with Contemporary Surveys.

The junctions with H-6106 (1935) to the north and with H-6104 to the northeast are satisfactory.

The 1936 surveys to the west have not been received in the office.

7. Comparison with Prior Surveys.

H-1426-b (1878-9)

This survey on a scale of 1:20,000 covers the area of the present survey with widely spaced lines. A note on the sheet states "To refer soundings on this sheet (H-1426-b) to plane of mean lower low water, add 3.2 ft.". Depths on the two surveys are in good agreement. Differences in details are generally due to the closer development on the present survey.

Because of the larger scale and closer development as well as the more recent date of the present survey, H-6108 (1935) should supersede the above survey for charting purposes.

8. Comparison with Chart 6460 (New Print dated July 20, 1936.)

a. Hydrography

Within the area covered the chart is based on the survey discussed in the foregoing paragraph and contains no other information that needs discussion in this review.

b. Aids to Navigation.

The charted position of buoy C 1 (Lat 47°06.7', long. 122°41.9') is in substantial agreement with the position given by the present survey. (See Descr. Rep. page 4 under "Discrepancies"). This is the only aid within the area of the present survey.

9. Field Plotting.

The field plotting was satisfactory.

10. Additional Field Work Recommended.

The survey is satisfactory. The additional work at the north edge of Nisqually Flats as planned by the field party was authorized

Accomplished. For discussion, see Rev. (par. 4) of Add'l Wk. (1936) attached to D.R. of H-5710. H.W.M. 1/26/37

by instructions dated Aug. 18, 1936 (see par. 2 of this review). ✓

11. Superseding Old Surveys.

Within the area covered, the present survey supersedes the following survey for charting purposes:

H-1426 b (1878-9) in part.

12. Reviewed by R. J. Christman, Dec. 1, 1936.

Inspected by A. L. Shalowitz

Examined and approved:

C. K. Green, *C. K. Green.*
Chief, Section of Field Records

Fred. R. Peacock
Chief, Section of Field Work

L. O. Robert.
Chief, Division of Charts

Stude
Chief, Division of H. & T.

Applied to Cht. 6460 June 23, 1938 K.P.