6474

Original

Form 504
Rev. April 1935

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

~~Topographic~~ Hydrographic } Sheet No. 6474

State Washington

LOCALITY

Saratoga Passage

Puget Sound

1939

CHIEF OF PARTY

Robert W. Knox

U. S. GOVERNMENT PRINTING OFFICE 102221

6474

Form 537
Ed. Sept., 1929

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. 10

REGISTER NO. 6474

State Washington

General locality Puget Sound

Locality Saratoga Passage

Scale 1:10,000 Date of survey June - July, 1939

Vessel Steamer Explorer

Chief of Party Robert W. Knox

Surveyed by Earle A. Deily, Robert W. Knox, Harold J. Oliver

Protracted by Earle A. Deily

Soundings penciled by Earle A. Deily

Soundings in fathoms XXXX

Plane of reference mean lower low water

Subdivision of wire dragged areas by

Inked by R. H. Carstens

Verified by R. H. Carstens

Instructions dated April 12, 1939

Remarks:

U. S. GOVERNMENT PRINTING OFFICE: 1939

DESCRIPTIVE REPORT

HYDROGRAPHIC SHEET H-6474 (1939)

SARATOGA PASSAGE

PUGET SOUND

WASHINGTON

INSTRUCTIONS:- Thehydrography on sheet H- 6474 (1939) constitutes a part of Project H T -233 executed under instructions dated April 12, 1939 and later amended by the Director's letter of June 24, 1939.

LIMITS AND SCALE:- The scale of this sheet is 1:10,000.

The hydrography covers the northern part of Saratoga Passage and a portion of the southern end of Skagit Bay. The westerly limit, delineated by the Washington Office, follows a line drawn northward from Demock Point, Camano Island to latitude 48° 16'.1 and thence westward to a line drawn southward from Polnell Point, Whidbey Island. The hydrography was carried slightly beyond this east-west line in order to extend into deep water.

The easterly limit follows a line, also delineated by the Washington Office, extending slightly east of north from Brown Point, Camano Island.

On the north a junction was effected with sheet H-6475. (1939)

The limit lines have been drawn on both the boat sheet and on the smooth sheet.

METHODS:- Standard Coast Survey methods were used. Soundings were taken with the hand lead except for a few in the deep pocket at the western limit. Here machine sounding was resorted to.

The spacing of lines was that specified in the instructions. The instruction for 50-meter spacing inside the 2-fathom curve except on flats covered by less than 8 feet at ordinary high water was amended by the letter of the Director dated June 24,1939 so that this 50-meter spacing need not be extended over flats covered by one foot or less at mean lower low water and that a wider spacing was permissable over the flats. On this sheet the 50-meter spacing was widened to a maximum of approximately 80 meters.

The hydrography was begun by Lieutenant Robert W. Knox, continued by Lieutenant (j.g.) Harold J. Oliver, and completed by Lieutenant Earle A. Deily under whose direction the work was approximately 80 percent accomplished. On the greater number of days work was begun on sheet H 6475, run to the southern limit of that sheet, continued on sheet H 6474, and then later in the day resumed on sheet H 6475.

The hydrography was begun on the brown boat sheet and completed on the white. The first was abandoned because of a desire to change the limits. The soundings on the brown sheet were transferred to the white so that there would be no unnecessary overlap in field work.

In the review of sheet H 6474 it will be noted that there are changes in length of distance interval between fixes without notations of a change in launch speed having been made in the record book. Where such changes have occurred the plotting of the fixes has been checked. In the area of this survey strong and irregular currents were encountered without, in many cases, any surface warning. Such swirling currents, or changes in current, were almost invariably encountered when passing into the shoal areas from the deep or vice versa, and when crossing the narrow and winding channels which traverse the banks; the launch then could be seen to jump ahead, fall off sideways, or slow down, depending on the direction of the new current strength encountered. How frequent this occurred is evidenced by the lack of straight lines in certain areas. When such change of current could be predicted or was noted an attempt was made to get a fix as soon as possible in order to better control the path of the launch and the subsequent spacing of soundings.

CONTROL:- Triangulation stations and topographic signals were used in obtaining sextant fixes.

GENERAL CHARACTERISTICS OF SHORELINE AND BOTTOM:- The Camano Island shore rises gently from the beach. Shingle beach, somewhat interspersed with sand extends eastward from Demock Point to triangulation station Utsaladdy 2,1934; it becomes somewhat more sandy to station Pith; thence shingle again to the eastern limit.

Hydrography close inshore was done at high tide, and as the detached boulders and rocks were located in most cases by direct rod readings by the topographer no attempt was made to further locate these features. The scattered boulders offshore between signals Tall and Brown are glacial and the remains of the washing away of the bluff in that vicinity.

The Whidbey Island shore in places shows high clay bluffs. The shore is again shingle with numerous scattered boulders, the remains of washed away glacial drift. These boulders were also located by the topographer and therefore again no further time was spent in locating each and every one. These rocks were not placed on the boat sheet and it was understood that all such rocky areas were delineated by the topographer. Had it been known that the foul area surrounding Polnell Point had not been rodded-in by the topographer at low water more work would have been done there by the hydrographic party in an attempt to more adequately show the outer edge of the foul water and to definitely check the position of the individual rocks shown on Chart 6450. One rock, bare ~~1½ feet~~, mean lower low water, 3 rd. sounding after position 60 ad , is plotted on the sheet. Shoreward of here the area is foul as shown on both the boat and smooth sheets.

P-W8-16.29
2/22-23.4
Present survey satisfactory without additions. Par. 5b, review.

The bottom, except in the few rock strewn areas close to the shore where there is a notation of "rocky ", is almost uniformly "mud ". Some few bottom characteristics of " sand " were recorded.

The sides of the channel proper fall off sharply, even from the alluvial fan formed by the outfall from the Skagit River.

Off Polnell Point the 10-fathom curve is distant about 0.4 mile.

On the flats the bottom is extremely bumpy and irregular and interspersed with narrow channels of slightly deeper water.

TIDES:- A tide gage, located about 2 miles northeastward of Polnell Point, was operated during the entire time work was in progress in this area. The tide reducers for the hydrography in this area were taken from the records of this gage. The tide curves, drawn on cross section paper, are submitted with the other curves covering the hydrography executed under this project.

CURRENTS:- The tidal flow follows the axis of the deep main channel on the flood, fanning out over the flats toward the mouths of the Skagit River with considerable strength.

At the ebb the main flow is deflected to the south-southeast against the edge of the flats formed by the deposits of the Skagit River. Here, at the edge of the flats, the currents were extremely irregular because of the junction with the flow from the Skagit River and regular sounding lines were hard to run. From thence, again deflected, the current flows west-southwestward. Divided somewhat by the slight shoaling south of triangulation station Nell 1939 , a portion rushes with force toward the shore and forms a strong back eddy as it sweeps around the Polnell Point shore. The main stream, however, has continued southwestward direct for Saratoga

Passage.

Ripples and a distinct difference in color mark the edge of deep water.

The tidal currents in the main channel attain an estimated velocity of from 2 to 3 knots. A current station was occupied in this area during the course of the seasons work.

DEPTH CURVES:- The usual depth curves have been drawn on the sheet. On meridian 122° 29′ northward of latitude 48° 17′ they were hard to define by the hydrography due to the fact that they lie extremely close together and strong and variable currents were present making the task of getting on line and on position extremely difficult. At one place a short line of additional soundings might have been of value.

Satisfactory.

DISCREPANCIES AND CROSSINGS:- Crossings in general were quite good. Attention is invited to the following:

1- In the shoal areas there are discrepancies of from 1 to 2 feet in closely adjacent and crossing soundings. These have not been listed. In this respect it must be born in mind that the alluvial shoal areas show an extremely bumpy bottom.contour.

2- Latitude 48° 17′.5, longitude 122° 29′.3, positions 6 to 8 g. - This diagonally crossing line fails to agree with the others by difference of as much as two fathoms. These disagreeing soundings were not plotted. The position of the line was investigated by the hydrographer but no shift in position was possible. The north and south lines were run subsequently and show a uniform change in depth. This discrepancy was noted as soon as the soundings were put on the boat sheet and the later lines were run somewhat closer together than would have been done normally in order to disprove the soundings on the diagonal line. The only possible explanation is that the comparatively inexperienced leadsman, meeting the sudden drop off the edge of the shoal area, failed to read the leadline correctly.

sdgs left unlinked as they disagree with numerous other lines. RMC

Soundings between pos. 6 and 8g obviously in error. Rejected. J.A.M.

3- Latitude 48° 17′.3, longitude 122° 29′.1 — Crossing —positions 19 d to 20 d, first sounding between , 4 5/6 fathoms; positions 40 ac to 41 ac, second sounding between, 2 4/6 fathoms. The shoaler (2 4/6 fathom) sounding has been plotted. This occurs at the edge of a steep slope, when the launch running east and west crossed into the deep. At such times a change in speed usually occurred, the deep sounding is probably slightly displaced causing the apparent discrepancy.

pos 19d was plotted in error.

Crossing OK. 2½ on 19d falls on 2½ at 40-41ac.

4- Latitude 48° 17'.4, longitude 122° 29'.2 —— The first sounding after position 10 e falls (6½ fathoms) inside the second sounding (5 2/6 fathoms) after position 43 ac. This is again probably due to the soundings being on the edge of the steep slope and the fact that the probable path of the launch between 43 ac and 44 ac was curved line. It is so shown on the sheet.

6½ plotted.

5- Latitude 48° 17'.4, longitude 122° 29'.1 -- Soundings between positions 36 e and 37 e, and positions 8 k and 9 k. There is a sounding of 5 1/6 fathoms on 4 fathoms.It is believed that the deeper sounding is the better as the bank is steep and the launch again probably changed s speed due to a current change experienced in crossing the edge of the bank and therefore the interval to the deeper sounding would be increased thus placing the 4 fathoms a little to the eastward of where shown.

steep slope accounts for discrepancy EHC

6- Off triangulation station Frost 1939 , distant 65 meters —— The sounding of ½ fathom, sounding immediately before position 12 q, falls nearly on a rock which was transferred onto the hydrographic sheet. On the topographic sheet this rock is shown as " bares 3 feet at mean lower low water ". The hydrography was done at high water, 8-foot tide reducer, and the sounding was undoubtedly just off the rock. The topographer reports that this boulder was located by a direct rod reading from the nearby triangulation station.

lat. 48°17 + long. 122° 30 + Satisfactory.

7- Latitude 48° 16'.9, longitude 122° 31'.7 —— The soundings between positions 33 q and 35 q are in an extremely rocky area which could only be entered at high tide. The soundings are quite possible. They were taken at a 7-foot tide when the bottom was not visible. The topographer reports locating the rocks in this area by direct rod readings.

8- Latitude 48° 15'.7, longitude 122° 30'.1 , positions 85 w to 86 w —— The crossing of this line with 182 t to 183 t gives a sounding of 5 2/6 fathoms between 5~~5/6~~ and 6~~4/6~~ fathoms. The shoaler sounding should be retained as it is little different from the soundings immediately to the northward. The bottom is probably bumpy. The crossing at 86 w is perfect.

slopes steep

9- Latitude 48° 15'.7, longitude 122° 28'.2—— The third sounding after position 60 y is 1 1/6 fathoms which falls just outside a topographically located rock ~~covered at high~~ water. The hydrography was done at a 7-foot tide and the rock in question was not seen. The sounding is quite possible. The rocks in this area were located by the topographer who made a special effort to chart them at extreme low water when all were visible. No time was therefore spent by the hydrographic party in relocating these rocks.

10- Latitude 48° 16'.4, longitude 122° 27'.9. There may seem some discrepancy in depth where positions 65y to 67 y fall almost on positions 70 x to 72 x. The "y" line , however, is slightly to the south; the bank into the channel falls off quite steeply at this place.

Y-day line favored Depths of 1 fm.

COMPARISON WITH PREVIOUS SURVEYS :-

Sheet H 1885 --- In general there is good agreement between the old and the present surveys. At places eastward of Polnell Point discrepancies of 1/6 to 3/4 fathoms are noted. There were indications of the bank southward of triangulation station Nell 1959 which was found in the present survey but little developemnt of that area is shown in the old work. There are also some few indications of minor shoaling and deepening along the Whidbey Island shore.

The greatest changes noted are in that channel which parallels the Camano Island shore eastward of Utsaladdy Beach. After passing northward oflongitude 122° 29'the depths in this channel were almost uniformly 1 fathom less than previously shown.

The bare spots previously located inlatitude 48° 16'.8, longitude 122° 28'.5 now show depths of 1/2 fathom or more. Depths in this area probably change from time to time due to freshets from the Skagit River.

The rock strewn area along the Camano Island shore between latitude 48° 15'.5 and latitude 48° 16'.2 is only indicated on the previous work and on the chart. This has been adequately developed by the new topography.

Sheet H 2050 ---- Agreement with this sheet is, in general, quite good. Such minor difference as have been noted are on the flats , an area of bumpy and somewhat changeable bottom.

ANCHORAGES: - Small pleasure craft plying the inside passage find anchorage, protected from westerly weather, under the lee of Polnell Point in 7 to 8 fathoms, mud bottom. The strong current, however, makes the holding somewhat insecure.

Better anchorage can be secured in 3 to 6 fathoms, mud bottom, northeastward of Utsaladdy Beach. Currents here are also quite strong. There is a small float landing and general store at Utsaladdy Beach.

CHANNELS :- The main channel which passes from Saratoga Passage northeastward into Skagit Bay has a controlling depth of 9 3/4 fathoms. Between the 6-fathom curves the channel is, at its narrowest part, about 0.6 mile wide.

The small channels leading across the flats toward the mouth of the Skagit River are narrow , winding, and shoal toward their eastern end. Comparison with the 1890 survey (H 2050) shows that these channels are however, comparatively stable in position.

The main channel to the Skagit River follows the Camano Island shore. It shoals considerably toward Brown Point off which the controlling depth is 5/6 fathom. As this channel is narrow and made dangerous by rocks along its eastern edge, local knowledge is advisable.

Local vessels making passage toward the Skagit River mouth cross the flats at high tide on a northeasterly course making for the buoys off Brown Point.

AIDS TO NAVIGATION:- The only aids to navigation on the sheet are the two red spar buoys of Brown Point. The westerly buoy marks the north edge of the deeper water across the flats. The easterly buoy, however, does not mark t e best water as shoals which bare at mean lower low water lie northward of it.

DANGERS :- The main channel is free of dangers. Polnell Point is fringed with foul ground and should be given a good berth.

The offlying rocks between Utsaladdy and Brown Point confine the channel in that area. These rocks cannot be seen except when bare due to the murky water.

JUNCTIONS:- A satisfactory junction was made with sheet H 6475 to the northward. To the southwestward the hydrography was carried out into deep water and beyond the limits of the project. Comparison with sheet 1885 shows a satisfactory junction.

Earle A. Deily

Earle A. Deily
Lieutenant, U.S.C. & G. Survey.

TIDAL NOTE

SHEET H - 6474

The soundings on sheet H 6474 were reduced from the data obtained at the Polnell Point Tide Station.

Latitude	48° 17'.4
Longitude	122° 31'.0
M.L.L.W. on staff	5.8 feet
Length of Series	2 months
Highest tide	17.9 feet
Lowest tide	2.9 feet
Date of highest tide	June 20, 21, 22, 1939 July 18, 1939
Date of lowest tide	July 16, 1939

STATISTICS

Statute miles of sounding lines	397.7
Number of soundings	14,513
Number of positions	3,623
Area, square statute miles	11.8

PLACE NAMES

Name	Authority	Recommendation
Brown Point	T -6684 a	new name, add
Camano Island	T -6684 a Charts 6300,6450	retain
Demock Point	T -6684 a Charts 6300,6450	retain
Maple Grove Beach	T -6684 a	new name, add
Saratoga Passage	T -6684 a Charts 6300,6450	retain
Skagit Bay	T -6684 a Charts 6300,6450	retain
Utsaladdy	T -6684 a	new location ,add
Utsaladdy Beach	T -6684 a	new name, add
Whidbey Island	T -6684 a Charts 6300,6450	retain
Polnell Point	T -6684 Charts 6300,6450	retain

Approved and forwarded

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. 6474 (1939)

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

Number of positions on sheet	3623
Number of positions checked	123
Number of positions revised	26
Number of soundings recorded	14513
Number of soundings revised	37
Number of soundings erroneously spaced	16
Number of signals erroneously plotted or transferred	0

Date: May 4, 1940

Verification by R.H. Carstens Time: 126 hr

Review by J.A. McCormick 6/14/40 Time: 7 hr.

2629

HYDROGRAPHIC SURVEY NO. 6474 (1939)

Smooth Sheet Yes

Boat Sheet 2

Records; Sounding 11 Vols., Wire Drag ___ Vols., Bomb ___ Vols.

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes

Landmarks for Charts (Form 567) No

Statistics Yes

Approved by Chief of Party Yes

Recoverable Station Cards (Form 524) No

Special Chart for Lighthouse Service No
(Circular Nov.30, 1933)

Hydrography: Total Days 30 ; Last Date Aug. 1, 1939

Remarks

2776

	Remarks.	Decisions
1		482224
2		483224
3		481 224
4		482224
5		482225
6		
7		482226
8		482225
9		481 225
10		482225
11		482224
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
M 234		

GEOGRAPHIC NAMES

Survey No. 6474

Name on Survey	A. On Chart No.	B. On previous survey No.	C. On U. S. quadrangle Maps	D. From local information	E. On local Maps	F. P. O. Guide or Map	G. Rand McNally Atlas	H. U. S. Light List	K.	
Brown Point										1
Skagit Bay										2
Camano Island										3
Utsaladdy Beach										4
Maple Grove Beach										5
Demock Point										6
Whidbey Island										7
Polnell Point										8
Saratoga Passage										9
Demock Point										10
Ut Saladdy										11
										12
										13
										14
										15
										16
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										18
										19
										20
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										22
										23
										24
										25
										26
										27
										M 234

Names underlined in red approved by L. Heck on 6/25/40

FORM M-238

✓ RAE

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY
DESCRIPTIVE REPORT
PHOTOSTAT OF
} No. H 6474
No. T

{ received March 20, 1940
registered April 3, 1940
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	✓	HBC	Pages 2, 3, 4, 6 and 7
26			
30	✓ RAE		Pages 3 and 4
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	T. B. Reed

✓ JJSOR

RAC
#12.

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Rev. June 1937

TIDE NOTE FOR HYDROGRAPHIC SHEET

April 8, 1940

Division of Hydrography and Topography:

✓ Division of Charts: Attention: Mr. H. R. Edmonston

Plane of reference approved in
11 volumes of sounding records for

HYDROGRAPHIC SHEET 6474

Locality Saratoga Passage, Puget Sound, Washington

Chief of Party: R. W. Knox in 1939
Plane of reference is mean lower low water reading
5.8 ft. on tide staff at Polnell Point
14.1 ft. below B. M. 1

Height of mean high water above plane of reference is 10.6 feet.

Condition of records satisfactory except as noted below:

Harm
Chief, Division of Tides and Currents.

U. S. GOVERNMENT PRINTING OFFICE 154327

Verifiers Report of H6474 (1939)

1. The signals and shoreline originate with T-6684a(1939) and T-6685a(1939)
2. The usual depth curves could be satisfactorily drawn
3. Except for the crossline 6-8 @ φ 48-17.5 λ 122-29.3 (see descriptive report) the sounding line crossings were satisfactory Item 2, page 4.
4. A butt junction was made with H-1885(1888) a portion of which this survey supersedes. Other surveys to the north and east have not as yet been received. Par. 4, review.
5. The condition of the soundings records was satisfactory
6. The protracting was satisfactory
7. The field plotting of soundings was satisfactory.

Respectfully submitted
R.H. Carstens

5/14/40

DIVISION OF CHARTS

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6474 (1939) FIELD NO. 10

Washington, Puget Sound, Saratoga Passage
Surveyed in June - July 1939, Scale 1:10,000
Instructions dated April 12, 1939 (EXPLORER)

Soundings:
Hand Lead and Machine

Control:
Three point fixes on shore signals.

Chief of Party - R. W. Knox.
Surveyed by - R. W. Knox, E. A. Deily, H. J. Oliver.
Protracted by - E. A. Deily.
Soundings plotted by - E. A. Deily.
Verified and inked by - R. H. Carstens.
Reviewed by - J. A. McCormick, June 13, 1940.
Inspected by - H. R. Edmonston.

1. Shoreline and Signals.

Shoreline and topographic signals are from T-6684a and T-6685a of 1939.

2. Depth Curves.

Satisfactory.

3. Sounding Line Crossings.

Several minor discrepancies at crossings are noted in the descriptive report, pages 4 to 6. Agreement, as a whole, is very satisfactory.

4. Junctions with Contemporary Surveys.

The junction with H-6475 (1939) on the north will be considered in the review of that survey. New surveys are not contemplated on the southwest but the overlap with H-1885 (1888) shows satisfactory continuity of old to new hydrography. Surveys of the shoal area on the east are being deferred until air photographic surveys are made of the area.

5. Comparison with Prior Surveys.

a. H-405 (1853) 1:212,000.

This reconnaissance survey shows approximately 25 soundings in the deep water portion of the

present work. Agreement of these depths with those on the present survey is fair to poor. The old survey is superseded in the common area.

b. H-1885 (1888), 1:20,000; H-2050 (1890) 1:20,000.

The combined area of these two surveys includes that covered by the present survey. As stated in the descriptive report, page 6, most of the differences between old and new surveys are on the flats to the eastward where present depths average 1 to 2 feet deeper than those of 1888-1890. Differences over the entire common area are about evenly divided between shoaling and deepening. Rocks awash charted off Polnell Point (lat. 48°16' long. 122°33') are from generalized information on H-1885. The single rock and the "foul" legends on the present survey adequately convey the same information. Extensive piling (charted) in lat. 48°15.1', long. 122°29.0', on H-1885 undoubtedly has been removed or destroyed, otherwise more piles than the few located close inshore on T-6684a (1939) would have been encountered by the hydrographic party during its close development in the vicinity. H-1885 and H-2050 are superseded in the area covered by the present survey.

6. Comparison with Chart 6380 (New Print of July 20, 1939). Chart 6450 (New Print of Sept. 1, 1939).

a. Hydrography.

Within the area of the present survey, charted hydrography is from surveys discussed in the foregoing paragraphs.

b. Aids to Navigation.

Floating aids at the entrance to Skagit River are not charted but a note on Chart 6450 states that twelve red spars mark the south side of the channel as of August, 1935. The two red spars shown in lat. 48°16', long. 122°27' are on the wrong side of the channel and should not be charted.

7. Condition of Survey.

Satisfactory.

8. Compliance with Instructions for the Project.

Satisfactory.

9. Additional Field Work Recommended.

None.

10. Superseded Surveys.

H-405 in part
H-1885 in part
H-2050 in part

Examined and approved:

T. B. Reed,
Chief, Section of Field Records.

Chief, Division of Charts.

Chief, Section of FieldWork.

Chief, Division of H.& T.

Applied to ch. 7000 - Aug. 1940. D.C.P.

Applied to ch. 6450 - Feb. 1941 S.R.
" " " 6300 Mar. " "
" " " 6380 " " "
" " new chan. 6404 June 12, 1943. J.K.S.