9410

Diag. Cht. No. 6460-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC

Field No. DA-5-1-74

Office No. H-9410

LOCALITY

State WASHINGTON

General Locality PUGET SOUND

Locality NORTHWEST PORTION OF COMMENCEMENT BAY

1974

CHIEF OF PARTY
M. H. FLEMING

LIBRARY & ARCHIVES

DATE 9-23-76

☆ U.S. GOV. PRINTING OFFICE: 1975—668-353

9410

Charts
6407
16401
6460
185SC-C4B limit 647

FORM C&GS-537 (5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

REGISTER NO. H-9410

HYDROGRAPHIC TITLE SHEET

FIELD NO. DA-5-1-74

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State WASHINGTON

General locality Puget Sound

Locality Northwest Portion of Commencement Bay, ~~Tacoma Harbor~~

Scale 1:5000 Date of survey March 25 - April 25, ~~March-April~~ 1974

Instructions dated 1, 14, 18 March 1974 Project No. OPR-412-DA-74

Vessel NOAA Ship DAVIDSON CSS-31, Launch 3131 and 3132

Chief of party Michael H. Fleming, CDR, NOAA, CMDG

Surveyed by Ens.'s West, Kapler, Oswald, Mercer, Sarb and Ship's Personnel

Soundings taken by echo sounder, hand lead, pole Ross S/N 1048, 1053 DA 723 S/N 533, 926

Graphic record scaled by Ship's Personnel

Graphic record checked by Ship's Personnel

Positions verified by ~~Protracted by~~ James L. Stringham Automated plot by PMC Xynetics Plotter

Soundings ~~penciled~~ verified by James L. Stringham

Soundings in ~~fathoms~~ feet at MLW MLLW

REMARKS: Survey time zone 000° GMT, Mean Survey Longitude 122° 26' W

This boat sheet is complete as defined by the approved boat sheet layout. There were no descriptive reports available on prior field work. (See Comparison with Prior Surveys - Sec. K)

Applied to stds 2-10-77 ABB

USCOMM-DC 37009-P66

A. PROJECT

This survey was completed under Project Instructions OPR-412-DA-74, Tacoma Harbor, Washington, dated 1 March, 1974, with the following changes:

Change No. 1: Supplement to Instructions, dated 14 March, 1974.

Change No. 3: Supplement to Instructions, dated 18 March, 1974.

B. AREA SURVEYED

The survey area is Commencement Bay, Tacoma Harbor, Washington. The survey area extends east from Point Defiance to the middle of Commencement Bay and south to Ruston. The survey was conducted during the months of March ~~and~~ April, 1974.

25 — 25

C. SOUNDING VESSEL

Three vessels were used on this survey using the following color codes:

VESSEL	COLOR
NOAA Ship DAVIDSON	Brown
WZ 3039 DA-1	Red
WZ 3040 DA-2	Blue

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

The following fathometers were used to conduct this survey:

VESSEL	TYPE	SERIAL NO.
DAVIDSON	Raytheon DE-723	1286
WZ3039 DA-1	Ross Fineline 5000	1048
WZ3040 DA-2	Ross Fineline 5000	1053
	Raytheon DE-723	926
	Raytheon DE-723	566

DAVIDSON used its fathometer for the bottom samples of this survey. DA-1 used the Ross 5000 exclusively in depths ranging from 2 to 570 feet.

In one area 200 meters off of signal 100, steep slopes were encountered. The Ross required numerous scale changes and as a result many soundings were missed. Also, the Ross system was found to be

incompatible for use with the Aircraft ~~Systems~~ Standards, Inc., Logger in the Auto-Vis mode. The Raytheon fathometers were then installed in DA-2 (days 098 and 099) in an attempt to obtain improved results. For further discussion see Section P, Miscellaneous.

Echo sounder correctors were determined from twice-daily bar checks and two salinity/temperature (MARTEK) casts. See report on "Correctors to Echo Sounders."

TRA correctors were not applied to inked soundings on field smooth sounding overlay.

Refer to "Correctors to Echo Sounders" for abstracts and print-outs of TRA/TCI and velocity correctors.

E. BOAT SHEETS

The boat sheets will be constructed and plotted by Processing Division, Pacific Marine Center, Seattle, Washington.

F. STATION CONTROL

Triangulation

Existing triangulation stations were recovered and additional stations established to second order precision.

Photohydro Signals

The shoreline parallels the flight line in many instances and it was unfeasible to use the "Radial Plot Method" for the compilation of photohydro signals. Instead, we used man-made objects already compiled on the Shoreline Manuscripts (piles, building and pier corners, etc.) and scaled their latitude and longitude directly. The objects selected from the Shoreline Manuscripts were verified on the photos with a mirror stereoscope. These "chosen" objects were pricked and inked on the office photos and Shoreline Manuscripts. Many of these signals have been checked by triangulation methods. Refer to Appendix Signal List.

Datum

The North American 1927 Datum was used for this survey.

G. POSITION CONTROL

The Motorola Mini Ranger III system was used for electronic control,

having an equivalent frequency of 1498.35 KHz. Four transponders were used in five positions:

NAME	SIGNAL NO.	LATITUDE	LONGITUDE
HYLEBOS	007	N 47° 17' 14.522"	122° 24' 41.679" W
SON	102	N 47° 17' 40.943"	122° 29' 47.809" W
ID	025	N 47° 16' 03.074"	122° 26' 38.195" W
BROWN PT	015	N 47° 18' 21.917"	122° 26' 34.915" W
DAV	023	N 47° 19' 51.413"	122° 29' 34.817" W

Calibrations were made twice daily while tied alongside fixed calibration points. The calibration points were pier faces at Cummings-026 and Blair-026 (Port Industrical Waterway Light). No sextant fixes were taken. Refer to "Special Report on Adequacy of Mini Ranger III OPR-412-DA-74" and daily "Electronic Calibration Abstract."

No correctors were applied to plotted positions.

Visual positions used three-point sextant fixes.

H. SHORELINE

The shoreline for this survey was derived from the following shoreline manuscripts:

TP-00728
TP-00730
TP-00731

The shoreline was verified by Field Edit methods. See Field Edit Report OPR-412-DA-74.

The low-water line was defined except where natural or man-made obstructions proved prohibitive.

I. CROSS LINES

Cross lines represent 6.2% of total mileage. Cross line soundings agreed within 1-2 feet of the main scheme lines. In all cases the sounding vessel and equipment were the same for the cross and main scheme lines.

J. JUNCTIONS

The survey area junctioned with the contemporary surveys H-9411,

1:5000, March 1974, and H-9412, 1:5000, March 1974. Agreement ranged from 1-3 feet in water 500 feet deep to 0-1 feet in the shoaler waters.

The survey junctions are adequate.

K. COMPARISON WITH PRIOR SURVEYS

OPR-412-DA-74 had no formal Pre-survey Review. A Chart Deficiency Investigation was supplied. Time was not available to investigate the items listed on the Investigation of Reported Chart Deficiencies, Puget Sound, Washington, dated 7 March 1974, all of which are not within the survey area. 18

This survey compares quite well with H-4752 conducted in 1928 and H-5932 conducted in 1935.

Differences in the near shore depths range from 0-3 feet. Deep water depths differ 10-30 feet, this survey showing shoaler depths. The deep water discrepancy may be attributed to different survey methods and equipment and to the accumulation of silt deposits during the 38 years since the last survey.

L. COMPARISON WITH CHART

The largest scale chart in the survey is C&GS 6407, 12th Edition, dated January 27, 1973, scale 1:15000.

Survey data compares as noted in Comparison with Prior Surveys.

M. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede prior surveys for charting.

All fathogram field survey records were scanned and checked for peaks and deeps with appropriate changes made to the original records.

N. AIDS TO NAVIGATION

Refer to Appendix for listing aids.

Non-floating aids and landmarks were not investigated or verified under this project. Those aids had been previously located by PMC Field Party in 1973, with the exception of Brown Pt. Light located in 1935. It is recommended that the "Yacht Club Flag Pole" be charted at N 47° 18' 0811, 122° 30' 0859 W. (See "Horizontal Note" OPR-412-DA-74)

See verifiers report item II Hydrography

O. STATISTICS

Total number of positions	1951
Sounding Lines	156.4 n.m.
Survey Area	11.1 sq.m.

P. MISCELLANEOUS

Logging of Visual Hydrography Data

During this survey the Aircraft ~~Systems~~ Standards, Inc., logging system was found incapable of logging visual hydrographic data on a "real time" basis. All fix data was logged one fix late and recorded in sounding volumes. To overcome the "real time" problem three methods were used:

Method 1

This method used the ASI logging system and the Ross 5000 Fineline fathometer.

The logger was set in the Auto-Vis mode. The fix was taken. All data was recorded in a sounding volume and keyed onto the keyboard display. Just prior to the next fix the recorder would switch the input mode from Remote to keyboard. On the fix the system would print the previous fix data without a sounding. The recorder would switch back to remote input (soundings would be taken automatically), record the fix data, key that data onto the keyboard display and the cycle would continue.

The first method worked reasonably well except where steep bottom slopes were encountered. The Ross fathometer trace was not a good check on the digitizer. Numerous scale changes resulted in missed soundings, and it was decided to use the Raytheon 723 and Method 2.

Method 2

The logger is set at the INTERVAL mode. This allows the recorder to manually, rather than remotely, key the sounding interval. The Raytheon paper is scaled with fifteen-second intervals and served as the time basis with on-line comparison to the logger clock. The clock and fathometer were synchronized at the start of each line. This method was used on days 098 and 099.

The Raytheon 723 produced an unacceptable trace and the Ross 5000 was reinstalled.

The Electronic Division of the Pacific Marine Center was able to develop a modification of a logger circuit card and spawned Method 3.

Method 3

This method is similar to Method 1 except that the new card allowed the logger to remain in Remote input and read the keyboard display without loss of sounding. The fix data was logged the same as Method 1.

Summary

Method 3 proved the most productive and remains the visual data logging method. The method, however, requires further processing of data as prescribed by Lt.Cdr. Maki's letter, dated 6 May 1974.

Duplication

The following positions were inadvertently duplicated with the exception of those noted as "no position number." Refer to "Abstract of Positions."

DAY	POSITION	LAUNCH
091	0007-0074	DA-2
092	0075-0194	DA-2
093	0200-0276	DA-2
094	0277-0363	DA-2
098	0364-0467	DA-2
099	0465-0514	DA-2
101	1000-1020	DAVIDSON*
114	1064-1069	DAVIDSON*
116	1070-1076	DAVIDSON*

* Bottom sample positions

On day 095 hydro was run that duplicated the work done on day 091. This duplicated data has not been smoothed or otherwise processed. The raw data will be sent with this report.

R. REFERENCES TO REPORTS

Title	Date Submitted
Special Report on Adequacy of Mini Ranger III OPR-412-DA-74	June 28, 1974
Field Edit Report OPR-412-DA-74	July 3, 1974
Corrections to Echo Sounders Report OPR-412-DA-74	July 5, 1974

Submitted by,

James D. Sarb

James D Sarb
ENS, NOAA

Approved by,

Michael H Fleming
CDR, NOAA
Commanding Officer
NOAA SHIP DAVIDSON

STA	LATITUDE	LONGITUDE	CRT	ELEV	F. KHZ	TYPE/NAME	SOURCE
001	47° 17' 0994	122° 29' 0853	139	20.0		Bluff, 1935 r. 1973	*
002	47° 15' 1088	122° 22' 0340	139	40.0		Tacoma, Kaiser Aluminum Plant Stack, 1973	*
003	47° 15' 1316	122° 26' 0145	139	8.0		Tacoma Harbor, City Waterway Lt. 1973	*
004	47° 16' 0461	122° 25' 0681	139	3.0		Puyallup Waterway Jetty Lt. 1, 1973	*
005	47° 16' 0446	122° 25' 0556	139	4.8		Milwaukee Waterway Shoal Lt. 1973	*
006	47° 16' 1303	122° 24' 1113	139	5.0		Port-Industrial Waterway Lt. 1973	*
007	47° 17' 0448	122° 24' 0876	139	5.0	149835	Hylebos Waterway Lt. 1973	*
008	47° 15' 1348	122° 25' 1247	139	10.0		Tacoma, Puget Sound Plywood Black Stk 1973	*
009	47° 17' 1526	122° 30' 0456	139	20.0		Ruston Am. Smelting & Refining Co. Stack 1954	1-1639
011	47° 16' 1378	122° 28' 0616	139	25.0		Pug, 1919	1-87
015	47° 18' 0677	122° 26' 0733	139	15.0	149835	Brown Pt. L.H., 1935	1-213
018	47° 17' 1797	122° 26' 0517	139	4.0		Pole (1974)	**
019	47° 15' 1676	122° 26' 0854	139	40.0		Cliff, 1919 r. 1933	1-85
020	47° 15' 1526	122° 26' 0958	139	80.0		First Presbyterian Church Spire 1927	1-88
021	47° 16' 1458	122° 24' 0230	139	40.0		Tacoma, Chemical Plant, Gold Dome 1935	1-243
023	47° 19' 1588	122° 29' 0731	139	3.9	149835	DAV (1974)	**

STA	LATITUDE	LONGITUDE	CRT	ELEV	F. KHZ	TYPE/NAME	SOURCE
025	47° 16' 0095	122° 26' 0803	139	2.7	149835	Id (1974) Not on H-9410	**
026	47° 16' 1562	122° 28' 0519	139	4.0		Cummings (1974) Not on H-9410	**
027	47° 19' 0337	122° 25' 0862	139	2.9		Dash RM 3, 1973 not on H-9410	*
029	47° 15' 0526	122° 25' 0333	139	16.0		Tacoma, highest of three concrete stks 1935	1-245 not on H-9410
030	47° 15' 1142	122° 25' 0066	139	15.0		Tacoma Harbor, Puyallup Waterway Bridge Control House, 1935	1-245 not on H-9410
097	47° 18' 1784	122° 32' 0989	139	0.0		Bor, 1924	1-71 USED not on H-9410 directly for Hydro.
098	47° 19' 0036	122° 32' 1029	139	8.0		Pt. Defiance Lt., 1935	1-236
099	47° 19' 0200	122° 32' 0856	139	2.0			**
100	47° 17' 0720	122° 29' 0503	243	3.0			TP-00730
101	47° 17' 0801	122° 29' 0593	139	3.0			**
102	47° 17' 1264	122° 29' 1005	139	3.0	149835	Son, 1974	**
103	47° 17' 1477	122° 29' 1093	139	3.0			**
104	47° 17' 1739	122° 30' 0039	243	3.0			TP-00730
105	47° 18' 0075	122° 30' 0166	243	3.0			TP-00730
106	47° 18' 0189	122° 30' 0280	243	3.0			TP-00730
107	47° 18' 0253	122° 30' 0341	243	3.0			TP-00730
108	47° 18' 0505	122° 30' 0502	243	8.0			**
109	47° 18' 0652	122° 30' 0573	139	8.0			**

STA	LATITUDE	LONGITUDE	CRT	ELEV	F. KHZ	TYPE/NAME	SOURCE
110	47° 18' 0721	122° 30' 0653	139	6.0			**
111	47° 18' 0811	122° 30' 0859	139	5.0		Yacht Club Flagpole (1974)	**
112	47° 18' 0728	122° 30' 0987	243	3.0			TP-00730
113	47° 18' 0884	122° 30' 1245	139	3.0			TP-00730
114	47° 18' 1088	122° 31' 0384	139	3.0			**
115	47° 18' 1426	122° 31' 0745	139	3.0			**
116	47° 18' 1807	122° 31' 1085	139	3.0			**
117	47° 19' 0140	122° 32' 0142	139	3.0			**
118	47° 19' 0236	122° 32' 0493	139	3.0			**
119	47° 17' 0527	122° 29' 0308	243	3.0			TP-00730
120	47° 17' 0366	122° 29' 0120	243	3.0			TP-00730
121	47° 17' 0242	122° 29' 0039	243	3.0			TP-00730
122	47° 16' 1803	122° 28' 0905	243	3.0			TP-00731
123	47° 16' 1680	122° 28' 0759	243	3.0			TP-00731
124	47° 16' 1577	122° 28' 0557	243	3.0			TP-00731
125	47° 16' 1489	122° 28' 0615	243	3.0			TP-00731
126	47° 16' 1387	122° 28' 0320	243	3.0			TP-00731
127	47° 16' 1286	122° 28' 0095	243	3.0			TP-00731

STA	LATITUDE	LONGITUDE	CRT	ELEV	SOURCE
128	47° 16' 1240	122° 27' 1260	243	3.0	TP-00731
129	47° 16' 1164	122° 27' 1078	243	3.0	TP-00731
130	47° 16' 1042	122° 27' 0837	139	3.0	**
131	47° 16' 0855	122° 27' 0502	243	3.0	TP-00731
132	47° 16' 0778	122° 27' 0306	139	3.0	**
133	47° 16' 0699	122° 27' 0219	139	3.0	**
134	47° 16' 0569	122° 27' 0032	139	3.0	**
135	47° 16' 0483	122° 26' 1192	139	3.0	**
136	47° 16' 0321	122° 26' 1035	139	3.0	**
137	47° 15' 1812	122° 26' 0627	139	3.0	**
138	47° 15' 1372	122° 26' 0386	243	3.0	TP-00734
139	47° 15' 1080	122° 26' 0249	243	4.1	TP-00734
140	47° 16' 1775	122° 25' 1163	139	5.1	**
141	47° 16' 0323	122° 25' 0939	139	4.2	**
142	47° 15' 1552	122° 26' 0000	243	3.0	TP-00734
143	47° 15' 1528	122° 25' 1172	243	3.0	TP-00734
144	47° 15' 1445	122° 25' 1121	243	3.0	TP-00734
145	47° 15' 1415	122° 25' 1108	243	3.0	TP-00734
146	47° 15' 1284	122° 25' 1032	243	3.0	TP-00734

STA	LATITUDE	LONGITUDE	CRT	ELEV	SOURCE
147	47° 15' 1158	122° 25' 0974	243	3.0	TP-00734
148	47° 15' 1297	122° 25' 0956	243	3.0	TP-00734
149	47° 15' 1381	122° 25' 0995	243	3.0	TP-00734
150	47° 15' 1570	122° 25' 1017	243	3.0	TP-00734
151	47° 15' 1630	122° 25' 1030	243	3.0	TP-00734
152	47° 15' 1391	122° 25' 0848	243	3.0	TP-00734
153	47° 15' 1624	122° 25' 0917	243	3.0	TP-00734
154	47° 15' 1805	122° 25' 1004	243	3.0	TP-00734
155	47° 16' 0335	122° 25' 0449	243	3.0	TP-00732
156	47° 16' 0087	122° 25' 0298	243	3.0	TP-00732
157	47° 15' 1746	122° 25' 0155	243	3.0	TP-00734
158	47° 15' 1506	122° 24' 1196	243	3.0	TP-00735
159	47° 15' 1817	122° 25' 0090	243	3.0	TP-00734
160	47° 16' 0195	122° 25' 0232	243	3.0	TP-00732
161	47° 16' 0586	122° 25' 0359	243	3.0	TP-00732
162	47° 16' 0353	122° 25' 0090	243	3.0	TP-00732
163	47° 16' 0379	122° 24' 1188	243	3.0	TP-00733
197	47° 18' 1495	122° 25' 1058	139	3.0	**
198	47° 19' 0676	122° 24' 0063	243	3.0	TP-00729

STA	LATITUDE	LONGITUDE	CRT	ELEV	SOURCE
199	47° 19' 0676	122° 24' 0063	139	3.0	**
200	47° 19' 0399	122° 25' 0049	243	3.0	TP-00729
201	47° 19' 0275	122° 25' 0431	243	3.0	TP-00729
202	47° 19' 0415	122° 25' 0684	243	3.0	TP-00729
203	47° 19' 0331	122° 25' 0872	243	3.0	TP-00729
204	47° 19' 0093	122° 25' 0872	243	3.0	TP-00729
205	47° 18' 1686	122° 25' 1023	139	3.0	**
206	47° 18' 1329	122° 25' 1074	139	3.0	**
207	47° 18' 1039	122° 25' 1152	243	3.0	TP-00729
208	47° 18' 0831	122° 26' 0061	243	3.0	TP-00729
209	47° 18' 0738	122° 26' 0347	243	3.0	TP-00729
210	47° 18' 0114	122° 26' 0726	243	3.0	TP-00729
211	47° 17' 1732	122° 26' 0237	243	3.0	TP-00732
212	47° 17' 1589	122° 25' 1254	243	3.0	TP-00732
213	47° 17' 1552	122° 25' 0919	243	3.0	TP-00732
214	47° 17' 1632	122° 25' 0762	243	3.0	TP-00732
215	47° 17' 1611	122° 25' 0612	243	3.0	TP-00732
216	47° 17' 1587	122° 25' 0501	243	3.0	TP-00732
217	47° 17' 1544	122° 25' 0373	243	3.0	TP-00732

STA	LATITUDE	LONGITUDE	CRT	ELEV	TYPE/NAME	SOURCE
218	47° 17' 1582	122° 25' 0291	243	3.0		TP-00732
219	47° 17' 1442	122° 24' 1205	243	3.0		TP-00733
401	47° 16' 1009	122° 24' 0849	139	40.0	Port Docks, Black Tank, 1927	1-89
405	47° 16' 0688	122° 25' 0182	243	3.0		TP-00732
408	47° 16' 1062	122° 24' 1248	243	3.0		TP-00733
409	47° 16' 1627	122° 24' 0969	243	3.0		TP-00733
410	47° 17' 0189	122° 24' 1001	243	3.0		TP-00733
411	47° 17' 0126	122° 24' 0805	243	3.0		TP-00733
412	47° 17' 0192	122° 24' 0745	243	3.0		TP-00733
413	47° 16' 1431	122° 24' 0189	139	20.0	Tacoma Red Stack, 1933	1-1005
414	47° 16' 1145	122° 24' 0936	243	3.0		TP-00733
417	47° 16' 0779	122° 24' 0530	243	3.0		TP-00733
418	47° 16' 0587	122° 24' 0110	243	3.0		TP-00733
419	47° 16' 0729	122° 24' 0130	243	3.0		TP-00733
420	47° 16' 0780	122° 24' 0187	243	3.0		TP-00733
421	47° 16' 1073	122° 24' 0511	243	3.0		TP-00733
422	47° 17' 0117	122° 24' 0489	243	3.0		TP-00733
423	47° 17' 0187	122° 24' 0506	243	3.0		TP-00733
424	47° 17' 0031	122° 24' 0672	243	3.0		TP-00733

STA	LATITUDE	LONGITUDE	CRT	ELEV	SOURCE
425	47° 17' 0179	122° 24' 0758	243	3.0	TP-00733
426	47° 17' 0115	122° 24' 0818	243	3.0	TP-00733
427	47° 16' 0675	122° 24' 0723	243	3.0	TP-00733
500	47° 16' 1390	122° 29' 0315	243	3.0	***
501	47° 15' 1390	122° 27' 0946	243	3.0	***
504	47° 18' 0926	122° 25' 0630	243	3.0	***
505	47° 15' 0455	122° 25' 0118	243	3.0	TP-00734
506	47° 18' 0384	122° 26' 0465	243	3.0	TP-00729
507	47° 16' 0682	122° 26' 0075	243	3.0	TP-00734

LEGEND:

* From phone conversation with PMC
** From Horizontal Control work by the Davidson; refer to the horizontal control report for this project.
*** These geographic positions are coordinates of grid intersections on the boatsheet; any fixes using these signals are for computation only.

NOAA FORM 76-40 (2-71)
PRESCRIBED BY PHOTOGRAMMETRY INSTRUCTION NO. 54.

U.S. DEPARTMENT OF COMMERCE–NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- ☐ FIELD INSPECTION
- ☐ FIELD EDIT
- ☒ COMPILATION
- ☐ FINAL REVIEW
- ☐ QUALITY CONTROL AND REVIE

(See reverse for responsible personn

☒ TO BE CHARTED
☐ TO BE DELETED

ORIGINATING LOCATION: COMMENCEMENT BAY, TACOMA, WASHINGTON

DATE: MAR-APR 1974

The following objects have (~~XXXXXX~~) been inspected from seaward to determine their value as landmarks:

JOB NUMBER: ~~XXX~~ OPR-412-DA-74
STATE: WASHINGTON
SURVEY NUMBER: XX- H-9410 TP-
DATUM: NORTH AMERICAN 1927

CHARTING NAME	DESCRIPTION	POSITION LATITUDE ° ′	LATITUDE ″ O.M.METERS	POSITION LONGITUDE ° ′	LONGITUDE ″ O.P.METERS	METHOD AND DATE OF LOCATION (See instructions on reverse of this form) FIELD INSPECTION	COMPILATION	FIELD EDIT	CHARTS AFFECTED
Light	Fl 6 sec 21 ft 098	47 19	0036	122 32	1029				C&GS 6407, 6460
Flag Pole	Yacht Club 111	47 18	0811	122 30	0859				C&GS 6407
Marker	Lighted								C&GS 6407
Marker	Lighted								C&GS 6407
Markers	Lighted								C&GS 6407
Stack	009	47 17	1526	122 30	0456				C&GS 6407, 6460
Markers									C&GS 6407

NOAA FORM 76-40
(2-71)
PRESCRIBED BY
PHOTOGRAMMETRY INSTRUCTION NO. 64.

U.S. DEPARTMENT OF COMMERCE—NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

[redacted] LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- ☐ FIELD INSPECTION
- ☐ FIELD EDIT
- ☒ COMPILATION
- ☐ FINAL REVIEW
- ☐ QUALITY CONTROL AND REVIE

(See reverse for responsible personne

☒ TO BE CHARTED
☐ TO BE DELETED

ORIGINATING LOCATION: COASTAL MAPPING DIVISION, NORFOLK, VA

DATE: FEB. 1974

The following objects have (have not) been inspected from seaward to determine their value as landmarks:

JOB NUMBER: ~~PAX~~ CM-7311

STATE: Washington

SURVEY NUMBER: T - TP- 00730

DATUM: N.A. 1927

POSITION

CHARTING NAME	DESCRIPTION	LATITUDE ° ′	LATITUDE ″ D.M.METERS	LONGITUDE ° ′	LONGITUDE ″ D.P.METERS	METHOD AND DATE OF LOCATION (See instructions on reverse of this form) FIELD INSPECTION	COMPILATION	FIELD EDIT	CHARTS AFFECTED
STACK	(Ruston. American Smelting & Refining Co., Stack, 1924)	47 17	49.428 1526.4	12230	21.720 456.3		22 June 73E(C) 9100		6460 6407 185 SC
TV TR.	(Tacoma, TV Station KMO, Mast, 1954)	47 16	44.132 1362.9	12230	41.943 881.5	off sheet			" " "
TANK	(Reservoir Tank, 1927)	47 16	34.347 1060.7	122 30	37.538 789.0	off sheet			" " "
MARKER	Measured mile marker, front	47 17	34.5" 34" 1068.0	122 29	41" 42" 860.0				" " "
MARKER	Measured mile marker, rear	47 17	33.5" 34" 1032.0	122 29	42.5" 42" 894.0				" " "
TF00731 MARKER	Measured mile Southeast Range Front marker	47 16	52.4 1625	122° 28'	38.8 799.6	off sheet			
MARKER	Measured mile Southeast Range Rear marker	47 16	50.8 1575	122° 28'	40.0 841.0	off sheet			

NOAA FORM 76-40
(2-71)
PRESCRIBED BY
PHOTOGRAMMETRY INSTRUCTION NO. 64.

U.S. DEPARTMENT OF COMMERCE–NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NONFLOATING AIDS [redacted] FOR CHARTS

ORIGINATING ACTIVITY
- ☐ FIELD INSPECTION
- ☐ FIELD EDIT
- ☒ COMPILATION
- ☐ FINAL REVIEW
- ☐ QUALITY CONTROL AND REVIE

(See reverse for responsible personn

☒ TO BE CHARTED
☐ TO BE DELETED

ORIGINATING LOCATION: COASTAL MAPPING DIVISION, NORFOLK, VA

DATE: FEB 1974

The following objects have (have not) been inspected from seaward to determine their value as landmarks :

JOB NUMBER: ~~XXX~~ CM-7311
STATE: Washington

SURVEY NUMBER: T - H-9410
TP- 00730

DATUM: N.A. 1927

POSITION

CHARTING NAME	DESCRIPTION	LATITUDE ° ′	LATITUDE ″ D.M. METERS	LONGITUDE ° ′	LONGITUDE ″ D.P. METERS	METHOD AND DATE OF LOCATION (See instructions on reverse of this form) FIELD INSPECTION	COMPILATION	FIELD EDIT	CHARTS AFFECTED
MARKER	Lighted, private aid 1	47 18	08"	122 30	16"		·		6460 6407 185 SC
"	" " " 2	47 18	06"	122 30	13.5"				" " "
"	" " " 3	47 18	02.5"	122 30	08"				" " "
"	" " " 4	47 18	00"	122 30	07.5"				" " "
"	" " " 5	47 ~~18~~ 17	56"	122 30	02"				" " "

E-9410, 1974 VELOCITY CORRECTION TAPLE 3

31309874

000310 0 0001 0003 000 000000 000000
000720 0 0002
001190 0 0004
001650 0 0006
002100 0 0008
002460 0 0010
002870 0 0012
003200 0 0014
003570 0 0016
003910 0 0018
004250 0 0020
004560 0 0022
004880 0 0024
005200 0 0026
005600 0 0028
005920 0 0030

VELOCITY TAPLE 7
31308474

000100 0 1006 0007 000 000000 000000
000163 0 1005
000217 0 1004
000268 0 1003
000318 0 1002
000368 0 1001
000419 0 0000
000471 0 0001
000720 0 0002
001190 0 0004
001650 0 0006
002100 0 0008
002460 0 0010
002870 0 0012
003200 0 0014
003570 0 0016
003910 0 0018
004250 0 0020
004560 0 0022
004880 0 0024
005200 0 0026
005600 0 0028
005920 0 0030

4-9410, 1974 VELOCITY TAPLE 8

31308474

000120 0 1001 0003 000 000000 000000
000173 0 0000
000368 0 0001
000720 0 0002
001190 0 0004
001650 0 0006
002100 0 0008
002480 0 0010
002870 0 0012
003200 0 0014
003570 0 0016
003910 0 0018
004250 0 0020
004560 0 0022
004880 0 0024
005200 0 0026
005600 0 0028
005920 0 0030

FIELD TIDE NOTE

Field tide reduction of soundings was based on predicted tides from Seattle, Washington, corrected to Commencement Bay, Tacoma, Washington. The interpolations were done by the PDP8/e computer aboard the NOAA Ship FAIRWEATHER MSS-20, using program AM 5ØØ. Times of both predicted and recorded tides are based on time zone 000° GMT.

One Fischer & Porter ADR gage was installed on the Municipal Dock of the Port of Tacoma on 19 March, 1974. Location and period of operation is as follows:

Commencement Bay	47° 15.3' N.	37 days
	122° 26.0' W.	19 March - 25 April

The initial ADR gage was replaced on 29 March due to a faulty timer/drive mechanism (#6903A5568M9). The replacement gage (#7304A1380M16F) was installed immediately. (See Below) The ship's officers made frequent checks of the gage and insured the accuracy of the ADR gage. The operation of the gage was excellent.

LEVELS

Several days were required to level as the vertical displacement was great (about 118 feet), and winds made rod steadying difficult. One new bench mark was established and four others recovered. A total of five marks were leveled to upon installation; and four were leveled to upon removal, including the primary mark and new bench mark. The gage was removed on 25 April, 1974, with levels run to three marks, including the primary bench mark.

MISSING TIDES

FROM DAY	GMT	TO DAY	GMT
086	2000Z	091	1630Z

No hydrography was run those days except 088 day. Hydrography was resumed on 091 day.

4/22/75

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): Tacoma, Washington

Period: March 29 - April 25, 1974 *

HYDROGRAPHIC SHEET: H-9410

OPR: 412

Locality: Tacoma Harbor

Plane of reference (mean lower low water): 0.0 ft. March 29
0.1 ft. April

Height of Mean High Water above Plane of Reference is 8.0 ft.

Remarks: Zone direct.

* Period extended from March 25 to April 26 per telecon Green/Hubbard, 23 May 1975.

James R Hubbard
for Chief, Tides Branch

GEOGRAPHIC NAMES

Survey No. 9410, 1974

Name on Survey	On Chart No 6407, 6462 A	On previous survey No. B	On U.S. Coast Pilot maps C	From local information D	On local maps E	P.O. Guide or Map F	Rand McNally G	U.S. Light List H	K	
Commencement Bay	x									1
Dalco Passage	x									2
Point Defiance	x									3
Point Defiance Park	x									4
Ruston	x									5
Tacoma Yacht Club	x									6
										7
										8
										9
										10
										11
										12
										13
										14
										15
						APPROVED				16
						Chas. E. Hannington				17
						STAFF GEOGRAPHER - C51x2				18
						30 Dec. 1976				19
										20
										21
										22
										23
										24
										25
										26

APPROVAL SHEET

FOR

SURVEY H-9410

A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position print-out has been made. A new final sounding print-out has been made.

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the verifier's report.

Date: 9/11/76

Signed: [signature]

Title: Chief, Verification Branch

NOAA FORM 77-27
(9-72)
(PRESC. BY HYDROGRAPHIC MANUAL 20-2, 6-94, 7-13)

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

HYDROGRAPHIC SURVEY STATISTICS

HYDROGRAPHIC SURVEY NO. H-9410

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET & 2 overlays	1	BOAT SHEETS	(2 parts) 1
DESCRIPTIVE REPORT	1	OVERLAYS (preliminary)	11

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
Folders			45			
CAHIERS	1					
VOLUMES	6					
BOXES			1(contains folders listed above)			

T-SHEET PRINTS (List) TP-00728, TP-00730

SPECIAL REPORTS (List)

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				1950
POSITIONS CHECKED		~~1950~~		
POSITIONS REVISED		100		
DEPTH SOUNDINGS REVISED		200		
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		1	signal 98	
	TIME (MANHOURS)			
Verification of Control		51		
Verification of Positions		56		
VERIFICATION OF SOUNDINGS		180		
Smooth Sheet		46		
ALL OTHER WORK		20		
TOTALS		353	HIT 11	

	BEGINNING DATE	ENDING DATE
PRE-VERIFICATION BY A. E. Eichelberger A. E. Eichelberger	9/19/74	10/2/74
VERIFICATION BY James L. Stringham James L. Stringham	12/10/74	8/4/76
REVIEW BY	BEGINNING DATE	ENDING DATE

P.C. Inspection 10-1-76

38 hrs D. Ericksen
20 hrs G. Ayers

Baumgardner Chg 11/21/77

U.S.G.P.O. 12/26/76 1972-769-562/439 REG. #6

REGISTRY NO. H-9410

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey, the following shall be completed:

CARDS CORRECTED

DATE_____ TIME REQUIRED_____ INITIALS_____

REMARKS:

REGISTRY NO. H-9410

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE_____ TIME REQUIRED_____ INITIALS_____

REMARKS:

H-9410

Information for Future Presurvey Reviews

Because of slag dumping operations, ongoing shoreline changes are expected in the vicinity of latitude 47°18.4', longitude 122°30.45' and latitude 47°17.67', longitude 122°29.8'.

The 19-foot sounding in latitude 47°18.2', longitude 122°30.3' is believed to mark a 54-inch sewer outfall pipe constructed in 1949. Future survey operations should include an investigation of this immediate area to ascertain the extent and least depth of this feature.

Position Index		Bottom Change Index	Use Index	Resurvey Cycle
Lat.	Long.			
471	1224	2	4	25 years
471	1223	3	4	50 years

VERIFIER'S REPORT

H-941Ø, 1974 Commencement Bay, Tacoma Harbor DA-5-1-74

This survey was verified and plotted at the Pacific Marine Center, Seattle, Washington. Information relating to this survey is provided as specified in Chapter 6 of the Provisional Hydrographic Manual.

I. INTRODUCTION

The Mini-Ranger electronic positioning system operating in a range/range mode and three-point visual sextant fixes were utilized for positioning control. Mini-Ranger transponders were placed over existing triangulation stations. The control net and information was checked and confirmed to be accurate.

Projection parameters used to prepare the boatsheet have been revised to accommodate an inset. The boatsheet submitted was too large in size to plot on the PMC Xynetics plotter. The effective inset and main sheet junction is along longitude 122° 32' ØØ" West.

Two pseudo stations were used during the verification of H-941Ø, 1974 survey. The two stations are: Station number 1Ø located at latitude 47° 19' 3Ø" N longitude 122° 31' 45" W, plotted on the inset; Station number 11 located at latitude 47° 19' ØØ" N, longitude 122° 31' ØØ" W plotted on the main sheet. The above two stations were used to strengthen the plotting control for many positions. The boatsheet position plot was used when either the above pseudo signals were utilized for stronger positioning control.

Boatsheet soundings were reduced from Seattle, Washington predicted tides. H-941Ø, 1974 smooth sheet was reduced with approved tides inferred from the standard tide gage Seattle, Washington for the following Julian days 84, 85, 88 and 91. The tide gage installed on the municipal dock in City Waterway Tacoma, Washington was used to reduce soundings from Julian day 92 thru day 115. As there were no problems in junctions or crosslines, tide correctors are accepted as correct.

H-941Ø, 1974 smooth position overlay was plotted with pen color by launch because of duplicated position numbers: black ink for launch 3131 and red ink for launch 3132.

II. CONTROL AND SHORELINE

See Ship's Report items F and G. The shoreline was transferred from unreviewed Class I maps TP-ØØ728 and TP-ØØ73Ø scale 1:5,ØØØ.

TP-ØØ728

Date of Photography	June 1973
Date of Field Edit	March and April 1974, January 1975
Date of ~~Final Compilation~~	~~March 1975~~

TP-ØØ73Ø

Date of Photography	June 1973
Date of Field Edit	March and April 1974
Date of ~~Final Compilation~~	January ~~June~~ 1975 April 1975

Launch 3131 (DA-1) attempted positions on docks and the ferry slip to confirm manuscript plot. The following six positions were rejected because of weak position control and no check angles: 9ØØ1, 9ØØ2, 9ØØ3, 9ØØ4, 9ØØ5 and 9ØØ6, day 115. The manuscript plot was held with no adjustments from hydrographic information.

The following conflicts between the boatsheets and photo manuscripts were resolved after a phone conversation with Mr. A. C. Rauck, Jr. of Coastal Maps Compilation. Control information for these items was not verified from hydrographic raw data printouts or volumes. The following latitude and longitude reference information is scaled from the smooth boatsheet.

TP-ØØ73Ø Class I Manuscript:

A. Dolphins located at approximate latitude 47° 17' 16.1" N, longitude 122° 29' 14.Ø" W and buildings located at approximate latitude 47° 18' 25.7" N, longitude 122° 3Ø' 54.5" W are not shown on the smooth sheet as stated in field edit information.

B. Two detached positions 8Ø37 and 8Ø38 are carried on day 115 launch 3131. No hydrographic descriptive information is contained in the raw data for position 8Ø37 or position 8Ø38. Position 8Ø37 at approximate latitude 47° 17' 42" N, longitude 122° 29' 43" W was inked in black as a piling, taken from the smooth boatsheet. Position 8Ø38 at approximate latitude 47° 17' 31" N, longitude 122° 29' 32" W was inked in black as a steel piling, as shown on the smooth boatsheet.

C. The piling located at approximately 47° 17' 23.2" N and 122° 29' 22.5" W on the boatsheet is in disagreement with the piling plot on the Class I manuscript. The manuscript plot was held over the boatsheet plot.

D. A group of piles are located at approximate latitude 47° 17' 39" N, longitude 122° 29' 4Ø" W. on the field sheet. Two piles are displayed on the photo manuscript and were carried ~~forth~~ forward to the smooth sheet.

Point Defiance Light signal number 98 was plotted on the smooth boatsheet with the 1935 positional information. H-9410, 1974 and Class I manuscript TP-00728 display Point Defience Light at the 1973 location. (See intersection station computation back of verifier's report.)

NOAA form 76-40 was submitted with incomplete information as to the location and description of some features. TP-00730 Class I map displays four private aid markers. The NOAA form 76-40 contains information for five private markers, the fifth marker is believed to be on the same position as signal 107.

Commencement Bay measured nautical mile northwest range lights front and rear were transferred to the smooth sheet from the Class I manuscript TP-00730 photo location.

No unusual controlled hydrography was attempted on H-9410, 1974. Some inshore positions contain pseudo signal information listed in the raw records as FCO (for computer only). The control listing used for reverification is appended in smooth printout.

The signals falling outside the highwater line were described on the smooth sheet with the use of the boatsheet, manuscript and verifier's prior experience participating in the project in Tacoma Harbor.

II. HYDROGRAPHY

Problems existed along the west side of Commencement Bay on H-9410, 1974 from the shoreline out to depths of 300 feet. The very steep slope that exists along the shoreline causes irregular depth curves and possible sounding interpretation adjustments of 20 feet to some soundings, accounting for disagreements between boatsheet and smooth sheet soundings and depth curves.

The development located at latitude 47° 17' 15" N to latitude 47° 17' 30" N and longitude 122° 28' 45" W to longitude 129° 29' 20" W ~~in the area of~~ near the junction with H-9412, 1974 was difficult to adjust and smooth~~en~~ curves. This was caused by the use of visual control hydrography utilizing Raytheon D. E. 723 fathometer operating in the same area as Mini-Ranger control with Ross fathometer. On adjoining lines of hydrography the Mini-Ranger control and Ross fathometer were deeper than visual controlled and D. E. 723 fathometer soundings. Because of the steep slope the comparison was poor. The above operation did not aid in accomplishing a good junction between H-9410, 1974 and H-9412, 1974. Junction is good between H-9410 + H-9412

A larger scale development of the Tacoma Yacht Club basin would have improved the effective information in updating the present chart.

Form C&GS 733m, Bottom Sediment Data Log Sheet, contained wood chips for positions 1006 and 1069. H-9410, 1974 smooth sheet does not display wood

chips as a bottom characteristic at the latitude and longitude of the two listed bottom samples.

Local notice to marines number 51 dated 27 September 1973 states that Puget Sound Traffic Lane Separation Lighted Buoy "TC" LLNR 2302.35 has been redesignated Puget Sound Traffic Lane Separation Lighted Buoy "TC" LLNR 2301.11 and relocated at latitude 47° 19' 30" N and longitude 122° 27' 19" W. (See attached copy of LNM 51.) this buoy was not located on the present survey.

IV. CONDITION OF THE SURVEY

The hydrographic records, overlays, smooth sheet and report are adequate and conform with the requirements of the Hydrographic manual and PMC OPORDER 1974 edition. H-9412, 1974 was conducted prior to change number 1-75 February 3,1973 page 3-15a, paragraph H-restricting the use of electronic control on large scale surveys.

V. JUNCTIONS

The junction with contemporary survey H-9411, 1974 scale 1:5,000 to the east was accomplished with excellent agreemnet. The junction note and c curves were inked.

The junction with contempory survey H-9412, 1974 scale 1:5,000 to the south was accomplished with a few adjustments but considering the bottom characteristics and density of the soundings in the junction area agreement is very good. The junction note and curves were inked.

VI. COMPARISON WITH PRIOR SURVEYS

H-9410, 1974 was compared to the following prior surveys H-5931, 1935, H-5932, 1935 and H-6200, 1936.

H-5931, 1935 scale 1:10,000 soundings in fathoms:

Considering the scale and the year of the prior survey H-5931, 1935 agreement with H-9410, 1974 was very good. Generally H-9410, 1974 is shoaler 1 to 6 feet over most depths compared. No soundings or topographic information was transferred from H-5931, 1935 to supplement H-9410, 1974 survey.

H-5932, 1935 scale 1:10,000 soundings in fathoms:

H-5932, 1935 agreement with H-9410, 1974 was very good considering the scale and the year of H-5932, 1935. Generally H-9410, 1974 was shoaler 1 to 3 feet in depths 20 to 300 feet and 5 to 25 feet in depths 300 to 575 feet. No soundings or topographic information was transferred from H-5932, 1935 to supplement H-9410, 1974 survey.

During the comparison ~~one~~ significant changes ~~was~~ were noted, that the high water line has moved approximately 100 meters to the east at approximate

latitude 47° 18' 2Ø" north and longitude 122° 3Ø' 3Ø" west. Slag is being dumped in this area from American Smelting and Refining Company. (See ship's report item K.) Also extensive filling has altered the MHWL in the vicinity of lat. 47°17.8, long. 122°29.85'.

H-62ØØ, 1936 scale 1:5,ØØØ sounding in feet:

H-62ØØ, 1936 agreement with H-941Ø, 1974 was very good. H-941Ø,1974 is generally slightly deeper. No soundings or topographic information was transferred from H-62ØØ, 1936 to supplement H-941Ø, 1974 survey.

H-941Ø, 1974 survey is complete and adequate to supersede the above compared prior surveys in common areas.

VII. COMPARISON WITH CHART

H-941Ø, 1974 was compared to chart 64Ø7, 12th edition January 27, 1973 revealing good agreement.

No pre-survey review items were listed on this survey.

IX. ADDITIONAL FIELD WORK

This survey is adequate to supersede charted information. No additional field work is recommended.

Respectfully submitted,

James L. Stringham
Cartographic Technician
August 4, 1976

Examined and Approved,

James S. Green
Chief, Verification Branch

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY, Pacific Marine Center
1801 Fairview Ave. E., Seattle, WA 98102

Date: 9 September 1976

To: Eugene A. Taylor, RAIM
Director, Pacific Marine Center

From: Donald E. Nortrup, LCDR
Chief, Processing Division

Subject: PMC Hydrographic Survey Inspection Team Report, H-9410

This survey is a basic hydrographic survey of Tacoma Harbor, Washington conducted by NOAA Ship DAVIDSON in 1974 in compliance with Project Instructions OPR-412-DA-74, dated 14 March 1974. The smooth sheet was found to be very well prepared during the inspection.

This survey was undertaken, in part, to determine the feasibility of utilizing Mini-Ranger III to control 1:5000 harbor surveys. The survey was undertaken prior to the implementation of the M/R baseline calibration procedure, therefore, electronic control correctors were determined from daily calibrations. The M/R test indicated accuracy very slightly less than what was subsequently determined to be acceptable for 1:5000 scale surveys. M/R control was used exclusively in the deep water, generally greater than 200 feet, portions of the survey. The near shore portion of the survey north of 47° 18.4' N was controlled by visual methods. The near shore area south of this line was surveyed using both M/R, with Ross fathometer, and visual, with Raytheon fathometer. This intermixing of hydrography using differing methods of control and, especially, differing beam width fathometers over steep bottom gradients served to complicate the verification process. It is the inspection team's opinion that Mr. Stringham did a very good job in dealing with this situation.

The first of the aluminum hydrographic survey launches was utilized during this project. This fact, along with the M/R test requirement and a severely limited time frame for the operation combined to aggravate the accomplishment of quality hydrography. Despite the handicap, the inspection team feels that DAVIDSON produced a good survey and deserves our recognition of the fact. Similarly, the verifier, Mr. Stringham, did a very good job during the processing of this survey. The end product is a good basic hydrographic survey.

The inspection team finds H-9410 to be complete and adequate for charting purposes and to supersede all prior surveys. Administrative approval is recommended.

Donald E. Nortrup, LCDR

Dean R. Seidel, LCDR

John C. Albright, LCDR

Richard D. Lynn

Administrative Approval
H-9410

The smooth sheet and reports of this survey have been reviewed and the survey is complete and adequate for charting and to supersede all prior surveys.

E. A. Taylor

Eugene A. Taylor, RADM
Director, Pacific Marine Center

9/14/76

Date

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C352

October 1, 1976

TO: A. J. Patrick
Chief, Marine Surveys Division

THRU: Chief, Quality Control Branch

FROM: D. J. Romesburg
Quality Evaluator

SUBJECT: Quality Control Report for H-9410 (1974), Puget Sound, Northwest Portion of Commencement Bay, Washington

A quality control inspection for H-9410 has been accomplished to evaluate the accuracy and adequacy of the survey with respect to data acquisition, delineation of the bottom, determination of least depths and navigational hazards, junctions, shoreline transfer, and decisions and actions taken by the verifier and cartographic presentation of data.

Present hydrography will be compared and a junction, if necessary, completed with H-9411 (1974) on the east during the quality evaluation of that survey.

The present survey is considered complete and adequate and to conform to the standards of the National Ocean Survey, except for the deficiencies listed below.

1. The inset of Point Defiance should have been surrounded by a heavy black margin as specified in section 7.2.4 of the Provisional Hydrographic Manual.

2. The stylus belt length on the Ross Fathometers appeared to be in error on several days. The analog record should be kept as accurate as possible to ensure meaningful depth checks between the digitizer and analog readings.

3. Specific mention of the following charted features should have been made by the reviewer in the Verifier's Report under the heading, Comparison with Chart.

a. The five lighted markers located at piers in the immediate vicinity of latitude 47°18.1', longitude 122°30.2' on the present survey originate

with TP-00730. The positions of these markers differ from charted markers that originate with CL 326/68.

b. A number of piers are charted in the area of latitude 47°18.25', longitude 122°30.7' from T-6444 (1935) and 1963 air photos (Bp 98164). Since many new piers and boathouses appear in the vicinity from TP-00730, it is assumed that the charted structures no longer exist. The piers and boathouses as shown on the smooth sheet are recommended to be charted.

c. The shoreline charted in the immediate vicinities of latitude 47°18.4', longitude 122°30.45' and latitude 47°17.65', longitude 122°29.75' from 1963 and 1972 air photos (Bp's 98164, 84811) differs considerably from its delineation as shown on the smooth sheet.

d. The foul area charted in the immediate vicinity of latitude 47°18.3', longitude 122°30.7' originating with CL 326/68 was neither proved nor disproved on the present survey and should be retained on the chart.

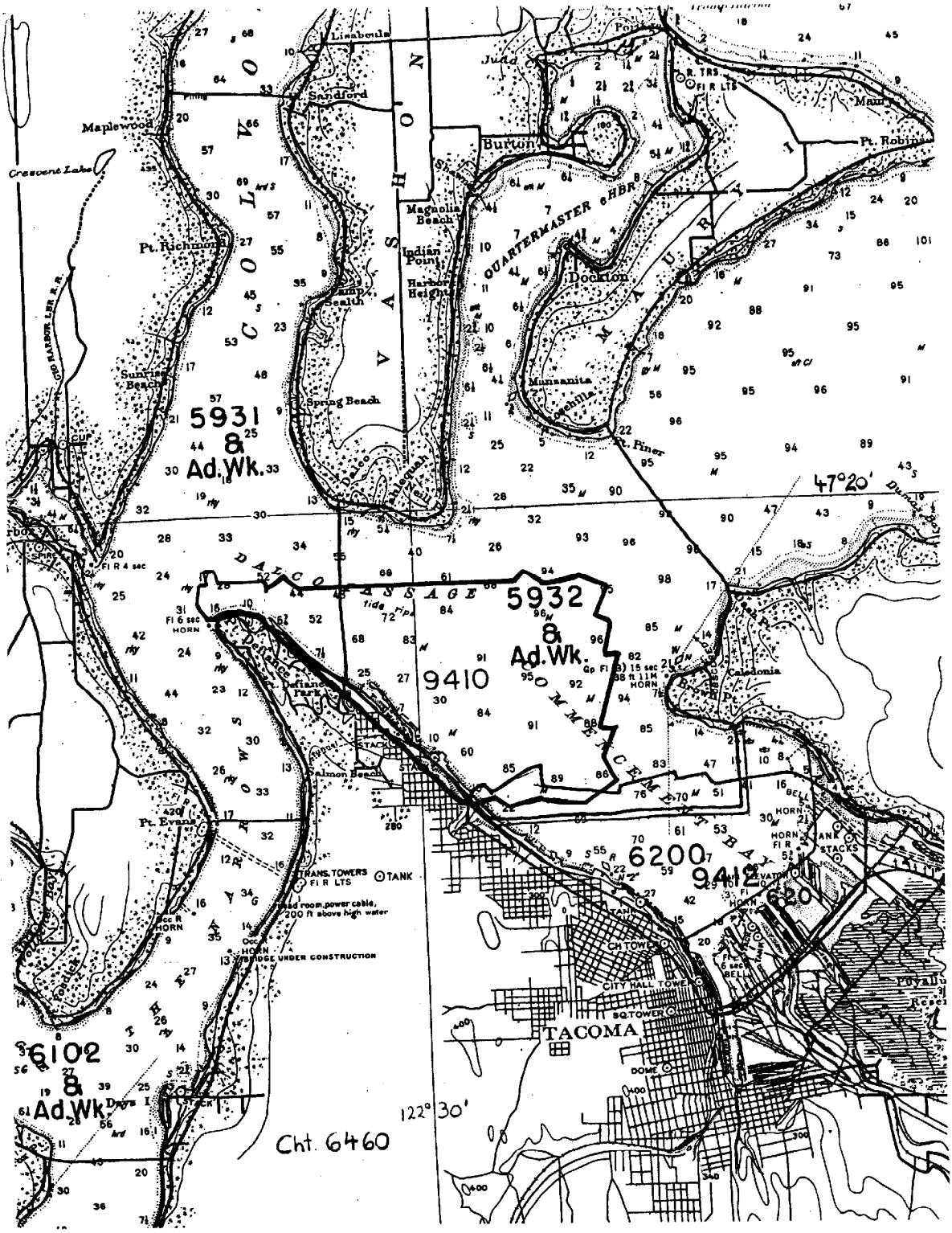
e. The controlling depth note - 10 feet 1968 - charted in latitude 47°18.25', longitude 122°30.55' from CL 326/68 is discredited by a 6-foot sounding located at latitude 47°18.28', longitude 122°30.6' on the present survey. It is recommended that the soundings on the smooth sheet be noted.

4. The statement that the survey is adequate to supersede charted information under the heading, Additional Field Work, is incorrect. A comment pertaining to the adequacy of the survey in regard to the charted features noted for retention in item 3 of the critique should have been mentioned under the heading, Comparison with Chart.

5. It is common practice to compare present surveys with charted hydrography in adjoining areas of overlap when junctional contemporary surveys are nonexistent and prior surveys are not specified to junction the present survey by the Project Instructions. A statement to the effect that no contemporary surveys junction the present survey on the north should have been made in the Review Report under the heading, Junctions. Also, the reviewer should have indicated that the present survey depths in this area are in general harmony with the charted depths.

6. It should be noted that the major differences as indicated in the review between prior and present soundings in some areas of deeper depths are probably due to methods of surveying. The closer development of the present survey delineates the bottom configuration in much greater detail than previously shown.

cc:
C351


Sandford
Maplewood
Crescent Lake
Pt. Richmond
Sunrise Beach
Spring Beach
Salmon Beach
Pt. Evans
Burton
Magnolia Beach
Indian Point
Harbor Heights
Dockton
Quartermaster Hbr
Maury I.
Pt. Robinson
Pt. Piner
Munsanita
Quemla
Colvos Passage
Dalco Passage
Commencement Bay
Pt. Defiance Park
Caledonia
Tacoma
City Hall Tower
Sq. Tower
Dome
Ch. Tower
Stacks
Trans. towers
Fl R Lts
Tank
Bridge under construction
5931
8
Ad. Wk.
5932
8
Ad. Wk.
9410
6200
9412
620
6102
8
Ad. Wk.
47°20'
122°30'
Cht. 6460

FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9410

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
6407	2-18-77	Hamilton	Full ~~Part~~ ~~Before~~ After Verification Review Inspection Signed Via
			Drawing No. 22
6460	2-22-77	Hamilton (RCS)	Full ~~Part~~ ~~Before~~ After Verification Review Inspection Signed Via
			Drawing No.
185	3-25-77	Hamilton	Full ~~Part~~ ~~Before~~ After Verification Review Inspection Signed Via
			Drawing No.
6471	5-25-77	R. C. Lawson RCS	Full [redacted] After Verification Review Inspection Signed Via
			Drawing No. through chart 6407
18474	1-16-84	D. C. Haspire	Full ~~Part~~ ~~Before~~ After Verification Review Inspection Signed Via
			Drawing No. 1 Applied thru Chart 18453
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8556-P63