8136

Diag. Cht.No. 6002-2.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. WCFP-1254 *Office No.* H-8136

LOCALITY

State Washington

General locality Willapa Bay

Locality Entrance to Willapa Bay

19~~4~~54

CHIEF OF PARTY

C. A. George

LIBRARY & ARCHIVES

DATE July 6, 1956

B-1870-1 (1)

8136

Form 537
(Ed. June 1940)

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.

REGISTER No. H-8136

Field No. WCFP-1254

State WASHINGTON

General locality WILLAPA BAY

Locality ENTRANCE TO WILLAPA BAY

Scale 1:10,000 Date of survey 1 Sept. to 29 Oct. 1954

Instructions dated 9 March 1954

Vessel West Coast Field Party

Chief of party C. A. George

Surveyed by G. E. Haraden, K. A. MacDonald and R. M. Sylar

Soundings taken by ~~echometer~~ graphic recorder, ~~hand lead wire~~

Fathograms scaled by Field Party

Fathograms checked by Field Party

Protracted by C. R. Lehman

Soundings penciled by C. R. Lehman

Soundings in ~~fathoms~~ feet at ~~MLW~~ MLLW and are true depths

REMARKS:

U. S. GOVERNMENT PRINTING OFFICE 693019

NOTES FOR DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY

REGISTERY NO. H-8136 (1954) FIELD NO. WCFP-1254

ENTRANCE TO WILLAPA BAY, WASHINGTON

PROJECT CS-372 SCALE 1:10,000

WEST COAST FIELD PARTY C. A. GEORGE, CHIEF OF PARTY

SURVEYED BY: G. E. HARADEN, K. A. MACDONALD, AND R. M. SYLAR

A. PROJECT

The work was done in accordance with instructions 22/MEK, FP-West Coast, dated 9 March 1954, addressed to CDR. C. A. George, OinC., West Coast Field Party

B. SURVEY LIMITS AND DATES

The area covered by this survey includes that part of Willapa Bay North of Latitude 46° 40', and West of Longitude 123° 58', including Pine Island Channel from its junction with the main channel to Daybeacon No. 10. The area covered by recent Corps of Engineers survey was not surveyed.

Field work began 1 September 1954 and ended 29 October 1954.

A junction was made with contemporary survey H-8137 (1954) to the south.

C. VESSEL AND EQUIPMENT

USC&GS Launch No. 122, based at Bay Center, Washington was used for all fathometer sounding, the turning radius at sounding speed was approximately 12 meters. Skiff no. USC&GS 475 was used for pole soundings in the vicinity of North Cove.

Fathometer No. 152 SPX, of the 808 J type was used throughout.

D. TIDE AND CURRENT STATIONS

A standard tide gage was maintained at Toke Point, Washington. All tide reducers were computed from data obtained from this station. No time or range corrections were applied to the tidal data in reducing soundings.

E. SMOOTH SHEET

The smooth sheet will be plotted by the Seattle Processing Office. The smooth sheet projection should be skewed sufficiently to include the small amount of hydrography in Latitude 46° 40.8', Longitude 123° 57.3'. This work was done on a "dog-ear" on the boat sheet.

F. CONTROL STATIONS

The source of control was as follows:

1. Previous triangulation:

   (a) WILLAPA BAY (2nd Order) 1952 and 1953-G-10474 Pages 1 to 3.
   (b) OLYMPIC PENINSULA (1st Order) 1953-G-10362 Pages 1,4, & 9.
   (c) STRAIT OF SAN JUAN DE FUCA, 1939 Pages 654 and 655.
   (d) COLUMBIA RIVER TO WILLAPA BAY 1939-G-5788 Pages 749 to 776.

2. Description of Recoverable Topographic Stations from Surveys T-9634, T-9635, T-9637, and T-9638.

3. Triangulation locations of temporary hydrographic stations in 1954. See 1954 G. P. List.

4. Form 567, Non-floating Aids dated 24 February 1954 from Baltimore Photogrammetric Office.

5. Photo-hydro signals located by field party on manuscripts T-9634 S, T-9634 N, T-9635 S, T-9635 N, T-9637 N and T-9638.

G. SHORELINE AND TOPOGRAPHY

Shoreline for the boat sheet was transferred from blue line prints of manuscripts no. T-9634 N, T-9635 N, T-9635 S, and T-9634 S.

Shoreline in the vicinity of Empire Spit differed greatly from the manuscript; sextant fixes were taken along the high water line and the shoreline revised on the boat sheet. The entire area in the vicinity of Empire and Graveyard Spit is subject to constant change.

The low water line was delineated except in areas of breakers.

H. SOUNDINGS

Soundings were taken with an 808 J fathometer, calibrated at 800 fms/sec., and with a sounding pole in the vicinity of North Cove. Velocity corrections were applied to fathometer soundings to obtain true depths.

I. CONTROL OF HYDROGRAPHY

Hydrography was controlled by sextant fixes throughout.

J. ADEQUACY OF SURVEY

The survey is considered complete and adequate to supersede prior surveys for charting. A shallow area approximately 1/8 mile wide and one mile long, extending in a southwesterly direction from Latitude 46° 41.0' and Longitude 124° 02.0' was not surveyed. It has from two to three feet of water at low water but is surrounded by breakers except for a small entrance at the east end. It is changeable due to frequent storms, and prevailing weather conditions made it unsafe to attempt hydrography in the area.

A satisfactory junction was made with survey H-8137 (1954) to the south and with U. S. Engineers surveys on the north. bp 5/7/83

Depth curves of 3 and 9 feet were used to define submarine features on the boat sheet. (omitted from smooth sheet except for 3-ft. curve around Ellen Sands.)

K. CROSSLINES

A total of approximately 9% crosslines were run with good agreement.

L. COMPARISON WITH PRIOR SURVEYS

A comparison with U. S. Engineers surveys No. E-4-2-288, 29 January 1954, scale 1:12,000 and No. E-4-7-23, July 1954, scale 1:24,000 shows generally good agreement. Rapid shoaling is indicated in the area just west of Entrance Buoy No. 14.

Comparison with earlier surveys is impracticable due to the radical changes in the area.

M. COMPARISON WITH CHART

A comparison with Chart 6185, printed 3 March 1954, shows the following:

A shoal with a least depth of five feet was found at Latitude 46° 40.73', Longitude 124° 00.85'. The chart shows 22 feet at this location. 5 ft. now charted

At Latitude 46° 40.4' and Longitude 124° 00.6', the chart shows a depth of 10 feet, whereas a depth of 18 feet was obtained on the present survey. chart has been revised

Pine Island Channel Daybeacon No. 2 was found missing. It was replaced by the Port of Willapa Harbor on 14 October 1954 and was located by the hydrographic party. The entrance to Pine Island Channel has changed considerably.

N. DANGERS AND SHOALS

The only important danger was the shoal at Latitude 46° 40.73', Longitude 124° 00.85'. This shoal was reported to the Washington Office by letter dated 21 September 1954. (CL 860-1954)

O. COAST PILOT INFORMATION

Coast Pilot Information was furnished The Director by letter of 13 December 1954.

P. AIDS TO NAVIGATION

The only fixed aid to navigation located by the survey party was Pine Island Channel Daybeacon No. 2. The position determined by the hydrographic party on 15 October 1954 (Sounding Vol. No. 11, Page 11) was: Latitude 46° 41' ~~808~~ 847 meters and Longitude 123° 58' ~~827~~ 876 meters. This position was scaled from the boat sheet and furnished The Director by letter CL 897 (1954) dated 28 October 1954. The location of this daybeacon should be submitted on Form 567 when the smooth sheet is plotted.

By letter, 22/MEK, dated 7 September 1954, The Director requested that a sketch of the hydrography in the vicinity of Pine Island Channel with the new positions of the daybeacons indicated be furnished as soon as the hydrography in the area was completed. A copy of my letter dated 24 September 1954, forwarding this information is included in this report.

A list of the floating aids located by the hydrographic party follows:

Buoy	Date Located	Pos.No.	Depth ft.	Lat.	Long.
WILLAPA BAY					
Entrance Buoy 14	7 Sept. 1954	24"b"	65	46° 42.78'	124° 03.38'
Entrance Lighted Bell Buoy 16	7 Sept. 1954	31"b"	52	46° 42.01'	124° 02.12'
Entrance Buoy 17	4 Oct. 1954	98"1"	69	46° 41.88'	124° 01.02'
Channel Lighted Bell Buoy 18	6 Oct. 1954	107"m"	72	46° 41.43'	124° 00.41'
Channel Buoy 20	4 Oct. 1954	166"1"	22	46° 41.59'	123° 59.35'
Channel Lighted Buoy 22	4 Oct. 1954	173"1"	33	46° 41.82'	123° 58.30'
WILLAPA RIVER					
Channel Buoy 1	4 Oct. 1954	177"1"	26	46° 41.82'	123° 57.80'

Q. LANDMARKS FOR CHARTS

Landmarks recommended by topo project.

There are no recommended landmarks within the limit of this survey.

U. VELOCITY CORRECTIONS

Velocity corrections were determined from bar checks taken during the hydrographic operations. Copies of the abstract of velocity and phase corrections to be applied to the soundings on this survey is included in this report.

Z. TABULATION OF APPLICABLE DATA

Applicable Data	Forwarded To	Date
TIDAL DATA		
Level Records, Toke Point and Bay Center	The Director	3 August 1954
Level Records, Palix River	The Director	28 Sept. 1954
Tide Marigrams, Bay Center and Palix River	The Director	28 Sept. 1954
Tide Rolls, Toke Point	The Director	8 Oct. 1954
Hourly Heights, Tide Curves and Reducers	Seattle Processing Office	Jan. 1955
PHOTOGRAMMETRIC DATA		
Field Photographs	Baltimore Photo Office	8 Oct. 1954 27 Oct. 1954
Office Photographs	Portland Photo Office	3 Nov. 1954
Manuscripts T-9634 S, T-9634 N, T-9635 S, T-9635 N, T-9637 N, and T-9638	Seattle Processing Office	3 Nov. 1954
HYDROGRAPHIC DATA		
Boat Sheets, Fathograms, Velocity Correction Report, Control Data	Seattle Processing Office	Jan. 1955

Submitted,

Kenneth A. MacDonald

Kenneth A. MacDonald
Ensign, USC&GS

Approved and Forwarded,

C. A. George

C. A. George
CDR., USC&GS
OinC, West Coast Field Party

STATISTICS FOR HYDROGRAPHIC SURVEY

Field No. WCFP 1254 (1954)

SHEET NO. H-8136

West Coast Field Party CS-372

Vol. No.	Day Letter	Date	HL Sdgs.	No. Pos.	Stat. Miles	Sdg.
1	a	1 Sept.		105	14.1	Launch
1 & 2	b	7 Sept.		79	14.9	"
2	c	9 Sept.		113	14.1	"
3	d	10 Sept.		101	16.6	"
3	e	14 Sept.		32	5.5	"
4	f	16 Sept.		45	4.9	"
4	g	17 Sept.		112	14.1	"
5	h	20 Sept.		191	24.8	"
6	j	28 Sept.		96	14.1	"
6 & 7	k	30 Sept.		149	21.0	"
7 & 8	l	4 Oct.		177	23.5	"
8 & 9	m	6 Oct.		173	27.5	"
10	n	12 Oct.		94	13.2	"
11	p	15 Oct.		18	3.4	"
12	a(green)	29 Oct.	178	49	3.0	Skiff
TOTAL			178	1,534	214.7	

Total area 6.7 square statute miles

TIDE NOTE TO ACCOMPANY DESCRIPTIVE REPORT

OF SURVEY H-8136 (1954) WCFP-1254

The standard tide gage located at Toke Point at Latitude 46° 42.47' and Longitude 123° 57.93' was used for obtaining all tide reducers for all of Survey H-8136.

Mean lower low water on the tide staff corresponds to a reading of 3.7 feet. No corrections to the observed readings were applied for differences in time or height.

Reference: The Director's letter, 36-rjb, dated 11 August 1954.

ABSTRACT OF VELOCITY CORRECTIONS
FOR HYDROGRAPHIC SURVEY
PROJECT CS-372
Willapa Bay, Washington

Corrections		Dates	To Be Applied Sheet	Day Letter
A Scale		**(PERIOD 1)**		
0.0 to 44.0	0.0	14 July thru 10 Aug.	WCFP 1354	"a" thru "s"
44.5 to 52.0	+0.2	and	H-8137	"ga" thru "db"
52.5 to 55.0	+0.4	2 Sept. thru 19 Oct.		
B Scale(& C Scale)				
35.0 to 47.0	+0.2		WCFP 15154 H-8138	"a" thru "e"
47.5 to 52.5	+0.4			"j" thru "n"
53.0 to 56.0	+0.6			
56.5 to 58.5	+0.8			
59.0 to 61.5	+1.0			
62.0 to 64.0	+1.2		WCFP 1254 H-8136	"b" thru "p"
64.5 to 67.5	+1.4			
68.0 to 71.5	+1.6			
72.0 to 75.5	+1.8	13 October	WCFP 1454	"a" day only
76.0 to 110.0	+2.0			
A Scale		**(PERIOD 2)**		
0.0 to 55.0	0.0	11 Aug. thru 18 Aug.	WCFP 1354 H-8137	"t" thru "x"
B Scale(& C Scale)				
35.0 to 38.0	+1.4		WCFP 15154 H-8138	"f" thru "g"
38.5 to 42.0	+1.6			
42.5 to 47.5	+1.8			
48.0 to 56.5	+2.0			
57.0 to 71.5	+2.2			
72.0 to 110.0	+2.4			
A Scale		**(PERIOD 3)**		
0.0 to 30.0	0.0	19 Aug. thru 2 Sept.	WCFP-1354 H-8137	"y" thru "fa"
30.5 to 38.0	+0.2			
38.5 to 42.5	+0.4		WCFP-15154 H-8138	"h" day only
43.0 to 46.5	+0.6			
47.0 to 50.0	+0.8			
50.5 to 53.0	+1.0		WCFP-1254 H-8136	"a" day only
53.5 to 56.0	+1.2			
B Scale(& C Scale)				
35.0 to 42.0	+1.2			
42.5 to 54.5	+1.4			
55.0 to 63.0	+1.6			
63.5 to 70.0	+1.8			
70.5 to 79.0	+2.0			
79.5 to 89.0	+2.2			
89.5 to 105.0	+2.4			

ABSTRACT OF PHASE CORRECTIONS

Field No. WCFP 1254 (1954)

Sheet No. H-8136

West Coast Field Party CS-372

From Pos. No.	To Pos. No. (inclusive)	Phase Corr.
104 a + 4 Sdgs.	104 a + 8 Sdgs.	-1.0
7 b + 3	8 b + 5	+1.0
8 b + 6	13 b	-2.0
13 b + 1	18 b + 2	+1.0
63 b + 8	65 b	+1.0
112 c + 4	113 c	+1.0
58 d + 3	59 d + 1	+1.0
65 d + 4	74 d + 4	+1.5
80 d	80 d + 2	- 2.0
98 d + 1	98 d + 5	- 1.0
98 d + 6	101 d	- 1.5
39 h	41 h + 1	- 1.0
160 h	163 h + 4	+ 1.0
11 j + 4	14 j + 3	- 1.0
16 j	17 j + 3	- 2.0
17 j + 4	19 j	- 1.0
37 j + 4	40 j + 3	- 1.0
72 j + 7	74 j	- 2.0
49 k	52 k	+ 0.8
57 k	62 k + 3	+ 1.0
84. k + 5	85 k + 3	- 1.0
111 k + 11	116 k + 1	+ 1.0
126 K + 7	127 k	+ 1.0
129 k	131 k	+ 1.0
142 k	143 k + 3	+ 1.0
21 l	-	- 1.0
47 l + 5	49 l + 3	- 1.0
72 l + 5	73 l	+ 0.5
74 l	74 l + 2	- 2.0
89 l + 3	90 l	+ 1.0
87 M + 2	89 n	+ 1.0

LIST OF STATIONS ON H-8136 (1954)

Field No. WCFP-1254

Name Used In Hydro Survey	Origin Of Station
BETA	T-9634 *
BUM	Vol. 2, Page 62
CAN	Manuscript T-9635 N
DRY	G. P. List WCFP, 1954
EAR	Willapa River Range Rear Light 4, 1953
ELL	G. P. List, WCFP, 1954
FLAG	Willapa Bay C. G. Station Flagstaff 1939
GOO	G. P. List, WCFP, 1954
HOW	Manuscript T-9635 N
JIM	JIM (USE), 1939
LEAD	LEAD 4, 1939
LIG	Bay Center Directional Light, 1953
LOG	G. P. List, WCFP, 1954
PIN	Pine Island Channel Daybeacon No. 10, 1953
RED	Manuscript T-9634 N
RIV	Cedar River Flats Light , 1953
ROCF	T-9635 *
ROY	Willapa Bay Light, 1953
STU	Vol. 2, Page 62
TAR	Manuscript T-9634 N
TRX	Manuscript T-9634 N
TOK	Manuscript T-9635 N
TOM	Manuscript T-9635 S

* Position From "Description of Recoverable Topographic Station"(Form 524)

West Coast Field Party

P.O. Box 758

South Bend, Washington

24 September 1954

To: The Director
U. S. Coast & Geodetic Survey
Washington 25, D. C.

Subject: Hydrography - Vicinity of Pine Island Channel and Center Cutoff Channel, Willapa Bay

Reference: Acting Director's letter, 22/MEK, dated 7 September 1954

There is enclosed a sketch of the hydrography in the vicinity of Pine Island Channel and Center Cutoff Channel.

The positions of the Pine Island Channel Daybeacons indicated on the sketch are the 1953 triangulation positions. The existing locations were verified by sextant fixes taken at the beacons by the hydrographic party. The fix at Daybeacon No. 6 plotted ten (10) meters northeast of the triangulation position, however, it is believed this may be due to distortion in the boat sheet rather than a movement of the beacon.

Beacons are from Topographic Location per records of T-9635

Daybeacon No. 2 is missing. Daybeacon No. 4 is in very poor condition and may be lost in the near future.

The manager of the Port of Willapa Harbor is very much interested in these surveys, and authority to furnish him with a copy of the enclosed sketch is requested.

C. A. George
CDR., USC&GS
CdnC, West Coast
Field Party

cc: Supervisor, Northwestern District

APPROVAL SHEET

SURVEY H-8136 (FIELD NO. WCFP-1254)

The survey is considered complete and adequate. No additional field work is recommended.

The boat sheet was examined daily as the field work progressed.

The field records and boat sheet are to be forwarded to the Seattle Processing Office for smooth plotting in accordance with the Director's letter, 22/MEK, dated 11 October 1954.

All corrections to the soundings have been entered and checked. The soundings have been reduced, but not checked.

C. A. George

C. A. George
CDR., USC&GS
CinC, West Coast
Field Party

Form 567
April 1945

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS ~~OR LANDMARKS~~ FOR CHARTS

TO BE CHARTED ~~XXXXXXXXXX~~ } STRIKE OUT ONE

Seattle, Washington 22 June, 19 56

I recommend that the following objects which have ~~xxxxxxx~~ been inspected from seaward to determine their value as landmarks be charted on ~~xxxxxxxxx~~ the charts indicated.

The positions given have been checked after listing by William M. Martin

C. A. George

Chief of Party.

STATE / CHARTING NAME	DESCRIPTION	SIGNAL NAME	POSITION LATITUDE ° ′	LATITUDE D.M. METERS	LONGITUDE ° ′	LONGITUDE D.P. METERS	DATUM	METHOD OF LOCATION AND SURVEY No.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
	Pine Island Channel Day Bn. No. 2		46 41	797	123 58	845	N.A. 1927	Sextant H-8136	10/15/54		x		6185

This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and *nonfloating aids* to navigation, if redetermined, shall be reported on this form. The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

16—51606-1 U. S. GOVERNMENT PRINTING OFFICE

PROCESSING OFFICE NOTES
H-8136 WCFP-1254

E. SMOOTH SHEET

The smooth sheet was hand constructed in the Seattle Processing Office using standard methods.

G. SHORELINE AND TOPOGRAPHY

Blue line prints of manuscripts as listed in field report plus the shoreline changes as revised on boat sheet in vicinity of Graveyard Spit and Empire Spit. Some changes in channels through North Cove and in changeable area between the spits.

J. ADEQUACY OF SURVEY

Junctions with surveys H-8137 and H-8138 are satisfactory and depth curves can be adequately drawn.

The three-foot curve was used to help delineate shoal areas.

K. CROSSLINES

Crosslines are in good agreement.

N. DANGERS AND SHOALS

1. Lat. 46° 40.73', Long. 124° 00.88' - 5 ft. MLLW
2. Lat. 46° 41' 21", Long. 124° 01' 10" - 6 ft. MLLW - 34n 35n
3. Lat. 46° 41' 29", Long. 124° 01' 18" - 6 ft. MLLW - 47h 48h

Respectfully submitted,

Clarence R. Lehman
Cartographic Compilation Aid

Examined and Approved:

William M. Martin
William M. Martin
Cartographer-in-charge, SPO

Approved and Forwarded:

Frank G. Johnson
Frank G. Johnson, Captain, C&GS
Seattle District Officer

GEOGRAPHIC NAMES ON H-8136

BAY CENTER CHANNEL

CANNERY SLOUGH

CEDAR RIVER

ELLEN SANDS

EMPIRE SPIT

GOOSE POINT

GRAVEYARD SPIT

KINDRED ISLAND

LEADBETTER POINT

NORTH BEACH PENINSULA

NORTH COVE

PINE ISLAND

RUSSELLSLOUGH (PINE ISLAND CHANNEL)

TOKE POINT

WILLAPA BAY

GEOGRAPHIC NAMES

Survey No. H-8136

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	
Washington									BGN	1
Willapa Bay										2
Leadbetter Point										3
North Beach Peninsula									BGN	4
Bay Center										5
Goose Point										6
Bay Center Channel										7
Ellen Sands										8
Pine Island										9
Pine Island Channel				(not Russell Slough)						10
Toke Point		(tide station)								11
Kindred Island										12
Cedar River										13
Empire spit										14
Graveyard Spit										15
North Cove										16
Cannery Slough										17
										18
					Names approved					19
					7-18-56					20
					L. Heck					21
										22
										23
										24
										25
										26
										27

M 234

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8136

Records accompanying survey:

Boat sheets 1; sounding vols. 12; wire drag vols. .....;

bomb vols. .....; graphic recorder rolls 7-Envelopes

special reports, etc. 1-Smooth sheet and 1-Descriptive report.....

1-Velocity Correction Report filed in Cahier with H-8335.....

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

Number of positions on sheet		1534
Number of positions checked		17
Number of positions revised		1 (93a)
Number of soundings revised (refers to depth only)		20 (20 straighten lines)
Number of soundings erroneously spaced		0
Number of signals erroneously plotted or transferred		0
Topographic details	Time	2 hr.
Junctions	Time	4 hr.
Verification of soundings from graphic record	Time	15 hr.

Verification by Stephen J. Rose Total time 118 hr. Date Aug. 1, '57

Reviewed by W. Evans Time 33 Date 10/7/57

M-2232-1

VERIFIER'S REPORT OF HYDROGRAPHIC SURVEY NO. H- 8136

The verifier should deal with the present hydrographic survey only, as the reviewer considers its relation to previous surveys and published charts. He should be thoroughly familiar with Chapters 3, 7 and 9 of the Hydrographic Manual.

1. The descriptive report was consulted and appropriate notes were made in soft pencil regarding action taken.

2. Soundings originating with the survey and mentioned in the descriptive report have been verified, including latitude and longitude.

3. All reference to survey sheets mentioned in the descriptive report include the registry number and year.

4. Geographic names of hydrographic features if on sheet are in slanting lettering and of topographic features in vertical lettering. Pine Island Channel daybeacons were inked upper-case vertical red in the processing office. These daybeacons are not signals as indicated by the red circles which were also inked in the processing office. These errors were not corrected during verification. Corrected JFE

5. All items affecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken.

6. All positions verified instrumentally were check marked in the sounding records.

7. All critical soundings are clear and legible and are a little larger than the adjacent soundings.

8. The metal protractor has been checked within the last three months.

9. The protracting and plotting of all bad crossings were verified.

10. All detached positions locating critical soundings, rocks or buoys were verified.

11. The boat sheet was compared with the smooth sheet. Channels West of Empire Spit accepted from the B.S. and not from T-9634 N manuscript. ✓

(14.) A handlead depth taken while underway (at 1,000 R.P.M.) on "h" day (vol. 5, p. 18) was ~~disregarded~~. BOTTOM SAMPLE WAS INKED.

confirmed to a degree by the fathogram - sdg. plotted
JHE

12. The spacing of soundings as recorded in the records was closely followed.

13. The bottom characteristics were shown on outstanding shoals.

14. The reduction and plotting of doubtful soundings were checked. A few depths befor. pos. 65 and 75 "d" day were inked at one-foot variance from the record, and were not indicated in the volumes. Authority: Sand-ridges, wave-action, notes p. 37 and 39, Vol. 3. Also, note initial "d" day, vicinity pos. 66 and 75.

15. The transfer of contemporary topographic information was carefully examined.

16. All junctions were transferred and overlapping curves made identical.

17. The notation "JOINS H- (19--)" was added in ink for all contemporary adjoining or overlapping sheets now registered. Those not verified are shown in pencil.

18. The depth curves have been inspected before inking.

19. All triangulation stations and transfer of topographic and hydrographic signals were checked.

20. Heights of rocks were checked against range of tide. No rocks

21. Rocks transferred from topographic surveys have a dotted curve where shown thereon. Rocks located accurately by hydrographer are encircled by dotted red curve.

22. Unnecessary pencil notes have been removed.

23. Objects on which signals are located and which fall outside of the low water line have been described on the sheet.

24. The low water line and delineation of shoal areas have been properly shown. Shoreline and channels subject to constant changes. Hydro. information given preference over T manuscripts which were compiled in 1954 from previous data. (Hydro in Sept. & Oct. 1954)

25. Degree and minutes values and symbols have been checked.

26. Questionable soundings have been checked on the fathograms.

H-8136

27. Source of shoreline and signals (when not given in report).
Photos for T-9634 and T-9635 taken in 1950 and 1951. ~~The T-sheets were approved in 1952~~ Field inspection was in 1953
Unreviewed as of 10/2/57

28. All notes on sheet are in accordance with figure 171 in the Hydrographic Manual.

29. All aids located, with those on contemporary topographic sheets, have been shown on survey.

30. Depth curves were satisfactory except as follows:

S

31. Sounding line crossings were satisfactory except as follows:

S

32. Junctions with contemporary surveys were satisfactory except as follows:

S

33. Condition of sounding records was satisfactory except as follows:

S

34. The protracting was satisfactory except as follows:

S

35. The field plotting of soundings was satisfactory except as follows:

S

36. Notes to reviewer: Suggest shoreline revisions West of Toke Point on chart # 6185

Under #4. — H-8136 shows Pine Island daybeacons as signals. H-8137 shows them as triangulation stations. corrected WE

Verified by J. Rose Date August 1, '57

RHC

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Rev. Apr. 1950

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Coastal Surveys:~~ 29 August 1956

Division of Charts: R. H. Carstens

Plane of reference approved in
12 volumes of sounding records for

HYDROGRAPHIC SHEET 8136

Locality Willapa Bay, Washington

Chief of Party: C. A. George in 1954
Plane of reference is mean lower low water, reading
3.7 ft. on tide staff at Toke Point
13.8 ft. below B. M. 4 (1922)

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

Condition of records satisfactory except as noted below:

William Shofus

Chief, ~~Division of~~ Tides ~~and Currents~~ Branch.

U. S. GOVERNMENT PRINTING OFFICE 877933

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-8136 FIELD NO. WCFP-1254

Washington - Entrance to Willapa Bay

PROJECT NO. CS 372

Surveyed - 1 Sept. to 29 Oct. 1954 Scale: 1:10,000

Soundings: Control:

808 Depth Recorder Sextant fixes

Sounding pole

Chief of Party - C. A. George
Surveyed by - G. E. Haraden, K. A. MacDonald, R. M. Sylar
Protracted by - C. R. Lehman (Seattle P. O.)
Soundings plotted by - C. R. Lehman
Verified and inked by - S. Rose
Reviewed by - L. V. Evans, III Date: 7 Oct. 1957
Inspected by-R. H. Carstens

1. Shoreline and Control

The shoreline originates with unreviewed photogrammetric surveys T-9634 and T-9635 of 1950-53 with revisions by the hydrographic party.

The sources of control are given in the Descriptive Report.

2. Sounding Line Crossings

Depth at crossings are in adequate agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately defined except where breakers prevented complete development.

The bottom consists of several channels cut through extensive sand flats and shoals. The main entrance channel is maintained by periodic dredging by the Corps of Engineers. The area is unstable and is subject to continuing shifting of the channels and shoals.

4. Junctions with Contemporary Surveys

A satisfactory junction was made with H-8138 (1954) to the west. The junction on the south with H-8137 (1954) will be considered in the review of that survey.

There are no contemporary surveys to the east; soundings at the eastern limit of the present survey are in harmony with charted depths.

Considering the rapidly changing nature of the bottom a satisfactory junction was made with the Corps of Engineers' condition survey of July 1954. (Bp. 51783).

5. Comparison with Prior Surveys

H-335 (1852) 1:20,000
H-1799(1887) 1:20,000
H-2045(1890) 1:20,000
H-2046(1890) 1:20,000
H-3297(1911) 1:20,000
H-4215 (1922) 1:20,000
H-4658 (1927) 1:15,000
H-6518 (1939) 1:10,000
H-6519 (1939) 1:10,000

These surveys comprise the previous coverage of the present survey area. A comparison between the present and prior surveys shows that this area is subject to continual, extensive changes. The extent of the changes is greatest in the vicinity of lat.46°43' long. 124°04', where the present entrance channel is nearly 2 miles north of its position in 1887.

Changes within the bay show varying shoaling, scouring and shifting of channels. An extreme example of shoaling is the present 5-ft. shoal in lat. 46°40.7', long. 124°00.9', falling in 72-ft. depths on the 1887 survey.

The points of land, islands and sand bars show extensive, alternate erosion and accretion.

Because of the pronounced changes and the unstable character of this area a more detailed comparison whould serve no purpose within the scope of this review. The present survey supersedes the prior surveys for charting purposes within the common areas.

6. Comparison with Chart 6185 (print date 6/4/56)

A. Hydrography

The charted hydrography originated principally with Corps of Engineers surveys, with partial application of the present survey through a copy of the boat sheet, (Bp. 51988), and with some unimportant information retained from prior surveys. Minor changes have been made to a few soundings during verification.

The present survey supersedes the charted hydrography except for that which originates with Corps of Engineers surveys made after the date of the present survey.

B. Aids to Navigation

All aids to navigation are in substantial agreement with their charted positions and adequately mark the intended features.

7. Condition of Survey

a. The field records are complete and comprehensive.

b. The smooth plotting was well done.

8. Compliance with Project Instructions

This survey adequately complies with the Project Instructions.

9. Additional Field Work Recommended

This is a good basic survey and no additional field work is recommended.

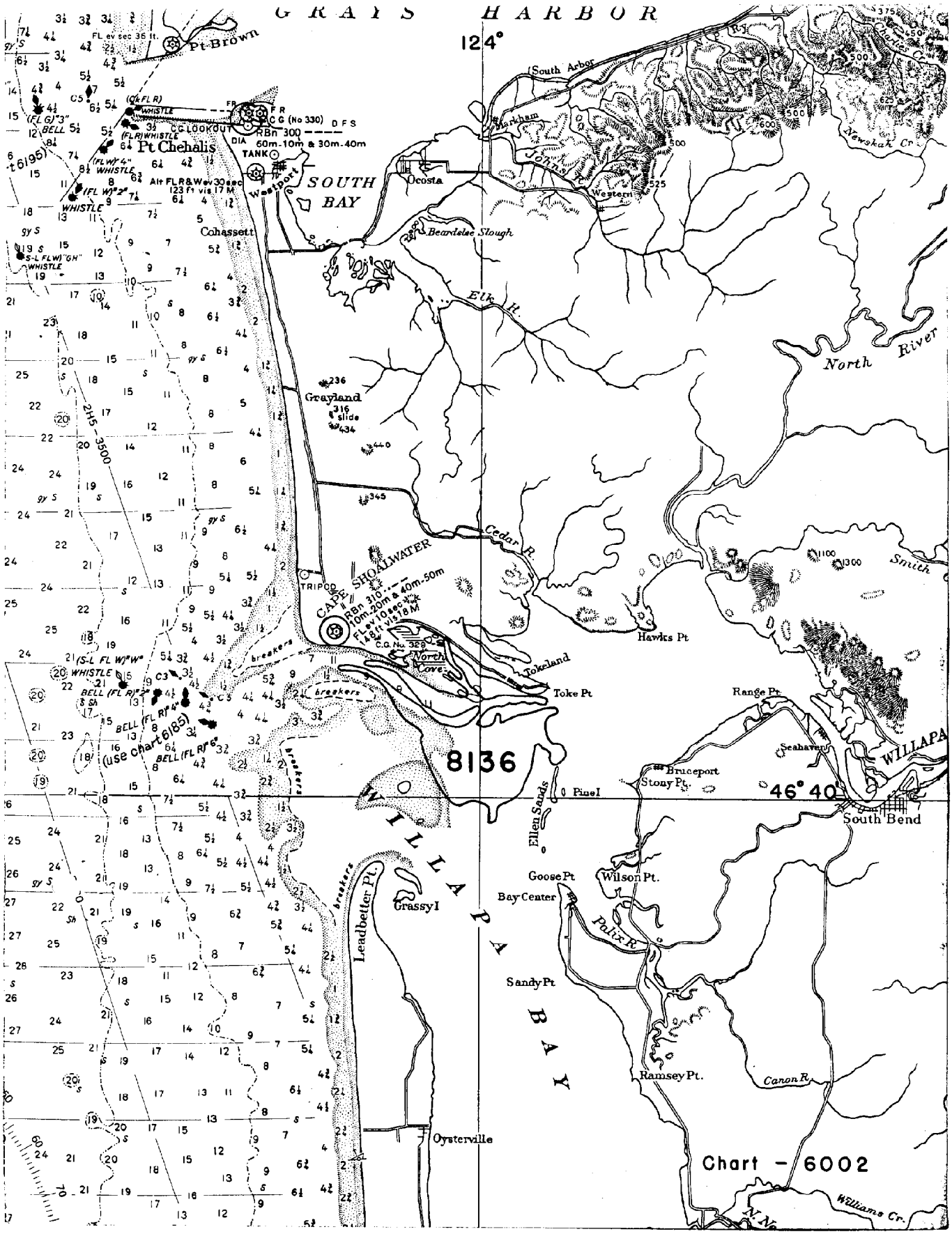
Examined and approved:

Max G. Ricketts
Chief, Nautical Chart Branch

Charles A. Schanck
Chief, Division of Charts

Karl B. Jeffers 11/26/57
Chief, Hydrography Branch

Samuel B. Grenell
Chief, Division of Coastal Surveys


GRAYS HARBOR
124°
Pt Brown
Pt Chehalis
FL ev sec 36 ft.
(Q FL R) WHISTLE
FR
C G (No 330) D F S
RBn 300
DIA 60m-10m & 30m-40m
C G LOOKOUT
TANK
West Port
SOUTH BAY
Alt FL R & Wev 30 sec 123 ft vis 17 M
Cohassett
Ocosta
South Arbor
Markham
Johns R.
Western
Newskah Cr
Beardslee Slough
Elk R.
North River
Grayland
316 slide
434
345
Cedar R.
CAPE SHOALWATER
TRIPOD
RBn 310°
10m-20m & 40m-50m
Fl ev 10 sec 148 ft vis 18 M
C.G. No. 329
North Cove
breakers
Tokeland
Toke Pt
Hawks Pt
Range Pt
Smith
Seahaven
WILLAPA
Bruceport
Stony Pt.
Pinel
Ellen Sands
South Bend
46° 40'
8136
WILLAPA BAY
Goose Pt
Wilson Pt.
Bay Center
Palix R.
Grassy I
Leadbetter Pt.
Sandy Pt
Ramsey Pt.
Canon R.
Oysterville
Chart - 6002
Williams Cr.
2H5-3500
(use chart 6185)
(S-L FL W) "WH" WHISTLE
BELL (FL R) "4"
(FL W) "2" WHISTLE
(FL G) "3" BELL
(FL R) WHISTLE
(FL W) "4" WHISTLE
(S-L FL W) "GH" WHISTLE

NAUTICAL CHARTS BRANCH

SURVEY NO. H-8136

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
9-6-57	6185	R.K. de Lauder	Exam ~~Before~~ After Verification and before Review. No correction.
9-23-58	6002	T.A. Dinamore	~~Before~~ After Verification and Review Examined - no correction
8/7/61	6185	J.H. Eaton	Comp app'd. ~~Before~~ After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.