8431
WIRE DRAG

Diag. Cht. No. 6380-2.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. PF-1158W.D. *Office No.* H-8431 W.D.

LOCALITY

State Washington

General locality Anacortes

Locality Guemes Channel

19 58

CHIEF OF PARTY

F. B. Quinn

LIBRARY & ARCHIVES

DATE Spetember 3, 1958

B-1870-1 (1)

8431
WIRE DRAG

Form 537
(Ed. Nov. 1941)

REG. NO.

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-8431 W.D.

Field No. PF-1158WD.

State Washington

General locality Anacortes

Locality Guemes Channel

Scale 1:10,000 Date of survey 17 March - 2 May, 1958

Instructions dated

Vessel PATHFINDER

Chief of party F. B. Quinn

Surveyed by M Paulson, V. Kilisk, G E Wirth, D. Stark, P Taetz, H.D. Nygren and S. Baker

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

Protracted by C. Ellis.

Soundings penciled by Wire Drag & C. Ellis
WD. Inked by - D.R Engle

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

REMARKS:

A & D Sheet - penciled by I.M. Zerking
Inked by D.R. Engle

KWW 2/7/94

U. S. GOVERNMENT PRINTING OFFICE 428975

H-8431

DESCRIPTIVE REPORT TO ACCOMPANY WIRE DRAG SURVEY SHEET (FIELD NO. PF 1158WD)

GUEMES CHANNEL, WASHINGTON

USC&GS SHIP PATHFINDER F. B. QUINN, CAPT., COMMANDING

A. PROJECT:

The project instructions are titled "Special Project 1-58, Wire Drag Survey, Guemes Channel, Washington" dated 23 January 1958, and addressed to the Commanding Officer, USC&GSS PATHFINDER.

B. SURVEY LIMITS AND DATES:

The wire drag survey is in Guemes Channel, Washington. It is bounded by latitudes 48° 30.5' and 48° 31.4', and longitudes 122° 33.4' and 122° 40.8'.

There is no prior wire drag survey for comparison or junction. The hydrographic survey of the area is sheet H 8331 (HO 1155 and HO 1255). (1957)

The season began on 17 March with reconnaissance and signal building by a detached unit. The wire drag operations began 8 April 1958 and were completed on 2 May. Progress on this survey was retarded due primarily to the swift currents during flood and ebb tides, coupled with the exacting requirements of the instructions. To obtain an effective depth within three feet of the bottom in the areas less than 50 feet created considerable difficulty at other than slack current.

This project was the first of the season, equipment breakdown was numerous and most of the personnel were completely inexperienced.

C. VESSEL AND EQUIPMENT:

The survey was made from ship based launches, including the drag tender. Launch 3 was the guide launch, launch 4 was the end launch, and launch 2 was the tender. Occasionally launch 1 was also used for testing the drag and assisting the tender launch party.

Soundings were obtained with portable depth recorders, type 808 J. The depth recorder number 52 on launch 3 was operated continuously during the operation, and marked on each fix. The soundings were recorded on the fix only since the launch maneuvered about between fixes to maintain the drag on line. The soundings were recorded to assist the plotter and have not been entered on the smooth wire drag sheet. The fathometer was not calibrated during the survey, but was tested subsequent to the survey and noted to be operating properly as to speed and bar check calibration. The hydrography along the new Texas Company pier was accomplished with launch 2 and fathometer number 57-22.

D. TIDE AND CURRENT STATIONS:

The tide station was located at latitude 48° 31.65' and longitude 122° 36.72'. The site was the same as that used for the hydrographic survey sheet H 8331. No time and range corrections were required.

No current stations were observed.

E. SMOOTH SHEET:

The smooth sheet projection was made by hand on the ship PATHFINDER in accordance with standard procedures. The shoreline and topographic signals were transferred from blackline manuscripts number T 11228, T 11229, and T 11231. of 1952-53, in the Washington Office.

The plotting of the sheet was accomplished in the field in conjunction with hydrographic survey operations on other projects. It should be noted that temperature and atmosphere conditions vary considerably from day to day.

F. CONTROL STATIONS:

The source of the control is the Geographic Position for localities of:

Bellingham to Padilla Bay to Rosario Strait, Washington
Guemes Channel and Fidalgo Bay, Washington
San Juan Channel, Washington
San Juan Islands, Washington

Topographic stations were obtained from blackline manuscripts number T 11228, T 11229, and T 11231. of 1952-53.

Three hydro-signals were located by sextant cuts, and the remainder of the hydro-signals used were copied from smooth sheet H 8331. (1953) The hydro-signals that were copied from smooth sheet H 8331 were used to a very limited degree in the vicinity of the Shell Oil Company pier.

G. SHORELINE AND TOPOGRAPHY:

The shoreline and topographic detail was obtained from tracings of blackline manuscripts number T 11228, T 11229, and T 11231. No discrepancies were noted to the general shoreline, however, checking this detail was not of a particular concern of this project.

Construction of a new pier was underway in Fidalgo Bay, sextant cuts were taken on the pier to locate it. A copy of the construction plans was obtained from the Texas Company and previously forwarded to the Director for Chart Corrections.

H. SOUNDINGS - EFFECTIVE DEPTHS:

The wire-drag survey was made in accordance with standard practices. All positions and effective depths have been copied into the Guide Launch records, and the soundings obtained on the guide launch have been entered in the record book on the positions. see P 5

H. SOUNDINGS - EFFECTIVE DEPTHS: (Continued)

Considerable extra work has been required to complete the records and bring them up to standard because of the inexperience of the personnel. Time limitations on the project did not allow a delay necessary to adequately train the observers and recorders. As a result, numerous angle errors were noted throughout, and in some instances, insufficient notes kept by the tender and drag testing parties. At the end of the project, the operation was moving quite smoothly. This comment is not a reflection on the quality of the drag results because all questionable data was resolved in the field prior to leaving the area, but is mentioned as a reason for the duplication of coverage in some areas.

Difficulty in controlling the drag depths between uprights was noted from B through F days. A small toggle was used on the wire allowing considerable sag, and resulting in either numerous hangups and/or shortening the uprights. Duplication of coverage of some of this area was also required to prove clearances. On G day, larger toggles were used and more consistent tests were obtained.

Considerable lift was noted when running against the heavy currents, and the work day was planned to take advantage of the slack periods as much as possible. The slack periods and resulting currents varied considerably from the east to the west end of Guemes Channel.

A hydrographic line was run along the new pier in Fidalgo Bay, and two lines were run past the ends of both piers to supplement the drag information and chart corrections.

I. CONTROL OF HYDROGRAPHY:

The wire drag was controlled by sextant fixes according to standard practices.

J. ADEQUACY OF SURVEY:

The survey is adequate and complete to supersede prior surveys for charting. There are no junctions to be made with prior surveys, and there are no holidays in the areas dragged.

Attachment No. 1 entitled "Itemization of Drag Hangs and Clearances" lists, in detail, the groundings by position number and latitude and longitude, with a description of the clearance.

L., M., N. COMPARISON WITH PRIOR SURVEYS, CHARTS, AND DANGERS AND SHOALS:

These items are listed in detail in attachment no. 1. No report has been made to the Coast Guard for publishing. The Seattle District Officer has given copies of the boat sheet clearances, previously forwarded, to various Oil Companies and other interested organizations. These organizations should be informed of the discrepancies in cleared depths shown on the smooth sheet as compared to the boat sheet.copy they were furnished.

attachment by field party filed with fathograms. obstruction sheets by W.O. attached to this Report

O. COAST PILOT INFORMATION:

Since this survey was for an express purpose, and the instructions exacting as to clearance requirements, this information has not been listed. Coast Pilot information should be compiled after review of the sheet. It would be recommended that the channel be navigated at slack tides for deep draft vessels.

P. AIDS TO NAVIGATION:

No new aids to navigation were located. If information on hand is correct that very deep draft vessels will be using the channel, it is recommended that ranges be established for navigation. At the west end in particular, the currents are very erratic as to logical flow and the deep channel very narrow.

Q. LANDMARKS FOR CHARTS:

The Texas Company Pier underconstruction in Fidalgo Bay was located and this information previously furnished to the Director for charting purposes. A micro-wave tower was located by hydro cuts, but not listed as a description of the tower was not obtained. It is not known whether or not this tower is a television reflector or a classified military installation.

R. GEOGRAPHIC NAMES:

No additional information obtained.

S. SILTED AREAS:

Itemized on Attachment 1.

T. BY-PRODUCT INFORMATION:

It is determined that this survey was for the express purpose of determining the feasability of using this channel for very deep draft vessels. Unless the channel is well marked, it is our recommendation that the channel not be used for very deep draft vessels.

H-8431

Descriptive Report (Wire Drag Survey Sheet 1) - Continued

Z. TABULATION OF APPLICABLE DATA PREVIOUSLY FORWARDED:

1. Area and Depth tracing of the boat sheet - May 1958
   Final A&D made in W.O.
2. Letter dated 7 June 1958, subject: "Wire Drag, Guemes Channel - Project CS 1-58", Position and sketch of the new pier in Fidalgo Bay. [L-393(1958)]
3. Tide marigrams and level records - April 1958
4. Smooth Sheet H - 8331 (Hydrography) (Seattle District Office)

Marvin T. Paulson
LCDR, C&GS

ATTACHMENTS:

1. Itemization of Drag Hangs and Clearances (Attachment No 1 filed with fathograms for A day. W.O. made effective depth diagrams filed with figs
2. Approval Sheet
3. Statistics
4. List of Signals
5. Tide Note
6. Print of Progress Sketch

Approved and forwarded (see approval sheet - Attachment No. 2).

Ira R. Rubottom
Commander, C&GS
Comdg., Ship PATHFINDER

OBSTRUCTIONS

Attachment 1

(Compiled in Washington Office)

Pos. No.	Location Latitude	Location Longitude	Hang Ft.	Sdg. Ft.	Cleared Eff. Depth Ft.	Remarks
28-36L	48°31.37'	122°39.65'	53		36	
28-36L	31.32'	39.62'	53		43	
24-33F	31.30'	39.54'	53		44	
1-13L	30.98'	39.90'	53		Not cleared	
41-49L	31.10'	39.52'	48		Not cleared	
1-9G	31.37'	39.29'	50		44	
12-21M	31.21'	39.16'	49		43	
35-40G	31.18'	39.10'	49		43	
18-32G 40-42D	31.28'	38.89'	50		47	
29-36D	31.40'	38.58'	52		39	
34-36F	31.15'	38.48'	43		42	
18-28C	31.46'	38.37'		38	Not cleared	Hung on sloping section 33-40 ft. Disregarded hang, plotted 38 sdg. at Pos. 29C
8-28D	31.40'	36.96'	42	51	41	Sdg. pos. 53d

OBSTRUCTIONS

(Compiled in Washington Office)

Pos. No.	Location Latitude	Location Longitude	Hang Ft.	Sdg. Ft.	Cleared Eff. Depth Ft.	Remarks
18-26E	48°31.36'	122°36.86'	37			Not cleared
1-7D	31.45'	36.35'	51		34	
58-82J	31.38'	36.07'	39		34	
1-14H	31.67'	35.81'	53			Not cleared
13-17C	31.56'	35.92'	51		51	
6-12E	31.37'	35.98'	50		40	
58-82J	31.32'	35.92'	50			Not cleared
11-19A	31.17'	34.88'	52	52		Sdg. 20a Temp. hang 52 ft.
11-19A	31.14'	34.83'	53		52	
39-50M	31.10'	34.77'	46	48	45	Sdg. 39b (Pg. 13 H Vessel)
23-29K	31.08'	34.94'	51		51	
1-13K	31.06'	34.78'	52		52	
30-32B	30.91'	34.60'	55		53	
35-46J	30.90'	34.82'	51		51	
47-57J	30.89'	34.90'	51		49	

OBSTRUCTIONS

(Compiled in Washington Office)

Pos. No.	Location		Hang Ft.	Sdg. Ft.	Cleared Eff. Depth Ft.	Remarks
	Latitude	Longitude				
47-57J	48°30.87'	122°34.94'	51		49	
35-46J	30.86'	34.78'	51		51	
47-57J	30.86'	35.26'	51		40	
126-136J	30.78'	34.91'	51		49	
126-136J	30.77'	34.89'	51		49	
126-136J	30.76'	34.97'	51		49	
23-33J	30.78'	34.57'	51		48	
23-33J	30.75'	34.58'	51		44	
23-33J	30.73'	34.66'	48		44	
23-33J	30.70'	34.66'	48		41	
17-22J	30.67'	34.60'	48		42	
17-22J	30.68'	34.52'	51		44	
118-124J	30.65'	34.38'	52		44	
10-13J	30.60'	34.29'	51		41	
99-115J	30.58'	34.30'	49		41	
1-8J	30.57'	33.91'	51			Not cleared

ATTACHMENT NO. 2

APPROVAL SHEET

This survey was conducted under the command of F. B. Quinn, Captain, who was confined to the U.S. Public Health Service Hospital at the time of completion of this report. It was his intent to review the smooth sheet and this report prior to shipment, but due to his confinement, this report is forwarded without his express comments. Since assuming command, I have not had an opportunity to give the smooth drafting of the survey more than a general review, but approve it as complete.

Ira R. Rubottom
Commander, C&GS
Comdg., Ship PATHFINDER

ATTACHMENT NO. 3

STATISTICS

CS-1-58 PF-1158WD H -

Vol	Day Ltr	Date	Positions	Stat. Miles Drag
1	a	8 April 1958	22	2.42
1	b	9 " "	36	3.00
1	c	10 " "	42	4.84
1	d	11 " "	56	3.00
1 & 2	e	12 " "	45	3.56
2	f	13 " "	44	4.84
2	g	14 " "	51	4.60
2	h	15 " "	37	3.00
3	j	16 " "	148	7.01
3	k	17 " "	55	3.56
4	l	30 " "	50	2.87
4	m	1 May "	104	2.87
4	n	2 May "	44	2.30
		13 days	724	47.87

Area - Square Statue Miles ____ 12.0

(Total number Vol. is 13.

Vol 1 - 4 Guide Launch
Vol 5 - 9 End Launch
Vol 10 - 13 Tender #1 & #2

All pertinent data transferred from records of End Launch & Tender Launch to Guide Launch with the exception of the following:

Location New Pier (Texas Co)	Vol 4	pp 55
Location Microwave Tower	Vol 12	pp 33
Sounding Line Along Causeway and Wharf (Texaco Pier)	Vol 12	pp 34 - 38
Sounding Line Along Shell Oil Wharf	Vol 12	pp 40 - 41

ATTACHMENT NO. 4

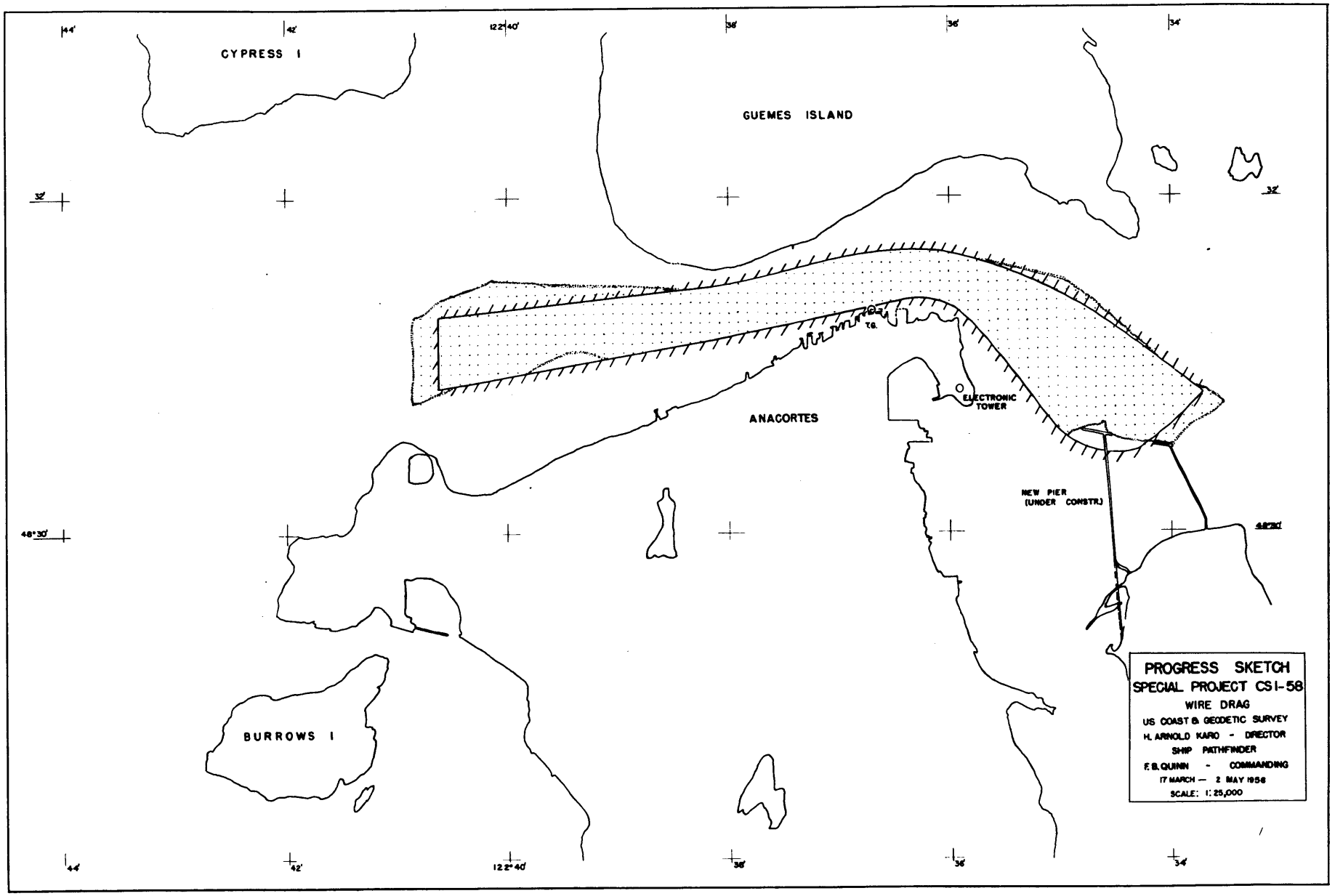
LIST OF SIGNALS FOR WIRE DRAG SHEET
PF - 1158 WD

Signal	Source
Axe	T-11229
Bat	T-11229
Bor	T-11228
BOX	ANACORTES, AMERICAN LUMBER and BOX CO., CONCRETE STACK, 1940
Chim	T-11229
CRUDE	ANACORTES REFINERY, SHELL OIL CO., CRUDE COLUMN, 1955
Cry	H-8331 (smooth sheet)
CUPO	(FERTILIZER PLANT WEST OF ANACORTES, CUPOLA, 1927)
DOCK, 1955	
Dok	H-8331
Dol	PF-1158 WD
Eva	T-11228
Ewe	H-8331 (smooth sheet)
Far	T-11228
FIDALGO N2	
Guy	T-11228
Gage (Tide Station)	T-11229
Ida	T-11229
Key	T-11228
LIGHT	MARCH POINT LIGHT, 1939
Liz	T-11229
Mal	T-11229
Microwave Tower	PF-1158 WD
Pad	T-11229
Pol	PF-1158 WD
Poi	PF-1158 WD
LY	ANACORTES PLYWOOD CO. STEEL STACK, 1940
POINT 1927	
Quo	T-11229
SHELL	SHELL 1955
Ship	Signal Tank 1953 on T sheet T-11228
SPIRE	ANACORTES, ST.MARY'S CHURCH SPIRE, 1940
Sox	T-11229
TANK	ANACORTES, MORRISON MILL CO., ELEVATED STEEL TANK, 1940
Tip	T-11229
Val	T-11229
Wee	T-11229
Wig	H-8331 (smooth sheet)
WOOD	WOOD-1927

ATTACHMENT NO. 5

TIDE NOTE:

The tide gage location is Lat. 48° 31.3', Long. 122° 36.75'. The hourly heights were scaled and reducers determined for each 0.2 ft. change. A value of 3.34 ft. on the tide staff was used as MLLW, determined from BM 11. No corrections were used as to height and time difference.


CYPRESS I
GUEMES ISLAND
ANACORTES
BURROWS I
ELECTRONIC TOWER
NEW PIER (UNDER CONSTR.)
PROGRESS SKETCH
SPECIAL PROJECT CSI-58
WIRE DRAG
US COAST & GEODETIC SURVEY
H. ARNOLD KARO - DIRECTOR
SHIP PATHFINDER
F. B. QUINN - COMMANDING
17 MARCH — 2 MAY 1958
SCALE: 1:25,000

Form 712
(11-30-55)

U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

Chart Division: R. H. Carstens:

17 September 1958

Plane of reference approved in
13 volumes of ~~sounding~~ wire drag records for

HYDROGRAPHIC SHEET 8431

Locality Guemes Channel, Washington

Chief of Party: F. B. Quinn in 1958

Plane of reference is mean lower low water, reading

3.3 ft. on tide staff at Anacortes

21.9 ft. below B.M. 11 (1934)

Height of mean high water above plane of reference is 7.4 feet.

Condition of records satisfactory except as noted below:

William Shofnos

Signature

Chief, Tides Branch

Comm-DC 34330

GEOGRAPHIC NAMES

Survey No. H-8431 W.D.

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	BGN K	
Washington			(for title)						BGN	1
Guemes Channel			"	"						2
Fidalgo Island										3
Fidalgo Bay										4
Anacortes			(tide station)							5
Guemes Island										6
Shannon Pt.				Names approved 10-7-58 L. Heck						7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

M 234

Form 946

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8431W.D.

Records accompanying survey: Smooth sheets ..1..;

boat sheets ..2..; sounding vols. .....; wire drag vols. ..13..;

Descriptive Reports ...1..; graphic recorder envelopes 15-Envelopes;

special reports, etc. .1-A&D Sheet to Accompany Smooth sheet.. 1-Supplement to A+D Overlay, 14-Overlays of Daily Drag Strips+1-Preliminary Overlay A+D Sheet.....

W.O. tracings filed with forms

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

		W.O.
Number of positions on sheet		724
Number of positions checked		174
Number of positions revised		22
Number of soundings revised (refers to depth only)		—
Number of soundings erroneously spaced		—
Number of signals erroneously plotted or transferred		0
Topographic details	Time	16
Junctions	Time	0
Verification of soundings from graphic record	Time	2
Special adjustments	Time	

(W.O.) Sue Geskind 507 2/19/59

Verification by D. R. Engle Total time 97 Date 2/2/59

Reviewed by Sue Geskind Time 25 Date 2/19/59

US COMM C&GS DC

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO.: H-8431 W.D. FIELD NO.: PF 1158 W.D.

Washington, Anacortes, Guemes Channel

Surveyed: March-May 1958 Scale: 1:10,000

Project No.: Spec. Proj. 1-58

Soundings: Control:

808 Fathometer Sextant fixes on shore signals

Chief of Party-------- F. B. Quinn
Surveyed by---------- M. Paulson, V. Kiisk, G. F. Wirth, D. Stark, P. Taetz, H. D. Nygren, and S. Baker
Protracted by--------- C. Ellis
Soundings plotted by-- C. Ellis
Verified and inked by- I. M. Zeskind and D. R. Engle
Reviewed by---------- I. M. Zeskind DATE: 10/7/59
Inspected by--------- R. H. Carstens

1. Shoreline and Control

The shoreline originates with reviewed air-photographic surveys T-11228, T-11229 and T-11231 of 1952-53, supplemented by revisions determined during the present season and shown on a copy of T-11229 accompanying the boat sheet.

The source of the control is given in the Descriptive Report.

2. Junctions with Wire Drag Surveys

No wire-drag surveys join the present survey.

3. Comparison with Hydrographic Surveys

H-1814 (1887), 1-10,000	H-4738 (1927), 1-5,000
H-1815 (1887), 1-10,000	F.E. 4 (1953), 1-5,000
H-4736 (1927), 1-5,000	*H-8331 (1955), 1-10,000
H-4737 (1927), 1-5,000	*H-8332 (1955), 1-10,000

*Unverified

Effective depths of the present wire drag survey do not conflict with depths on the above listed surveys, except for the following:

A wire drag set to an effective depth of 54 ft. cleared an 8.3 fm. sounding on the unverified survey H-8331 in lat. 48°30.66', long. 122°34.06'. A careful check of the hydrography on H-8331 in the vicinity of 8.3 fm. sounding indicates a 10.3 fm. sounding was erroneously penciled 8.3 fm. Additional verification of soundings in this area is deferred until survey H-8331 has been verified and reviewed.

4. Comparison with Chart 6376 (Latest print date 6-1-59)

A. Hydrography

The charted wire-drag data originates with the present wire drag survey after verification and before the completion of the review. There are no conflicts between the charted soundings and the effective wire-drag depths of the present survey.

B. Aids to Navigation

The locations of the floating aids to navigation were not obtained during the present survey. The present survey position of the fixed aid to navigation "March Point Light" is in agreement with the charted position and adequately marks the feature intended.

5. Condition of Survey

A. The Descriptive Report is complete. However, many changes in the information pertaining to drag hangs and clearances made during verification of the survey necessitated the compilation of a new list. This information was originally contained on Attachment No. 1, which was removed from the Descriptive Report and filed with the fathograms for A day, and in its stead, the new list has been inserted.

B. The information recorded in the wire-drag records is adequate except for the following:

1. No effective depth diagrams were drawn.

2. Signs indicating the direction of the angles between the signals and the end buoys were not recorded. Because of the foregoing one drag strip which was erroneously smooth-plotted had to be redrawn.

3. The 1/40th rule was not observed in recording the effective depths of inclined sections whose difference in lengths of uprights exceeded 2½% of the length of the section.

4. The rule which requires the deeper section between two inclined sections each leading to a lesser depth to be reduced to that of the deeper adjacent section, was not observed in recording the data in the wire-drag volumes.

5. The application of lift and tide corrections to length of upright was not completely recorded in the Guide Launch record.

C. The smooth sheet as received in the Washington Office was incomplete and the A and D sheet as previously stated had to be recompiled. Only the paths of the end buoys drawn in pencil were shown on the smooth sheet. In order to complete the smooth sheet and recompile a new A and D sheet, it was necessary to do the following:

1. Transfer the shoreline from the air-photographic surveys to the smooth sheet and ink same.

2. Subdivide sections of the wire-drag strips where necessary.

3. Make a tracing of each wire-drag strip.

4. Locate, encircle and ink all groundings.

5. Plot critical depths.

6. Ascertain cleared maximum depths over all obstructions. An obstruction sheet compiled during review is attached to the Descriptive Report.

D. The following deficiencies in the survey were noted:

1. No fixes or cuts were taken to many of the groundings.

2. Sections of the drag were not rejected where

the drag scraped or bounced along the bottom.

3. An insufficient number of lift tests were made.

4. Lift tests showed sag of as much as 6 ft. in the drags. This sag was attributed to too small toggle floats being used during the early part of the survey, the action of the current on the bottom wire, or because of insufficient tension on the drag while being pulled through the water.

5. Recorded fixes of groundings sometimes were in disagreement with the locations of the groundings as determined by the bights of the drags.

6. Project Instructions

The survey adequately complies with the Project Instructions, except in several small areas where Guemes Channel was dragged to effective depths of 45 ft. to 49 ft. The Project Instructions called for the channel to be dragged to effective depths of 50 ft. Deficiencies in operations, reduction of records, and smooth plotting are listed in Item 5.

7. Additional Field Work Recommended

Deficiencies in the wire-drag survey caused by either conflicting or inadequate information in the wire-drag records were resolved by adopting the most conservative interpretation of the available information. Some of the groundings and effective depths may be somewhat approximate because of deficiencies in survey operations and recorded data, and should not be regarded as of standard wire-drag reliability.

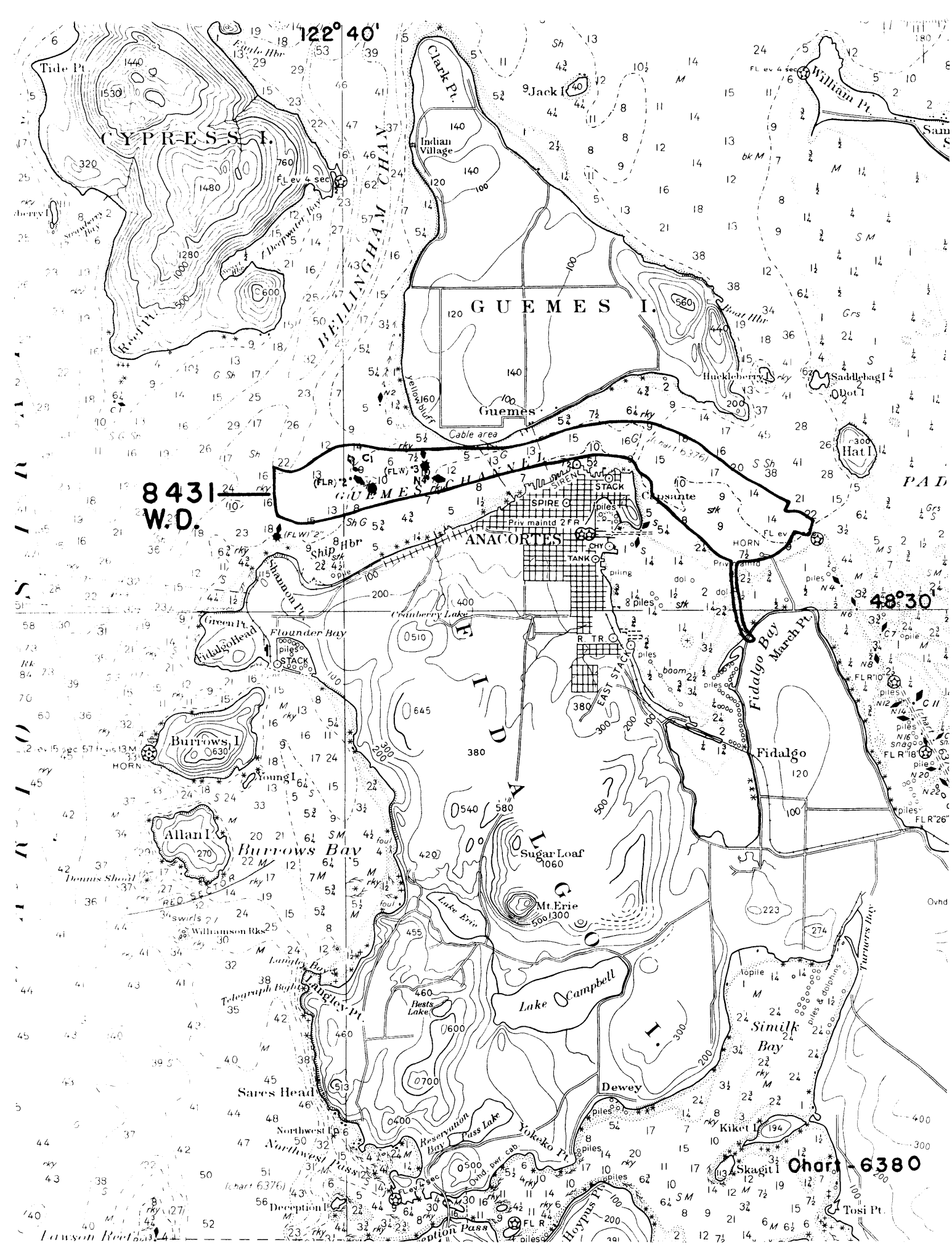
Examined and approved:

Max G. Ricketts
Chief, Nautical Chart Branch

Ernest B. Lewey
Chief, Division of Charts

Lorin F. Woodcock
Chief, Hydrography Branch

Samuel B. Grenell
Chief, Division of Coastal Surveys


122° 40'
48°30'
CYPRESS I.
GUEMES I.
Guemes
Cable area
GUEMES CHANNEL
8431
W.D.
ANACORTES
Cranberry Lake
Tide Pt
Clark Pt.
Jack I
Indian Village
William Pt.
Huckleberry I
Saddlebag I
Hat I
Cap Sante
SPIRE
STACK
SIREN
TANK
CHY
HORN
Priv maintd 2 FR
Ship Hbr
Shannon Pt.
Green Pt.
Fidalgo Head
Flounder Bay
Burrows I
Young I
Allan I
Burrows Bay
Sugar Loaf
1060
Mt Erie
1300
Lake Campbell
Lake Erie
Fidalgo Bay
March Pt.
Fidalgo
EAST STACK
R TR
Langley Pt.
Langley Bay
Telegraph Bight
Sares Head
Dewey
Similk Bay
Kiket I
Skagit I
Yokeko Pt.
Reservation Bay
Pass Lake
Northwest Pass
Deception I
Deception Pass
Hoypus Pt.
Tosi Pt.
Turners Bay
Lawson Reef
Reef Pt.
Eagle Hbr
Deepwater bay
Yellow bluff
Boat Hbr
Chart - 6380

NAUTICAL CHARTS BRANCH

SURVEY NO. H-8431 W.D.

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
2-26-59	6376	R.E. Elkins	Partly applied ~~Before~~ After Verification and Review after Review - before inspection
7-1-59	6380	m. Rogers	completely applied ~~Before~~ After Verification and Review in conjunction with Chart 6376, drawing # 12 and H-8331 (not ver.)
7-7-59	6300	m. Rogers	completely applied ~~Before~~ After Verification and Review thru chart 6380
3/21/60	6376	W Evans Jr	~~Before~~ After Verification and Review Final revisions after review - completely applied.
2-7-78	18429	Hamilton RCV	Fully applied ~~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.