8321

Diag. Cht. No. 6380-2.

Form 504

U. S. DEPARTMENT OF COMMERCE

COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. LJ-1356 *Office No.* H-8321

LOCALITY

State Washington

General locality Bellingham Bay

Locality Hale Passage to Lummi Bay

1956

CHIEF OF PARTY

K. B. Jeffers

LIBRARY & ARCHIVES

DATE May 4, 1960

USCOMM-DC 5087

8321

Form 537
(Ed. June 1946)

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-8321

Field No. LJ-1356

State WASHINGTON

General locality BELLINGHAM BAY ~~AREA~~

Locality HALE PASSAGE to LUMMI BAY

Scale 1:10,000 Date of survey 6/9/56-8/12/56

Instructions dated 24 OCTOBER 1956

Vessel SHIP LESTER JONES

Chief of party K. B. JEFFERS

Surveyed by J. J. DERMODY & R. MANSFIELD

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

Fathograms scaled by SHIP PERSONNEL

Fathograms checked by SHIP PERSONNEL

Protracted by Clarence R. Lehman

Soundings penciled by Clarence R. Lehman

Soundings in ~~fathoms~~ feet at ~~MLW~~ MLLW

REMARKS:

U. S. GOVERNMENT PRINTING OFFICE 16—66520-1

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY H-8321 (FIELD NO. LJ-1356)
WEST BELLINGHAM BAY & HALE PASSAGE, WASH.
SCALE 1:10,000 SHIP LESTER JONES K.B.JEFFERS, Comdg.
SURVEYED BY: J. J. DERMODY & RICHARD MANSFIELD

A. PROJECT:

This survey is part of Project 12410 and was executed under supplemental instructions No. 22/MEK S-2-LJ dated 24 October 1955.

B. SURVEY LIMITES & DATES:

General locality: NW Bellingham Bay, Portage Bay (new name) and Hale Passage to Lummi Bay.

Field work began on 9 June and ended on 12 August 1956.

This survey is joined on the east by H-8320 (LJ-1256), on the south by H-8319 (LJ-1156), and on the northwest by H-8323 (LJ-1556).

Progress was impeded by lack of power and poor design of Launch 176.

C. VESSEL & EQUIPMENT:

All hydrography was done by Launch 176 using 808 fathometers No. 102-S and 107-S with reed tachometer calibrated for a speed of sound at 800 fathoms per second.

D. TIDE & CURRENT STATIONS:

Two portable tide gages were maintained during the time of this survey; one at the head of the Whatcom Waterway, City of Bellingham, Lat. 48-45.04 N, Long. 122-29.02 W; the other at Fishermans Cove, Hale Passage, Lat. 48-43.9 N, Long. 122-40.2 W.

The Bellingham gage was used without time or height corrections for all soundings through "g" day, 25 July.

The Fishermans Cove gage was used without time or height corrections for all soundings thereafter, starting with "h" day, 27 July.

The time of tide at Fishermans Cove is 10 minutes later than that for Bellingham and the range is the same for the two stations (Cf. Assistant Director's letter 36-455-982 elj dated 25 September 1956).

No current stations were observed within the limits of this survey.

E. SMOOTH SHEET:

The smooth sheet is to be plotted by the Seattle Processing Office - their addenda report will be attached to this report.

F. CONTROL STATIONS:

The following triangulation stations were used as hydro signals:

ABNER, 1956	ABNER
BEACH, 1956	BEA
CANDY, 1956	CANDY
CLAM, 1956 (old topo)	CLAM
EASEL, 1956	EASEL
FRANCES 2 (USE), 1940	FRAN
GORDON, 1956	GOR
GRAVE, 1956	GRAVE
HATCH, 1956	HAT
IMMUL, 1956	MUL
JOHAN, 1956	HAN

JOHN 3 (USE), 1941	JOHN
MIG, 1941	MIG
SANDY, 1949	SAND
SOLON, 1956	SOLON

The following Recoverable Topographic Stations were used as hydro signals: CAG
~~CAGE, 1949~~
LUMI, 1949

The signals north of Lat. 48-45 were located by standard photogrammetric methods or by theodolite cuts. - Photo Manuscript - T-5584-S and T-5583-S.

The signals south of 48°45' were located by standard graphic control methods on sheet LJ-B-56 and LJ-C-56.

A few signals were located by sextant cuts from offshore.

G. SHORELINE & TOPOGRAPHY:

Shoreline north of 48-45 is from photogrammetric sheets T-5584-S and T-5583-S.

Other shoreline is from old 1888 topo survey sheets T-1797 and T-1871. A shoreline holiday exists between T-1797 and T-5584-S on the east shore of Lummi Indian Reservation. The HWL from the old topo survey was spot checked on the graphic control sheets LJ-B and C-56. Subsequently photogrammetrically controlled

Where possible and pertinent, the low water line was delineated by hydrography. The 9-lens photos of this area will aid in a more detailed delineation of the extensive boulder strewn shoal area, and the meandering channels thru Lummi Flats.

H. SOUNDINGS:

All echo soundings were taken by Launch 176 using 808 fathometers No. 102-S and 107-S.

Pole soundings were taken when possible in the grassy areas of Portage Bay and Hale Passage to help in correct interpretation of the fathograms.

The correct scanning of the fathograms in these areas is difficult, since no combination of gain and needle settings would bring in the bottom echo thru the thick grass.

See Special Fathometer Report submitted by the Ship LESTER JONES in 1956.

Bar checks were taken twice daily, weather and sea permitting.

Attached to this report are abstracts of velocity corrections and of fathometer corrections.

I. CONTROL OF HYDROGRAPHY:

All hydrography was controlled by sextant angles on shore objects.

Wherever strong currents were encountered especially in Hale Passage, an attempt was made to run visual ranges; therefore, slight discrepancies exist in the spacing between fixes.

J. ADEQUACY OF SURVEY:

This survey is complete and adequate to supersede all prior surveys.

Junctions with contemporary surveys are adequate and depth curves can be joined.

There are no holidays.

K. CROSSLINES:

Approximately 8% of the lines run are crosslines. Crossed soundings agree adequately on the boat sheet.

L. COMPARISON WITH PRIOR SURVEYS:

Soundings from H-1887 (1888 - 1:20,000) and H-1953 (1889 - 1:20,000) were compared with contemporary soundings, and, in general, agree adequately on the boat sheet.

M. COMPARISON WITH CHART:

Soundings from Chart 6378 compare, in general, favorably with contemporary soundings on the boat sheet.

The bar in NW Hale Passage is now slightly shoaler than charted.

N. DANGERS & SHOALS:

Dangers to navigation on this survey consist of shoal sand bars which are adequately delineated by the depth curves in all instances.

O. COAST PILOT INFORMATION:

See special Coast Pilot Report submitted by Ship LESTER JONES in 1956.

P. AIDS TO NAVIGATION:

The following floating aids to navigation within the survey limits are more or less in charted position:

Point Frances Shoal Buoy 2 (CG 162, page 180)
Point Frances Shaol Buoy 4 (CG 162, page 180
Lummi Point Light Buoy 5 (CG 162, #1937)

The 5 spar buoys in Portage Channel which were privately maintained by the Foss Tug Co. (CG 162, page 180) have been permanently discontinued.

There are two underwater cable crossings in Hale Passage. The signs marking the termini of each have been located either on LJ-B & C-56 or on the boat sheet.

They ferry piers in Hale Passage are hydro signals DES and SED.

{These signals are listed with other control signals in volume 1 and originate with LJ-C-56 (Graphic control survey).

Q. LANDMARKS FOR CHARTS:

The "TREE" charted on Sandy Pt. is correct. The large building referred to in the Coast Pilot as being conspicuous on Lummi Point no longer exists.

R. GEOGRAPHIC NAMES:

See special geographic names report submitted by this vessel in 1956.

Charted names in the area are correct.

The shoal bay north of Pt. Frances is known locally as "Portage Bay", the channel between it and Bellingham Bay as "Portage Channel" (Cf. CG 162, page 180), and the narrow passage which bares at low water between this bay and Hale Passage is called "The Portage". Since this is much used by small craft at high water, recommend to CHART at least one of these names.

The bight south of Gooseberry Pt. in Hale Passage is known locally as Fishermans Cove. It is much used as an anchorage during the fishing season, Recommend to CHART this name.

S. SILTED AREAS:

Portage Bay and Lummi Bay are heavily silted areas. Currents thru

Hale Passage seem to scour the bottom of silt. The bar across the north end of Hale Passage seems to be slowly building; it is caused by the joining of the flood current thru Hale Passage and the flood thru Rosario Strait which bends around Pt. Migely. At flood tide there is a current streak over this bar. The smooth plot will adequately delineate these features.

Z. TABULATION OF APPLICABLE DATA:

1956 Coast Pilot Report	forwarded to Wash. Office
1956 Geographic Names Report	" " " "
1956 Fathometer Report	" " " "
1956 Magnetic Data	" " " "
1956 Tide Data	" " " "
1956 Landmarks for Charts Data	" " " "
Graphic Control Sheets & Report	" to Seattle Proc.Office
Tide Curves & Tide Reducers	" " " " "
* Photogrammetric Data and Report	" " ~~Portland Photo.~~ "

* included with 1956 hydrographic records

Respectfully submitted,

John J. Dermody,
Lieutenant (j.g.), C&GS

APPROVAL SHEET

This survey was done under the supervision of the Chief of Party. Applicable records and the boat sheet have been inspected and deemed complete and adequate to supersed all prior surveys.

G. C. MAST,
COMMANDER, C&GS
CHIEF OF PARTY

STATISTICS FOR HYDROGRAPHIC SURVEY
H-8321 (LJ-1356) - 1956
SHIP LESTER JONES PROJECT 12410

DATE	VOL.	DAY LTR.	POS.	STAT. MILES	L.L.SNDGS.
LAUNCH 176					
12 July	1	a	15	2.2	- -
20 July	1	b	190	26.6	- -
21 July	1 & 2	c	189	30.1	- -
22 July	2 & 3	d	224	36.8	- -
23 July	3 & 4	e	217	34.9	- -
24 July	4	f	128	19.4	- -
25 July	4 & 5	g	141	19.8	- -
27 July	5	h	~~191~~ 189	28.2	2
28 July	5 & 6	j	170	26.4	- -
29 July	6	k	152	20.2	1
7 Aug.	7	l	127	18.0	- -
8 Aug.	7 & 8	m	195	35.2	- -
9 Aug.	8	n	211	34.5	- -
11 Aug.	9	p	177	29.0	- -
12 Aug.	9	q	72	10.1	1
TOTALS			~~2,399~~ 2,397	371.4	4
SKIFF					
9 June	~~1~~ 2	a	22	- -	22
11 July	~~1~~ 2	b	~~8~~ 42	- -	8
9 Aug.	9	c	5	- -	5
TOTALS			~~35~~ 69		35

Grand Total 2,466

ALPHABETICAL LIST OF SIGNALS LJ-1356

NAME	SOURCE
ABNER	ABNER, 1956
AID	LJ-C-56
AMP	LJ-C-56
BAR	T-5584-S
BAY	LJ-C-56
BEA	BEACH, 1956
BIB	LJ-C-56
BOT	LJ-C-56
BUN	LJ-C-56
BUT	LJ-C-56
CAG	T-5584-S
CAM	LJ-C-56
CAN	CANDY, 1956
CHI	LJ-C-56
CLAM	CLAM, 1956
COT	LJ-C-56
CRO	LJ-C-56
CROSS ✗	Vol. 16 pgs. 41 & 42
DAB	LJ-C-56
DAR	LJ-C-56
DES	LJ-C-56
DRY	LJ-B-56
DUS	LJ-B-56
EASEL	EASEL, 1956
ERA	LJ-C-56
EVA	LJ-B-56
FAN	LJ-C-56
FEE	LJ-C-56
FEN	LJ-C-56
FRAN	FRANCES 2 (USE),1940
FUR	LJ-B-56
GIB	LJ-B-56
GIF	LJ-C-56
GOB	LJ-B-56
GOR	GORDON, 1956
GOT	LJ-D-56
HAL	LJ-B-56
HAN	JOHAN, 1956
HAT	HATCH, 1956
HAV	LJ-C-56
HIE	LJ-C-56
HIT	LJ-D-56
HOY	LJ-B-56
HUB	LJ-C-56
ILK	LJ-B-56
ITO	LJ-B-56
JIG	LJ-56-B
JOB	LJ-D-56
JOHN	JOHN 3 (USE),1941
KAY	LJ-B-56
KEN	LJ-D-56
LAS	LJ-C-56
LIM	LJ-D-56
LOM	LJ-B-56

NAME	SOURCE
LON	LJ-D-56
LOP	LJ-B-56
LUF ✗	Vol. 1 7 pgs 38 & 42
LUG	LJ-C-56
LUMI	LUMI, 1951
MAY	LJ-C-56
MIG	MIG, 1941
MIN	LJ-C-56
MUD	LJ-B-56
MUL	IMMUL, 1956
NIB	LJ-C-56
NIL	LJ-B-56
NIP	LJ-D-56
NIT	LJ-C-56
ORA	LJ-C-56
ORE	LJ-B-56
PED	LJ-D-56
PET	LJ-C-56
PIE	LJ-B-56
PRO	LJ-C-56
QUI	LJ-C-56
RAN	LJ-C-56
RAV	LJ-D-56
RIB	LJ-C-56
RID	LJ-B-56
ROB	LJ-C-56
SAND	SANDY, 1949
SAR	not used (LJ-C-56)
SAY	LJ-B-56
SED	LJ-C-56
SEE	LJ-C-56
SOB ✗	Vol. 17 pg. 4
SOLON	not used - 1956
SON	LJ-C-56
SUD	LJ-D-56
TAB	LJ-C-56
TAM	LJ-B-56
TAW	LJ-C-56
UBA	LJ-B-56
VAG	LJ-B-56
VOO	LJ-C-56
WOE	LJ-B-56
WIS	LJ-B-56
WOO ✗	Vol. 17 pg. 4
"X" ✗	Vol. 1 pgs. 9 & 19
YAR	LJ-C-56
YEW	LJ-B-56
ZIL ✗	Vol. 1 pgs. 16 & 33

[illegible] ZONE

1956 FATHOMETER CORRECTIONS

(Derived from Bar Check and Serial Data - 1956)

SHIP - FATHOMS

April

+ 0.3	0	to	16
+ 0.4	16	to	45
+ 0.5	45	to	70

MAY - JUNE

+ 0.3	0	to	7
+ 0.4	7	to	18
+ 0.5	18	to	28
+ 0.6	28	to	38
+ 0.7	38	to	48
+ 0.8	48	to	58
+ 0.9	58	to	68

JULY - SEPT.

+ 0.3	0	to	5
+ 0.4	5	to	11
+ 0.5	11	to	19
+ 0.6	19	to	27
+ 0.7	27	to	35
+ 0.8	35	to	43
+ 0.9	43	to	50
+ 1.0	50	to	58
+ 1.1	58	to	66
+ 1.2	66	to	74

OCT. - NOV.

+ 0.3	0	to	7
+ 0.4	7	to	17
+ 0.5	17	to	26
+ 0.6	26	to	36
+ 0.7	36	to	46
+ 0.8	46	to	57
+ 0.9	57	to	67

LAUNCH - FATHOMS

April

+ 0.3	0	to	5
+0.2	5	to	25
+ 0.3	25	to	54
+ 0.4	54	to	75

MAY - JUNE

+ 0.2	0	to	15.3
+ 0.3	15.3	to	25.5
+ 0.4	25.5	to	35.7
+ 0.5	35.7	to	45.7
+ 0.6	45.7	to	55
+ 0.7	55	to	66
+ 0.8	66	to	76

JULY - SEPT.

+ 0.2	0	to	9.5
+ 0.3	9.5	to	18.0
+ 0.4	18.0	to	26.0
+ 0.5	26.0	to	35.0
+ 0.6	35.0	to	43.0
+ 0.7	43.0	to	51.0
+ 0.8	51.0	to	59.0
+ 0.9	59.0	to	67.0
+ 1.0	67.0	to	75.0

OCT. - NOV.

+ 0.2	0	to	6.0
+ 0.3	6.0	to	16.0
+ 0.4	16	to	26
+ 0.5	26	to	36
+0.6	36	to	46
+ 0.7	46	to	56
+ 0.8	56	to	66
+ 0.9	66	to	76

LAUNCH - FEET

April

+ 1.4	0	to	28
+ 1.6	28	to	75

MAY - JUNE

+ 0.8	0	to	14
+ 1.0	14	to	23
+ 1.2	23	to	32
+ 1.4	32	to	55

JULY - SEPT.

+ 1.0	0	to	7
+ 1.2	7	to	19
+ 1.4	19	to	31
+ 1.6	31	to	43
+ 1.8	43	to	55

OCT. - NOV.

+ 1.2	0	to	13
+ 1.4	13	to	25
+ 1.6	25	to	38
+ 1.8	38	to	Rest of A Scale

PHASE

Fathometer

Number	B "SCALE" (A-8)
75	- 0.3
102-S	- 2.5 fms.
107-S	- 1.5

USC&GSS LESTER JONES
1956 VELOCITY CORRECTION ABSTRACT
FROM
SERIAL TEMPERATURES

Applicable Depth	April	May	June	July	Aug.	Sept.	Oct.	Nov.
	Corrections in Fathoms							
7	+ 0.02	+0.05	+0.05	+0.06	+0.09	+0.07	+0.06	+0.05
12	+0.04	+0.10	+0.10	+0.12	+0.16	+0.14	+0.12	+0.09
17	+0.05	+0.15	+0.15	+0.18	+0.23	+0.21	+0.17	+0.14
22	+0.07	+0.19	+0.20	+0.25	+0.30	+0.28	+0.23	+0.18
27	+0.09	+0.24	+0.25		+0.36	+0.34	+0.29	
32	+0.11	+0.29	+0.30		+0.43	+0.41	+0.35	
37	+0.13	+0.34	+0.35		+0.49	+0.47	+0.40	
42	+0.14	+0.38	+0.40		+0.56	+0.54	+0.46	
47	+0.16	+0.43	+0.45		+0.62	+0.60	+0.51	
52	+0.18	+0.47	+0.50		+0.68	+0.66	+0.56	
57		+0.52	+0.55		+0.75	+0.73	+0.61	
62		+0.56				+0.79	+0.66	
67		+0.61						

NOTE: The above values are velocity corrections based solely on monthly serials. They were combined with Bar Check and Draft data to obtain the final fathometer corrections.

PROCESSING OFFICE NOTES H-8321

SMOOTH SHEET

The smooth sheet was hand constructed by the Seattle Hydrographic Processing Unit using standard methods of construction and checking.

SHORELINE AND TOPOGRAPHY

The shoreline was taken from the same sources as the boat sheet except that the shoreline for the holiday, mentioned in the field report, between T-1797 (1883) and T-5584S was taken from ~~T-1798 (1887)~~ 1871 (1888).

CONTROL OF HYDROGRAPHY

Approximately 25% of the positions on this sheet were plotted by protractor. The balance of the positions were transferred from film positives of the boat sheet.

ADEQUACY OF SURVEY

The survey is complete and adequate for charting.

The junctions with H-8319 and H-8320 have been compared and found satisfactory. The junction with H-8323 will be compared when that sheet is completed.

The depth curves at the compared junctions can be adequately drawn.

COMPARISON WITH CHART

A comparison with Chart 6378, 12th Ed. dated Feb. 8, 1960 has been made.

See section of Chart for comparison with smooth sheet.

The 3 fm curve shown in blue on the chart section includes depths to 3.2 fms.

DANGERS AND SHOALS

2.2 (106 m) To N

At Lat. 48° 41'.13, Long. 122° 36'.0, there is a 2.8 fm sounding.

Respectfully submitted,

William M. Martin

WILLIAM M. MARTIN
Superv. Carto. C&GS

APPROVED & FORWARDED:

G. C. Mast

G. C. MAST, CAPT., C&GS
SEATTLE DISTRICT OFFICER

RHC

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Coastal Surveys~~ June 17, 1960

Division of Charts: R. H. Carstens

Plane of reference approved in
9 volumes of sounding records for

HYDROGRAPHIC SHEET 8321

Locality Bellingham Bay, Washington

Chief of Party: K. B. Jeffers in 1956
Plane of reference is mean lower low water, reading
3.4 ft. on tide staff at Bellingham
28.0 ft. below B. M. 2 (1914)

3.0 ft. on tide staff at Gooseberry Point
14.7 ft. below B.M. 3 (1952)

Height of mean high water above plane of reference is 7.8 feet.

Condition of records satisfactory except as noted below:

William Shofnos
Chief, Tides Branch
~~Chief, Division of Charts~~

U. S. GOVERNMENT PRINTING OFFICE 877933

FORM 537a
(9-24-47)

DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

GRAPHIC CONTROL
~~TOPOGRAPHIC~~ TITLE SHEET

REGISTER NO. T -

FIELD NO. LJ-A-56 thru LJ-G-56

Each Planetable and Graphic Control Sheet should be accompanied by this form, completed so far as practicable, when forwarded to the Washington Office.

STATE	WASHINGTON
GENERAL LOCALITY	WASHINGTON COAST & SAN JUAN ISLANDS
LOCALITY	SAMISH BAY - HALE PASSAGE - ORCAS I.
SCALE 1:10,000	DATE OF SURVEY _____, 19____
VESSEL	SHIP LESTER JONES
CHIEF OF PARTY	K. B. JEFFERS & G. C. MAST
SURVEYED BY	P. A. STARK & J. J. DERMODY
INKED BY	P. A. STARK & J. J. DERMODY

HEIGHTS IN FEET ABOVE MHW OR_____ ☐ TO GROUND ☐ TO TOPS OF TREES

CONTOUR NONE APPROXIMATE CONTOUR FORM LINE INTERVAL_____FEET

PROJECT NUMBER 12410

REMARKS

Sheets used only for graphic control and spot check of shoreline.
No vertical control or contouring done.

12136

GRAPHIC CONTROL SHEET
SHEET LJ-A-56 to LJ-G-56
WASHINGTON COAST
PROJECT 12410 1956 FIELD SEASON
SHIP LESTER JONES K.B.JEFFERS & G.C.MAST,Comdg.

INSTRUCTIONS:

This work was done in accordance with Supplemental Instructions - Project 12410, Ref. 22/MEK, S-2-LJ, dated 24 October 1955.

SURVEY LIMITS:

Sheet No.	Latitude	Longitude
LJ-A-56	48-32.6 to 48-35.7	122-29.0 to 122-35.0
LJ-B-56	48-39.5 to 48-42.5	122-35.0 to 122-41.0
LJ-C-56	48-42.0 to 48-45.1	122-36.0 to 122-42.0
LJ-D-56	48-42.3 to 48-45.4	122-40.0 to 122-46.0
LJ-E-56	48-41.2 to 48-45.3	122-48.9 to 122-53.6
LJ-F-56	48-37.9 to 48-42.0	122-51.2 to 122-55.9
LJ-G-56	48-34.5 to 48-38.5	122-48.8 to 122-53.5

CONTROL:

Control for all sheets was second and third order triangulation which was of sufficient density to provide adequate intersection of most of the hydrographic signals. In the few instances where traverses were necessary, they were short and no difficulty was encountered in closures and adjustments. Check cuts were taken to all signals located by a single rod reading. No "jumps" occurred during hydrography by the use of any signal located by graphic control.

SHORELINE:

The shoreline encompassed by these sheets has been previously located by other topographic surveys. These were traced on the new sheets by either the Blue-line or Dri-rite method to facilitate the checking of the shoreline. The datum adjustments on the old sheets were accurate, but as indicated in the Instructions, there were some variations in scale due to distortion of the original sheets.

The shoreline was predominantly rocky and minor changes were usually found only in areas containing sand spits and new waterfront construction. Changes, additions and shoreline checks by actual rodding were inked on the sheets with appropriate notes and require no further explanation. Where changes were encountered, the shoreline was traversed to a point of agreement. The majority of signals were built along the high water line and their location served as an additional check on the shoreline.

The entire area has excellent air photographic coverage which may be referred to in the event further information is desired.

MISCELLANEOUS:

Coast Pilot Data, Landmarks for Charts, Magnetics, Geographic Names, etc., are covered in the applicable sections of the Hydrographic Reports, and in the special reports on Geographic Names and Coast Pilot data.

Sheets LJ-A-56 through LJ-E-56 will be turned over to the Seattle Processing Office. Sheets LJ-F-56 and LJ-G-56 for East Sound will be turned over to the Ship PATTON for use in the completion of the Hydrographic Boat Sheet LJ-1656.

Respectfully submitted,

Pentti A. Stark

Pentti A. Stark,
Lieutenant, C&GS

Approved & forwarded:

G. C. Mast,
Commander, C&GS
Chief of Party

OFFICE OF CARTOGRAPHY

REVIEW SECTION -- NAUTICAL CHART DIVISION

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-8321 FIELD NO. LJ-1356

Washington, Bellingham Bay, Hale Passage to Lummi Bay

SURVEYED: June 9 - August 12, 1956 SCALE: 1:10,000

PROJECT NO. 12410

SOUNDINGS: 808 Depth Recorders CONTROL: Sextant angles on shore objects

Chief of Party----------K. B. Jeffers
Surveyed by----------J. J. Dermody and R. Mansfield
Protracted by----------C. R. Lehman
Soundings plotted by----------C. R. Lehman
Verified and inked by----------A. K. Schugeld and George Merrill
Reviewed by----------L. S. Straw
Inspected by----------R. H. Carstens

Date: January 30, 1963

1. Description of the Area

This survey is north of Lummi Island and covers Hale Passage which connects Lummi Bay and Bellingham Bay.

A large part of Lummi Bay is a huge mud flat bare at low tide. Portions of the shores of Hale Passage are foul with many scattered boulders and rocky ledges obscured in some places by grass and kelp. There are, however, several reaches of sand beach relatively free of rocks within the area covered by the present survey. Depths through the passage range from about 3 to 19 fathoms.

Small craft may make a short cut at high tide through Portage Bay between Bellingham Bay and Hale Passage.

Within the limits of this survey, the mud flats in Bellingham Bay extend southward from the mouth of the Nooksack River to

approximately lat. 48°45'00" where the depths increase from 0 to 3 fathoms abruptly.

Principally because of strong currents in this region, the sand spits in lat. 48°43.62' long. 122°38.0' and 48°43.25' long. 122°37.9' respectively are subject to change.

2. Control and Shoreline

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

North of 48°45'00" the shoreline originates with reviewed photogrammetric surveys T-5583-S and T-5584-S of 1949-52. The authority for the shoreline south of this line is T-1797 (1887) and T-1871 (1888). The high-water line on the old topographic surveys was spot checked by graphic control surveys LJ-A-56 through LJ-G-56 (Descriptive Report filed with Descriptive Report H-8321). Where differences in shoreline occurred, the shoreline inked in black on the graphic control surveys was transferred to H-8321 and inked in red.

3. Hydrography

The bottom configuration was well developed, and the depths at sounding line crossings are in good agreement.

Dangerous rocky reefs and boulder strewn beaches prevented complete development of the low-water line in Hale Passage, Lummi and Bellingham Bays below approximately lat. 48°44'45". Sounding lines should have been run in Lummi Bay from a half to three quarters of a mile farther northeastward to develop the low-water line. Where practical, soundings from prior hydrographic surveys and the low-water line from prior topographic surveys have been carried forward in order to supplement the present low-water line. All other depth curves have been adequately developed. A few bottom characteristics have also been carried forward to augment those on the present survey, particularly on some of the shoal features.

4. Condition of Survey

a. The low-water line was not developed in Lummi Bay (see paragraph 3 of this review).

b. The pier and dolphins at the south terminal of the Lummi Island ferry and the dolphins at the north terminal at Gooseberry Pt. are not shown on the present survey. They should be completely charted from C.L. 724 (1950) and C&GS 1960 photographs Nos. 26 Apr 60 S2605-06; and 26 Apr 60 S2596-97 which are two sets of stereo pairs.

c. Except as noted in sub-paragraphs a and b above the field plotting, records and the Descriptive Report adequately conform to the requirements of the Hydrographic Manual.

5. Junctions

The junction with H-8320 (1956) on the east was considered adequate in the review of that survey. The junctions on the west between Pt. Migley and Sandy Pt. (H-8323-1956) and at the east entrance to Hale Passage along lat. 48°41'00 (H-8319-1956) will be considered in the reviews of those surveys.

6. Comparison with Prior Surveys

H-405 (1853) 1:200,000 (Reconnaissance)
H-502 (1855) 1:20,000
H-708 (1858) 1:20,000
H-709 (1858-59) 1:10,000
H-1887(1888) 1:20,000
H-1953 (1889) 1:20,000

Portions of these surveys combined cover the area of the present survey.

Considerable shoaling caused by heavy silting is evident in the northern part of Bellingham Bay. The delta of the Nooksack River as outlined by the low-water curve has built out progressively southward from one half to three quarters of a mile and the siltage is 15 to 18 feet deeper along the present low-water curve than it was in 1888 (H-1887). The shoaling continues into deeper water, but at a gradually reduced rate until the five-fathom curve is reached. There are no significant changes in the bottom at depths of five fathoms or greater.

It is noted also that there has been no change in depths on the hard and rocky shoals in lat. 48°44.15' long. 122°36.9' and 48°43.7' long. 122°36.35', and that the prior surveys show numerous bottom characteristics of soft and or green

mud over the bottom of Bellingham Bay.

Portage Bay has shoaled in some places about two feet with minor changes in the configuration of the bottom.

Sand and mud flats are exposed over half of Lummi Bay at low tide. A comparison of prior survey H-1953 (1889) with the present work reveals practically no change in depths over the mud flats at high water or any appreciable change in the extent of the area exposed at low tide. Therefore, where the low-water line was not developed on the present survey, sufficient soundings were carried forward from H-1953 (1889) to delineate the low water curve. Considering the difference in methods of surveying the depths in Hale Passage on the present survey are in close agreement with the prior survey (H-1953)(1889). It is apparent that nearly all of the sedimentary material that enters Hale Passage is carried on through to greater depths beyond the entrances by the strong currents. The most unusual feature in Hale Passage is the 2-to 3-fathom bar extending north nearly across the channel from Lummi Pt. This bar has changed very little either in depths over it or in configuration the past 73 years.

The present survey with the additional indicated information from prior surveys is adequate to supersede all of the prior surveys in the common area.

7. Comparison with Chart 6378 (Latest print date 5/22/61)

A. Hydrography

The charted hydrography originates with the prior surveys discussed in paragraph 6 of this review and with partial application of the present survey from copies of the boat sheet. Displacement of the charted depths has resulted because of using integral fathoms in the application of soundings from the copies of the boat sheet. The elevation of some rocks were revised during verification and review of the present survey and the chart should be corrected accordingly.

B. Topography

Except for the location and elevations of some rocks mentioned in paragraph A above, the row of piling charted

from subsequent photography in lat. 48°45.6' long. 122°36.42', the ferry slips and ferry dock at Gooseberry Pt. and Lummi Island, the charted shoreline is from 1887 to 1888 topographic surveys.

C. Aids to Navigation

The aids to navigation are in substantial agreement with the charted positions, except that the red N buoy "4" charted in lat. 48°41.7' long. 122°38.2' was located on the present survey 200 m. northeast of the charted position. This buoy as charted the flashing white buoy off Lummi Pt. and the red N "2" off Pt. Frances adequately mark the features intended.

8. Compliance with Instructions

The survey adequately complies with the project instructions.

9. Additional Field Work

This survey is considered basic and no additional field work is recommended.

Examined and Approved:

Chief,
Nautical Chart Division

Assistant Director,
Office of Cartography

Projects Officer,
Operations Division

Assistant Director,
Office of Oceanography

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-8321

Name on Survey	A On Chart No. 6380	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 BGN	
Bellingham Bay	x									1
Brant Point	x									2
Fishermans Cove	x	recent addition -								3
Gooseberry Point	x									4
Hale Passage	x								x	5
Lummi Bay	x								x	6
Lummi Flats	x									7
Lummi Island	x								x	8
Lummi Indian Reservation	x									9
Lummi Point	x									10
Nooksack River	x									11
Point Migley	x								x	12
Portage Channel	x									13
Portage Bay	x									14
Point Francis ?	x									15
Sandy Point	x									16
The Portage	x									17
										18
			GEOGRAPHIC NAMES SECTION 8 JUNE 1960							19
										20
										21
										22
										23
										24
										25
										26
										27

Form 946

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8321

Records accompanying survey: Smooth sheets 1;

boat sheets 1; sounding vols. 9; wire drag vols. ;

Descriptive Reports 1; graphic recorder envelopes 7;

special reports, etc.

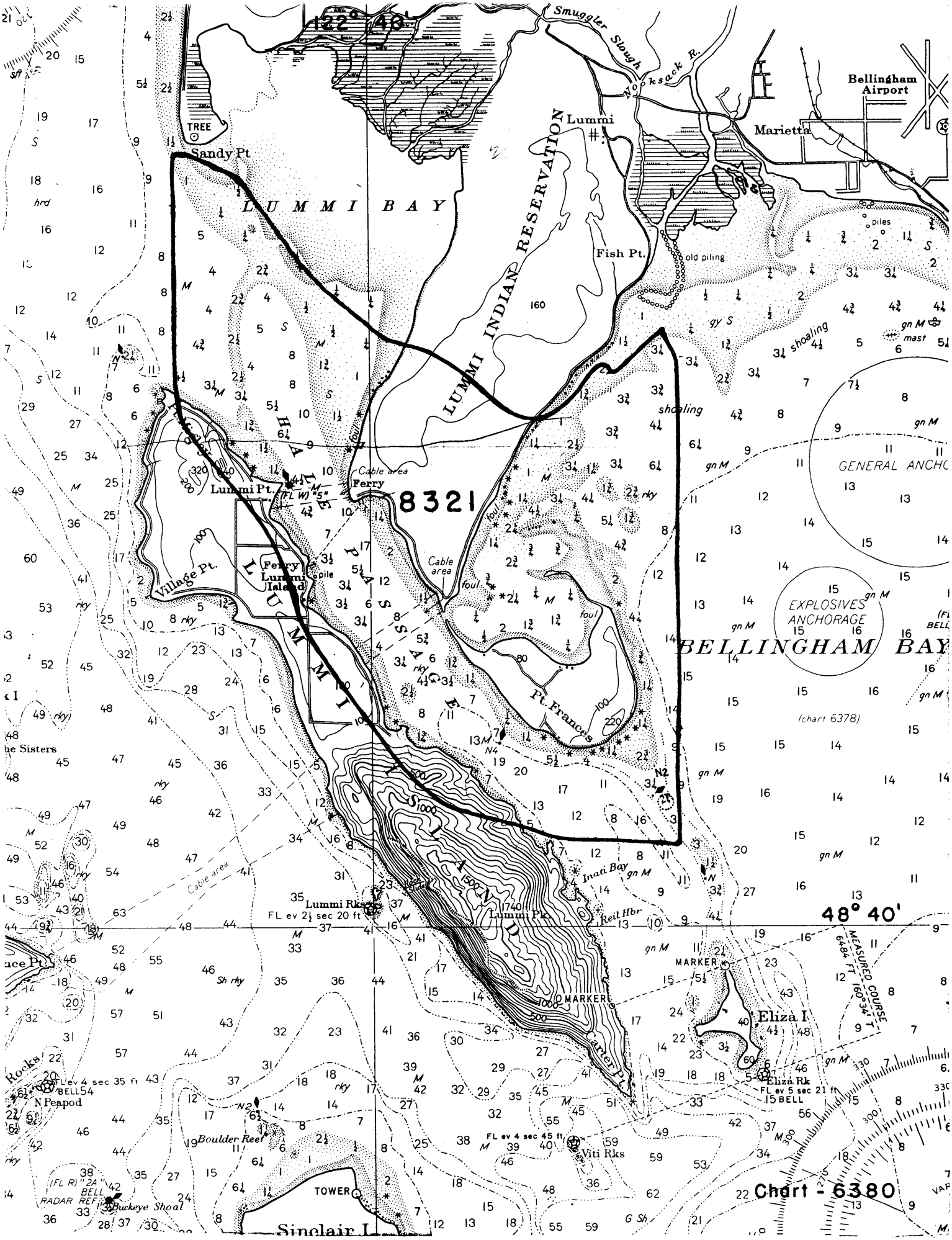
The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet		2466
Number of positions checked		120
Number of positions revised		3
Number of soundings revised (refers to depth only)		470
Number of soundings erroneously spaced		0
Number of signals erroneously plotted or transferred		0
Topographic details	Time	3
Junctions	Time	1 hr.
Verification of soundings from graphic record	Time	36 hrs.
Special adjustments	Time	0

Verification by George A. Merrill / Allan K. Schugelt Total time 45 hrs. / 216 hrs. Date 2-13-62

Reviewed by Fred S. Traver Time 80 hrs Date Jan. 30 1963

US COMM C&GS DC


122° 40'
48° 40'
Smuggler Slough
Nooksack R.
Bellingham Airport
Marietta
Lummi #
LUMMI INDIAN RESERVATION
LUMMI BAY
Sandy Pt
TREE
Fish Pt.
old piling
piles
shoaling
gn M
mast
GENERAL ANCHO
EXPLOSIVES ANCHORAGE
BELLINGHAM BAY
(chart 6378)
Cable area
Ferry
Lummi Pt.
(FL W) "5"
8321
Village Pt.
Ferry Lummi Island
pile
foul
Pt. Frances
Lummi Rks
FL ev 2½ sec 20 ft
Lummi Pk
1740
Reil Hbr
Inati Bay
MARKER
Eliza I
Eliza Rk
FL ev 5 sec 21 ft
BELL
Carter Pt
MEASURED COURSE 6484 FT 160°34' T
N Peapod
FL ev 4 sec 35 ft
BELL 54
Boulder Reef
FL ev 4 sec 45 ft
Viti Rks
TOWER
Buckeye Shoal
(FL R) "2A"
BELL
RADAR REF
Sinclair I
Chart - 6380

NAUTICAL CHARTS BRANCH

SURVEY NO. H-8321

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
5 July 60	6380	Nichols	Before ~~After~~ Verification and Review
12-17-60	6378	M. Rogers	Examined Before ~~After~~ Verification and Review Critical Corr only applied
12-19-60	6380	M Rogers	Re-examined Before ~~After~~ Verification and Review thru chart 6378 drawing (or dtd. 2-8-60).
12-19-60	6300	M Rogers	Examined thru chart 6380 Before ~~After~~ Verification and Review no Corr.
12/6/63	(18424) 6378	C. Misfeldt	~~Before~~ After Verification and Review
7-31-65	(18421) 6380	G. R. Johnson	~~Before~~ After Verification and Review Fully applied thru cht 6378, drg #16.
8-3-65	(18400) 6300	G. R. Johnson	~~Before~~ After Verification and Review Fully applied thru cht 6380, drg #31
2-10-78	18431	D. C. Larson RCS	~~Before~~ After Verification and Review Fully applied New chart
9-9-80	18423A	Ralph B. Ross	~~Before~~ Full After Verification and Review Appld Prev. thru 18424-18421
			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.