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Form 504	
U. S. COAST AND GEODETIC SURVEY	
DEPARTMENT OF COMMERCE	
DESCRIPTIVE REPORT	
Type of Survey	HYDROGRAPHIC
LR-10948	H-7691
Field No. IR-11248	Office No. H-7694
LOCALITY	
State	Washington
General locality	Franklin D. Roosevelt Lake
Locality	Little Dalles to International Boundary
1948	
CHIEF OF PARTY	
J.T. Jarman	
LIBRARY & ARCHIVES	
DATE	1 FEB. 1950

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FEB 1 1950

Form 537
(Ed. June 1946)

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. H-7691

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 7691

Field No. LR 10948

State Washington

General locality Franklin D. Roosevelt Lake
~~Lake Roosevelt~~

Locality Little Dalles to Deep Creek

Scale 1/ 10 000 Date of survey Aug. - Sept. 1948

Instructions dated 20 June 1947 Proj. CS 352

Vessel LCVP

Chief of party J. T. Jarman

Surveyed by J. T. Jarman H. A. Marchant

Soundings taken by fathometer, graphic recorder, ~~hand lead, X-ray~~ Graphic recorder

Fathograms scaled by JCS RC HOL EC FEG RSP

Fathograms checked by HA HCP LEE Jr.

Protracted by Harvey C. Parsons

Soundings penciled by Harvey C. Parsons

Soundings in ~~fathoms~~ feet at ~~MLWOMMXXV~~ a 1290 feet USBR 1937 independent datum, or 1288.575 Feet MSL USC&GS.

REMARKS: The datum plane for the reduction of soundings on this sheet is 1288.575 ft. above MSL. However the water surface at the time of the survey assumed gradient characteristics. This condition complicated the determination of the tide reducers. See folder "Tabulated Tide Reducers" sheets LR 10948 and LR 11248. Also refer to heading "Tides and Currents" descriptive report accompanying sheet.

a) Soundings in feet at lake level datum of 1288.6 ft. above mean sea level (or 1290 ft. USBR, 1937). Elevations are in feet above lake level datum.

FEB 1 1950

Form 537
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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. H-7694

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 7694

Field No. BR 11248

State Washington

General locality Franklin D Roosevelt Lake

Locality Deep Creek to International Boundary

Scale 1/ 10 000 Date of survey Aug.-Sept. 1948

Instructions dated 20 June 1947 Proj. Cs 332

Vessel LCVP

Chief of party J.T.Jarman

Surveyed by Hal A. Marchant, J.T.Jarman

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

Fathograms scaled by Floyd E. Gerken, R.S.Powell, D.M.Whipp

Fathograms checked by Henry Aanenson, Louis E. Ewart Jr.

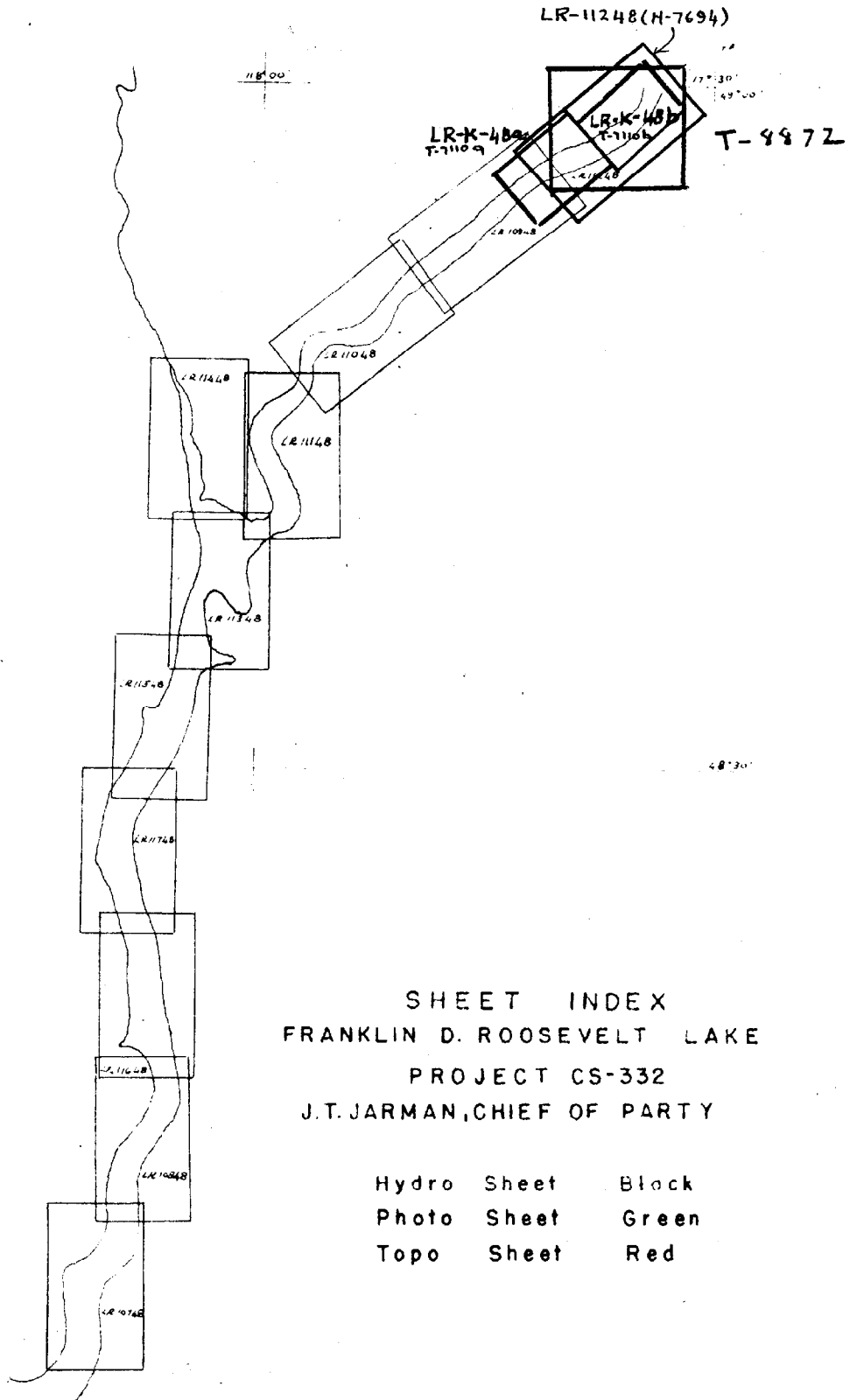
Protracted by Christine N. Hillman

Soundings penciled by Christine N. Hillman

Soundings in ~~fathoms~~ feet at ~~MSL~~ datum, or ~~1393.575 feet~~ MSL 1393.575

REMARKS: The gradient plane for the reduction of soundings on this sheet is a sloping gradient beginning at Deep Creek, elevation 1388.575 ft. MSL, and ending at the International Boundary, elevation 1392.575 ft. MSL, a rise of four feet. This condition complicated the determination of the tide reducers. See folder, "Tabulated Tide Reducers, Sheets LR 10948 and LR 11248; also refer to the heading "Tides and Currents in the descriptive report accompanying the sheet.

Flow at International Boundary corresponding to this gradient is approximately 40,000 cfs.



SHEET INDEX
 FRANKLIN D. ROOSEVELT LAKE
 PROJECT CS-332
 J.T. JARMAN, CHIEF OF PARTY

Hydro Sheet	Black
Photo Sheet	Green
Topo Sheet	Red

118° 30'
48° 00'

118° 00'

118° 30' 48° 30'

Descriptive Report
To Accompany

Hydrographic Survey H-7691, Field No. LR-10948
Hydrographic Survey H-7694, Field No. LR-11248

A. INSTRUCTIONS

1. The hydrographic survey of Franklin D. Roosevelt Lake has been designated Project CS-332. This is in accordance with the original INSTRUCTIONS No. 22/MEK FP-Jarman dated 20 June 1947.

B. SURVEY LIMITS AND DATES

1. Sheet LR-10948^{H-7691 (1948)} extends from a point 1 mile south of the Little Dalles to Deep Creek; work began on the sheet August 18, 1948, and it was completed on October 6, 1948.

2. Sheet LR-11248^{H-7694 (1948)} extends from Deep Creek to the Canadian Border; work began on the sheet September 14, 1948, and ended on October 5, 1948.

3. An investigation in April 1949 on sheet LR-10948 which lasted for approximately 1 hour will be found in volume 8, page 26.

4. An index sheet has been prepared for each hydrographic sheet to show the limits and field numbers of contemporary planimetric shoreline sheets and graphic control sheets; these index sheets are attached to this report.

C. VESSELS AND EQUIPMENT

1. A navy type landing craft, vehicle and personnel, hereinafter referred to as LCVP was used on these surveys. The turning radius of this launch was 25 meters; an outboard fish set at 2 feet below the surface was used; a squat and settlement test gave negligible results.

2. A sub-unit consisting of a hydrographic party and a graphic control party based at Northport, Washington during the period these surveys were in progress. Fathometer batteries were kept charged with a small portable charging unit.

3. Portable depth recorders numbers 86 and 172, NK-7 type were used on these surveys; all soundings were recorded in feet. The NK-7 fathometers were equipped with salt water tachometers calibrated at 4800 feet per second. An 808 type depth recorder equipped with a fresh water tachometer was used a part of one day.

4. A lead line was used in feeling over shoals and in obtaining soundings over submerged rocks.

5. A hand sounding machine and calibrated sheave mounted on the LCVP were used for obtaining temperatures and salinities.

D. TIDES AND CURRENTS

1. Director's letter No. 36-rcb dated May 10, 1949 states that the "1288.6 Foot Plane" is to be used as the reduction plane from Grand Coulee Dam to Deep Creek, and a sloping gradient is to be used as the reduction plane beginning at Deep Creek and increasing to a maximum of 4 feet at the International Boundary. See cahier containing "Copies of Correspondence and Related Information Applicable to Project CS-332, Lake Roosevelt", Part 2. The northern limits of Sheet LR 10948 is at the junction of the "1288.6 foot plane" with the "gradient plane". Therefore, all of sheet LR 10948 will be reduced to the "1288.6 foot plane"; sheet LR 11248 will be reduced to a "gradient plane" which begins at Deep Creek, elevation 1288.6 feet, M. S. L. and increases to 1292.6 feet, M.S.L. at the International Boundary.

Acc. No. 5-2722 (H-7691)
corresponds to flow of approx. 40,000 sec-14.

2. Three tide gages and 1 staff were maintained during the sounding period on sheet LR 10948. Their locations were as follows:

Lower Little Dalles	Lat. 48° 51.95' ³
	Long. 117° 52.6'
Onion Creek Gage and Staff	Lat. 48° 52.42'
	Long. 117° 50.70'
Deadman's Eddy Gage and Staff	Lat. 48° 55.75'
	Long. 117° 45.712'
Deep Creek Gage and Staff	Lat. 48° 56.07'
	Long. 117° 45.12'

Since the water surface during sounding operations assumed gradient characteristics and the reduction plane is 1288.6 feet, the daily reducers will vary according to the relative position of the sounding vessel to the various tide stations. Therefore, the daily water surface curve as indicated by the various gages has been plotted to scale on graph paper which also shows the 1288.6 foot plane; the reducers are indicated on the curve between the change points. These change points were transferred to the boat sheet and the reducers entered in the records according to the time the sounding vessel passed each change point. The practice of plotting the change points on the boat sheet was abandoned when it became evident that too much congestion was resulting; instead, the practice was adopted of plotting the change points for each sounding day on tracing paper overlays to the scale of the boat sheet. These tracing paper curves of the average daily water surface with the change points indicated are being transmitted with the boat sheets. You are referred to the report entitled "Water Surface Elevations, Season 1948" which contains a tabulation of the average daily readings at the various gages and staffs in the fast water area, and descriptions of the gages and staffs.

Filed in Div. of Tides

TIDES AND CURRENTS (continued)

3. A total of 6 tide stations were maintained on sheet LR-11248 ^{H-7694} during the period of sounding operations. The names and locations of these gages and staffs follow:

Deep Creek Gage and Staff	Lat. 48° 56.07'
	Long. 117° 45.1'
Upper Deep Creek Staff	Lat. 48° 56.22'
	Long. 117° 43.91'
Gage 4 Staff	Lat. 48° 57.38'
	Long. 117° 40.9'
Lower Boundary Gage and Staff (USGS)	Lat. 48° 58.3'
	Long. 117° 38.75'
Cable Staff	Lat. 49° 00'
	Long. 117° 37.71

The same conditions exist on this sheet as on LR-10948 except that both the water surface and the reduction plane assume gradient characteristics. However, the procedure for obtaining the reducers is the same as that described in paragraph 2, this same heading.

4. Director's letter No. 22/MEK FP-Jarman dated August 26, 1948, suggests that direct current measurements be obtained with reference to the gaged flow in the fast water area. The hydrographic party attempted to obtain this result by observing the drift of the hydrographic launch between sextant fixes for a specified time interval. The results by sheets follow:

^{H-7691}
Sheet LR 10948

(a) August 29, 1948 (pos. 82k to 83k)
 Locality- Little Dalles
 Time - 2 minutes
 Drift - 267 meters
 Flow - 112,500 sec/ft
 Computed velocity - 4.3 knots.

Note: The LCVP drifted out of the main current and lost approximately 10 seconds of travel time. Estimated current 5.5 knots

(b) October 6, 1948 (pos. 17q to 18 q)
 Locality - Deadman's Eddy
 Time - 6 minutes
 Drift - 203 meters
 Flow - 59,600 sec/ft
 Computed velocity - 1.1 knots

Note: A breeze, force 2 to 3 was blowing upstream and affected this result. Estimates current- 3.0 knots

TIDES AND CURRENTS (continued)

H-7691
Sheet IR 10948 (continued)

(c) October 6, 1948 (pos. 19q to 20q)
 Locality -Northport
 Time -5 minutes
 Drift -149 meters
 Flow -59,600 sec/ft
 Computed velocity -0.96 knots

Note: An upstream breeze, force 4, affected this result. The estimated current for this day and locality is 2.5 knots.

H-7694
Sheet IR-11248

(a) Sept. 17, 1948 (pos 87d, 88d, and 89d)
 Locality -International boundary
 Time -2 minutes
 Drift -383 meters
 Flow -68,700 sec/ft
 Comp. Velocity -6.1 knots

(b) October 4, 1948 (pos. 111f to 112f)
 Locality -Lat. 48 59.49'
 -Long. 117 38.3'
 Time -5 minutes
 Drift -765 meters
 Flow -56,300 sec./ft.
 Comp. velocity -4.9 knots

(c) October 4, 1948 (113f to 114f)
 Locality -Lat. 48 58.0'
 -Long. 117 40.0'
 Time -5 minutes
 Drift -798 meters
 Flow -56,300 sec/ft.
 Comp. velocity -5.1 knots

(d) October 4, 1948 (pos. 118f to 119f)
 Locality - Lat. 48 57.2'
 -Long. 117 42.0'
 Time -5minutes
 Drift -710 meters
 Flow -56,300 sec./ft.
 Comp. velocity -4.6 knots

5. In addition to the foregoing information, your attention is directed to Enclosures C-6, C-7, and C-8 submitted with the Chief of Party's letter entitled "Gradient Study, Fast Water Area, Lake Roosevelt" dated March 21, 1949.

Filed in Div.
of T & C.

Enclosure C-6 is a rating table for the Columbia River at the International Boundary which gives the flow in second-feet to be expected for various water surface elevations.

TIDES AND CURRENTS (continued)

5. (continued) Enclosures C-7 is a rating table for the Cable Gage area giving flow in second-feet to be expected for various water surface elevations.

Enclosures C-8 is a rating table which gives the velocity to be expected for various discharges in second feet.

6. Soundings on the boat sheets are not reduced to the planes discussed in paragraph 2, this heading. The water surface as it existed on August 18, 1948 was adopted as a gradient plane, on sheet LR-10948, (H-7691) and all soundings have been approximately reduced to it. On sheet LR-11248, (H-7694) the water surface as it existed on September 14, 1948 was adopted as a gradient plane, and all soundings have been approximately reduced to it. There is a difference of approximately 2 feet between these planes; the plane on sheet LR-11248 being lower than the plane for sheet LR-10948. (H-7694)

7. The water surface graphs mentioned in paragraph 2, this heading plus the tabulated tide reducers for these two sheets would make this report bulky. Therefore, these items will be included in a separate folder entitled "Tide Reducers, Sheets LR-10948 and LR-11248." (H-7694) Filed in
Div. of T & C.
H-7691

E. SMOOTH SHEETS

1. The smooth sheets have not been plotted. It is expected that remarks under this heading will be inserted in the final descriptive report by the Processing Office. *Smooth Sheets were processed at the Seattle Proc. Off. See notes from that office in this report.*

F. CONTROL STATIONS

1. Horizontal control for this project is second and third order triangulation executed by the USBR from 1934 to 1940. For a complete treatment of the main source of horizontal control refer to "Special Report on Boundary Points, Project Ph-2(45)" previously submitted to the Washington Office. Triangulation was supplemented by topographic stations located by this party and photo-hydro stations furnished by Project Ph-2(45). The latter are discussed in paragraphs 2, 3, and 4, side heading "F", Descriptive Report to accompany hydrographic sheets H-7684, H-7685 and H-7686. (1948-49) (1948) (1948-49) G-7380

2. The majority of the fourth order control points have been located by the planetable. High water during the 1948 flood season destroyed most of the photo-hydro stations submitted by project Ph-2(45). A list of hydrographic stations is attached which gives the source of location.

^{H-7691} 3. Graphic control sheets contemporary to hydrographic sheet LR-10948 are LR-J-48 a&b (~~T-7109-a&b~~) and LR-K-48a (~~T-7110a~~). Shoreline survey sheets, project Ph-2(45) contemporary to this sheet are T-8870, T-8871 and T-8872. of 1946-47

LR-J-48 a&b and LR-K-48a were applied to Hydro. surveys and subsequently destroyed. (The Desc. Rpts for these graphic control surveys are filed with this (H-7691) survey.)

F. CONTROL STATIONS (continued)

H-7694 4. Graphic control sheets contemporary to hydrographic sheet LR-11248 are LR-K-48 a&b (T-7110 a&b). Shoreline survey sheets contemporary to this sheet are T-8871 and T-8872. *of 1946-47.*
Filed with this D.R. (H-769194)

G. SHORELINE AND TOPOGRAPHY

1. The planimetry shoreline was transferred to the boat sheet from ozalid prints furnished by the Washington Office from Project Ph-2(45). Topographic stations were transferred to the boat sheet from applicable graphic control sheets. During the course of the hydrographic survey, some discrepancies were detected and corrected in the shoreline location. The corrected shoreline is shown in red ink on control sheets T-7109 a&b and T-7110 a&b; the discussion of these discrepancies will be found in Descriptive Report accompanying the foregoing control sheets. *Graphic control surveys LR-J-48 and LR-K-48 were destroyed.*
Shoreline revisions made on smooth sheet

H. SOUNDINGS

1. With the exception of one day, soundings on these sheets were obtained with the NK-7 type portable depth recorder equipped with a salt water tachometer. On August 18, 1948 an 808 type depth recorder was used for a partial day on sheet LR 10948, *with fresh water tachometer.*
H-7691

2. The general sounding procedure was as follows: The oscillator depth was maintained at 2 feet. The initial of the fathometer was adjusted to read two feet when the fathometer was operating in feet. This initial adjustment was not changed when the machine was operating in fathoms, and under such conditions, the average initial in fathoms was found to be 1.7 fathoms. The error in fathom initial reading was absorbed in the velocity correction curve. Instructions were given to take three bar checks daily. The fathograms were scanned for variations from the standard initial of 2 feet in feet and 1.7 fathoms in fathoms, and such variations were applied in the record books as an index correction. The bar checks were used to obtain a check on the computed velocity corrections, but the computed velocity corrections were actually used for correcting the soundings.

3. During the winter months between the 1948 and 1949 seasons, a study was made of the bar check data. It was found that a fairly constant residual existed after the velocity corrections had been applied to the bar check soundings. Since the residuals were so nearly constant for the various depths of the bar checks, it was indicated that it was an initial correction. When the above was discovered, the fathograms had already been scanned, and the initial corrections entered as described in paragraph 2 above. Therefore, the average residual for each days bar check was determined and applied algebraically to the scanned initial. See "Cahier of Bar Check Residuals" to be submitted with the 1948 Season's data.

2 Filed with H-7681

H. SOUNDINGS (continued)

4. All soundings were recorded in feet, and the boat sheet is plotted in feet. The Washington Office has specified that the smooth sheet will be plotted in feet.

I. CONTROL OF HYDROGRAPHY

1. The control of the sounding launch was entirely on board the sounding vessel using the standard three point fix method of position fixing. A few exceptions occur where the method outlined in paragraph 3352 of the Hydrographic Manual was used. The latter cases have been covered by notes in the position data column of the sounding records.

2. In executing these hydrographic surveys, many unusual conditions were experienced. Due to the strong currents, current boils, and back eddies, it was necessary to run lines against the current for the best control of the sounding lines. An attempt was made to maintain a uniform rate of speed, but back eddies and variations in current strength prevented it. Therefore, it will be found that like times will not always check the space passed over between positions. Generally, the presence of unusual current conditions have been noted in the records. The absence of compass headings in the records can be explained by the fact that ranges were found to be the best methods of keeping the sounding launch on course. The hydrographic party resorted to one minute intervals between fixes, and on occasion used a 40 second interval.

J. ADEQUACY OF SURVEY

1. It is believed that these two sheets are complete. Boat sheet junctions between these sheets and contemporary sheets appear to be satisfactory. Depth curves can be completely drawn.

K. CROSSLINES

1. Crosslines on these sheets exceed the minimum 8% specified in the instructions. The crosslines check the normal system of development within the limits specified in the Hydrographic Manual.

L. COMPARISON WITH PRIOR SURVEYS

1. Prior surveys of this type do not exist within the area.

M. COMPARISON WITH CHART

1. There is no existing chart of Franklin D. Roosevelt Lake.

N. DANGERS AND SHOALS

1. Dangers and shoals are numerous within the limits of these sheets and extreme caution is necessary to safely navigate the area. The dangers are doubly hazardous due to the swift currents, current boils and eddies, encountered. A list of the dangers by sheets follows:

SHEET LR-10948 (H-7691)

(a) Submerged rock, Lat. $48^{\circ} 51.41'$, Long. $117^{\circ} 53.3'$; least depth $2\frac{1}{2}$ feet; position 121h.

(b) Submerged rock, Lat. $48^{\circ} 51.46'$, Long. $117^{\circ} 53.2\frac{3}{4}'$; least depth $2\frac{1}{2}$ feet, position 123h.

(c) Submerged rock, Lat. $48^{\circ} 51.62'$, Long. $117^{\circ} 52.9'$; least depth $3\frac{1}{2}$ feet, position 153h.

(d) Rock at Lat. $48^{\circ} 51.99'$, Long. $117^{\circ} 52.9'$; bares $2\frac{3}{4}$ feet (signal BIG located on this rock).

(e) Submerged rock, Lat. $48^{\circ} 51.95'$, Long. $117^{\circ} 52.9'$, least depth $2\frac{1}{2}$ feet, position 12n, 123h.

(f) Submerged rock, Lat. $48^{\circ} 52.35'$, Long. $117^{\circ} 51.5\frac{1}{2}'$, least depth $2\frac{1}{2}$ feet, position 32n.

(g) ~~Submerged rock~~, Lat. $48^{\circ} 52.5'$, Long. $117^{\circ} 50.7\frac{1}{2}'$, least depth $1\frac{1}{2}$ foot, position 13f.

(h) ~~Submerged rock~~, Lat. $48^{\circ} 52.2'$, Long. $117^{\circ} 52.46'$, least depth $1\frac{1}{2}$ feet, position 51k.

(i) Submerged gravel bar, Lat. $48^{\circ} 54.2'$, Long. $117^{\circ} 48.73$, least depth $3\frac{1}{2}$ feet, position 1r, 64L. There are several such gravel bars in the same general vicinity with least depths of 5 feet or more. It is believed that they shift location during each spring flood season.

(j) Extensive ~~submerged~~ submerged gravel bar, Lat. $48^{\circ} 54.45'$, Long. $117^{\circ} 48.18'$, least depth $3\frac{1}{2}$ feet, positions 103e to 109e. This bar probably shifts position during flood stages, or periods of strong current.

(k) Small submerged gravel bar, Lat. $48^{\circ} 55.1'$, Long. $117^{\circ} 47.1'$, least depth $3\frac{1}{2}$ feet, position 14q to 16q. Probably shifts position with flood stages.

(l) Small submerged gravel bar, Lat. $48^{\circ} 55.36'$, Long. $117^{\circ} 46.32$, least depth $3\frac{1}{2}$ feet, position 19b. Probably shifts with flood stages.

2 ft
Smooth
Plot

Zero
Smooth
Plot

N. DANGERS AND SHOALS (continued)

SHEET LR-10948(continued) (H-7691)

(m) Submerged rock, Lat. $48^{\circ} 55.88'$, Long. $117^{\circ} 45.60'$, least depth 2 feet, position 83b. This rock is almost in mid-channel in a narrow constricted area where a strong current exists. *reduces to 6 feet rock*

(n) Shifting sand bar, Lat. $48^{\circ} 55.9'$, Long. $117^{\circ} 45.5'$, bares $\frac{3}{4}$ feet, outlined by positions 59b, 60b, and 61b. *6*

SHEET LR-11248 H-7694

(a) Rocky foul area, Lat. $48^{\circ} 56.2'$, Long. $117^{\circ} 45.1'$; both submerged and bare rocks; Channel is to the east of this area.

(b) Submerged gravel bar, Lat. $48^{\circ} 56.35'$, Long. $117^{\circ} 44.25'$; outlined by positions 41a to 45a, 163a, 167a, and 168a. The channel curves around this bar which extends out from the ~~east~~ ^{south} shoreline. A strong current sweeps across the bar; vessels must avoid being set on the bar by the current.

(c) Shoal, Lat. $48^{\circ} 56.2'$, Long. $117^{\circ} 43.73'$; a $\frac{3}{4}$ foot spot which was not thoroughly investigated by the hydrographic party--probably a gravel bar with shifting tendencies. *18*

(d) Submerged gravel bar, Lat. $48^{\circ} 56.3'$, Long. $117^{\circ} 43.5'$; positions 172g and 173g. (Near east shoreline and not particularly dangerous) *11*

(e) Submerged gravel bar, Lat. $48^{\circ} 56.4'$, Long. $117^{\circ} 43.0'$; this bar extends out from the west shoreline at a bend in the river; boats must avoid being set on the bar by the strong current; outlined by positions 20g, 21g, 25g, 29g, 30g, and 36g. *7*

(f) Submerged gravel bar, Lat. $48^{\circ} 58.22'$, Long. $117^{\circ} 39.4'$; extends out from the east shoreline almost to mid-channel; vessels must avoid being trapped on bar by the strong current; probably shifts positions; positions 105d to 110d, 132d, and 134d. *15'*

(g) Submerged gravel bar, Lat. $48^{\circ} 58.4'$, Long. $117^{\circ} 38.9'$; position 72c. Extends out from west shoreline and is not particularly dangerous. *37*

(h) Rocks, Lat. $48^{\circ} 58.4'$, Long. $117^{\circ} 38.55'$; bares approximately $4\frac{1}{2}$ feet; located near middle of river at bend; strong current sweeps both sides of rocks. *7 1/2* *near 76* *88*

(j) Submerged gravel bar, Lat. $48^{\circ} 59.82'$, Long. $117^{\circ} 38.1'$; least depth $1\frac{1}{2}$ foot, positions 39e to 42e. Probably shifts positions. *5*

(k) Rocky foul area, Lat. $49^{\circ} 00'$, Long. $117^{\circ} 37.85'$; outlined by tangents, page 63, Vol. 2, "d" day. This area extends from the west shoreline to near mid-channel; a strong current sweeps around the edge of the area. Some of the rocks in this area were shown on T-8872 (1946-47) by the field units of project Ph-2(45). Apparently the hydrographic *7*

N. DANGERS AND SHOALS (continued)

SHEET IR-11248 (continued) (H-7694)

(k) (continued)

party was at the scene when a lower river level existed since the area is more extensive than was shown on T-8872. Graphic control sheet IR-K-48b outlines this area correctly. ⁽¹⁹⁴⁶⁻⁴⁷⁾ Area shown on hydro sheet ⁽¹⁹⁴⁸⁾

Note: Least depths listed under "Dangers" for IR 10948 and IR11248 are referred to "boat sheet planes". These least depths will change when referred to the planes selected for the smooth plotting of these sheets.

O. COAST PILOT INFORMATION

1. In general, Lake Roosevelt remains at a normal lake level of 1290 feet, USBR 1937 Independent Datum, or 1288.6 feet, M.S.L., from May through October of each year. Under such conditions, the lake's pool characteristics extend to the south end of the LITTLE DALLES with gradients beginning in that vicinity and extending to the Canadian border in a series of steps.

2. The lake is subject to draw-downs during the winter months which will affect the existing gradients. At present, when the in-flow falls below 45,000 second-feet, the draw-down begins. It is gradual and averages about 3 feet per month. To date, the draw-down's have not exceeded a maximum of 15 feet below the normal level. There have been times in the past when the lake level was drawn down 3 to 4 feet during the summer months due to demands by the Bonneville Power Administration for additional water. In 1950-51, when it is estimated that both east and west power houses will be in full operation, the drawdown will begin when the in-flow falls below 75,000 second-feet. It is probable that the lake surface will drop 15 feet per month during this period, and reach its maximum low, or 70 feet below the normal sometime in March. The lake surface will then be 1218.6 feet above mean sea level, and the pool characteristics will extend approximately 5 miles beyond Kettle Falls, Washington. Under such conditions, the surface will assume a gradient north of the latter point.

3. The flood season on the Columbia River usually occurs in May and June of each year. There are generally two peaks during the flood stage, and the maximum flow has been known to reach 600,000 second feet. The narrow constricted area known as the Little Dalles acts as a dam during flood stages, and causes the river level to rise north of that point. The surface of the main reservoir never exceeds the normal level of 1288.6 feet, M.S.L. The fast water area during flood stages has numerous whirlpools, eddies, and current boils. The current is accelerated and sometimes reaches a peak of 15 miles per hour in narrow constricted areas such as the Little Dalles.

O. COAST PILOT INFORMATION(continued)

4. In general, from January to March, the lake is iced over from the Canadian border to the mouth of the Spokane River, and no navigation is possible during this period. During severe winters, the icing starts in December, and the entire lake freezes over from the border to the dam.

5. During extreme high water it is not feasible to navigate north of the Little Dalles. In general, the fast water area may be navigated in March and April of each year, and from July through December of each year. The length of the navigable periods vary according to local weather conditions. They are also affected by the flow in second feet and at what elevation the lake level is being held. The latter factors can be ascertained from officials of the USBR at Coulee Dam, Washington. It is the opinion of this party that in general, no attempt should be made to navigate the fast water when the flow exceeds 200,000 second-feet. The foregoing paragraphs 1 through 5 discuss, in general, the surface conditions in the fast water area, and the various flow conditions which affect safe navigation. In order to formulate adequate coast pilot information an examination should be made of the enclosures submitted under the heading "Gradient Study, Fast Water Area" dated March 21, 1949. *Filed with H-7694*

6. There follow some notes listed by sheets which were submitted by the hydrographer who was in charge of hydrography in the fast water area.

SHEET LR-10948 *H-7691*

Lake surface pool characteristics end at the south end of the Little Dalles. A gradient begins at the latter point and extends by a series of steps to the Canadian border. Current in the fast water area depends on the flow of the river and the elevation of the surface of Lake Roosevelt.

In proceeding upstream from the lower reaches of this sheet, the first hazard encountered is an area known as the Little Dalles which is a narrow gorge with rock walls of varying heights. When the flow in this gorge exceeds 175,000 second-feet, navigation becomes hazardous due to the strong current, current boils, whirlpools, and eddies.

To avoid the more turbulent areas, the hydrographic party always entered the Little Dalles on the south side and steered a course adjacent to the south bank. At Lat. $48^{\circ} 52.25'$; Long. $117^{\circ} 52.3'$, there is a small cove which has good holding ground, offers protection from current, and can be used as an emergency anchorage. Continue to favor the south side of the channel to Lat. $48^{\circ} 52.6'$; Long. $117^{\circ} 51.0'$; the vessel now leaves the Little Dalles and enters a wide portion of the river where mid-channel courses may be steered to Lat. $48^{\circ} 54.2'$; Long. $117^{\circ} 48.45'$; the course should then be zero degrees true for 0.4 mile.

*Reduces to bare rock
at lake level*

O. COAST PILOT INFORMATION (continued)

This leg follows the old river bed between two areas where gravel bars exist, an extensive bar on the right at Lat. $48^{\circ} 54.45'$, Long. $117^{\circ} 48.7'$ with a least depth of $\frac{3}{2}$ feet and several small bars on the left at Lat. $48^{\circ} 54.29'$, Long. $117^{\circ} 48.7'$ with a least depth of $\frac{3}{2}$ feet. As the north or west shore is approached on this leg, change course and favor this side of the river to the vicinity of Deadman's Eddy at Lat. $48^{\circ} 55.9'$, Long. $117^{\circ} 48.5'$. This area is considered more dangerous than the Little Dalles; there is a submerged rock pinnacle in the middle of the eddy at Lat. $48^{\circ} 55.88'$, Long. $117^{\circ} 45.6'$ with a least depth of $\frac{1}{2}$ feet; on the left or west shore there is a visible rocky foul area; the channel passes midway between these two dangers. The submerged rock will be indicated by current boils and water piling up. At the time hydrography was executed in this area there was a foot drop in the water surface in less than $\frac{1}{2}$ mile; the current was estimated at 6 knots. It is dangerous to follow the east shore in this area because of currents subject to rapid changes which have a tendency to set a craft on the rocky beach. There is also a sandbar which undoubtedly shifts position.

There are no really excellent anchorages on this sheet. The following are recommended as offering some protection against the current, and good holding ground:

Lat. $48^{\circ} 51.85'$ --- Good protection from the current in depths of 40' to 60 feet. Mud and sand bottom.

Lat. $48^{\circ} 52.25'$ --- Emergency anchorage in the Little Dalles in ¹⁹~~20~~ foot depths with mud and sand bottom.

Lat. $48^{\circ} 52.55'$ --- Good holding ground in ¹⁹~~25~~ to 30 foot depths, some current and eddies; there are rocks off the mouth of Onion Creek to the south.

Lat. $48^{\circ} 53.4'$ --- Fair protection from current in 10 foot water with good holding ground. *4 & 5 ft shoals are found in this area.*

Lat. $48^{\circ} 54.05'$ --- An excellent small boat anchorage in creek, depths of ¹⁶~~20~~ feet with good holding ground.

Lat. $48^{\circ} 54.25'$ --- Fair anchorage in 15 feet of water with sand and gravel bottom.

Lat. $48^{\circ} 56.2'$ --- Good anchorage in ⁸~~15~~ foot depths with mud bottom; current weak with a few eddies.

The U. S. Customs and Immigration Service maintain an office in the city of Northport, Washington; the Canadian government maintains a like office at Waneta, British Columbia which is just across the International Boundary. Northport, Washington is the port of entry for all craft entering the United States via the Columbia River.

See Pg 14, P 4 for proper location of name.

0. COAST PILOT INFORMATION(continued)

When landing at the city of Northport, it is recommended that landings be made at Lat. $48^{\circ} 54.94'$, Long. $117^{\circ} 47.4'$ which is a small bight that provides shelter from the main river current. There is a sand bottom with a minimum depth of $8\frac{1}{2}$ feet. Local boatmen use this area for an anchorage. There are no docks at Northport other than the ferry landing.

SHEET LR-11248 H-7694

Surface characteristics in this area are more like those of a river although backwater exists from the lake proper. In proceeding upstream from the lower reaches of the sheet, maintain a course adjacent to the south or east bank until Steamboat Rock is passed, then swing over to the west, or north shore to avoid an extensive submerged gravel bar; when Lat. $48^{\circ} 56.545'$, Long. $117^{\circ} 44.25'$ is reached take a mid-channel course, and observe precautions to prevent the vessel being swept on the gravel bar to the right by the current. When nearing the south or east shore, alter the course to proceed upstream about 75 to 100 yards of the beach. When Lat. $48^{\circ} 56.8'$, Long. $117^{\circ} 42.75'$ is reached, take mid-channel courses to Lat. $48^{\circ} 58.2'$, Long. $117^{\circ} 39.4'$; at this point the ~~left~~ ^{west} shore should be favored to avoid a submerged gravel bar on the ~~right~~ ^{east}; continue along the ~~left~~ ^{west} shore until the next bend is rounded and the vessel is well past the concrete USGS Gaging Station Tower (on the east half of the channel just up-stream from the USGS Gaging Tower there are some exposed rocks surrounded by dangerous current eddies); after passing the latter danger the course should be changed to favor the east bank, proceeding up-stream about 75 to 100 yards off the beach to the International Border.

There are very few possible anchorages within the limits of this sheet. Those that offer the best possibilities are listed below:

Lat. $48^{\circ} 56.45'$ Long. $117^{\circ} 43.8'$	Good anchorage; protection from current in cove; Bottom-sand; Depths $15\frac{1}{2}$ feet.
Lat. $48^{\circ} 58.2'$ Long. $117^{\circ} 39.3'$	Some protection from current behind gravel bar; bottom- sand and gravel; depth, 15 to 20 feet.
Lat. $48^{\circ} 59.2\frac{1}{2}'$ Long. $117^{\circ} 38.15'$	Some protection from current south of rocky foul area; bottom, sand and rock; depths 15 to 20 feet.

7. For additional discussion of Coast Pilot Information, refer to "Coast Pilot Information, Project Ph-2(45)" previously submitted to the Washington Office.

8. Attempts to navigate the fast water area should not be attempted with low powered boats. The craft should be highly maneuverable with cruising speed of 10 knots or better. It is desirable to have a large factor of safety with regard to reserve speed and power.

P. AIDS TO NAVIGATION

1. There are no fixed or floating aids to navigation within the limits of these surveys. There is a dolphin, or cluster of piling on sheet IR-10948 which is recommended for charting. The object has a diameter of approximately 4 feet and extends 15 feet above normal low water surface. The location of the object follows:

DOLPHIN	Lat. 48° 53' /	(917.8) /	935.7 meters
		(419.2) /	
	Long. 117° 49' /	803.2 /	"

Q. LANDMARKS FOR CHARTS

1. Landmarks for charts have been reported on form 567, project Ph-2(45). A copy of this form is attached to this report and one additional object is recommended as follows:

Tower, steel supporting USGS overhead stream gaging cable.

Lat. 48° 59' /	(1763.5)	H-7694	90.0 meters
	(867.0)		
Long. 117° 38' /	353.0		"

R. GEOGRAPHIC NAMES

1. For a complete treatment of Geographic Names refer to "Special Report, Geographic Names, Sheets 8860 to 8872, Project Ph-2(45)" previously submitted to the Washington Office. This report lists the name DEADMANS EDDY at Lat. 48° 55.8', Long. 117° 45.6' on T-8871. According to the following sources, this name should appear at Lat. 48° 56.2', Long. 117° 43.5' on sheet T-8872.

L. L. Parker Storekeeper and boat operator. Residence: 5 years
Northport, Washington Age: 50 years

Ray Evans Occupation: Miner. Residence: 20 years. Age: 60
Northport, Washington years.

Mr. Evans states that the island shown at Lat. 48° 56.3', Long. 117° 45.3', sheet T-8871 is known locally as DAN MCNEILL ISLAND.

S. SILTED AREAS

1. No silted areas were noted by an inspection of the fathograms.

T. BY-PRODUCT INFORMATION

1. In addition to providing a basic hydrographic survey of Lake Roosevelt, the party has attempted to obtain sufficient information by hydrographic methods from which the Bureau of Reclamation can delineate 10 foot bottom contours. Therefore, the survey is somewhat more detailed than would ordinarily be the case.

Leave name at original position, according to names reported.

489179

489179

U. MISCELLANEOUS.

1. The gravel bars and shoals mentioned under DANGERS give little or no indication of their presence. The water is disturbed and aerated which makes it difficult to spot dangers beneath the surface.

2. It is generally agreed by residents of Northport, Washington that sand bars, and gravel bars shift position during flood stages.

V. REFERENCES

1. The following listed reports will be of help and interest in connection with this survey:

Descriptive Report to Accompany Hydrographic Survey Nos. H-7684, H-7685, and H-7686. *of 1948.*

Coast Pilot Report, Franklin D. Roosevelt Lake, Project Ph2(45). *Filed in C.P. Sect.*
Special Report, Investigation of Geographic Names, Sheets T-8860 through T-6672, Project Ph-2(45). *Filed in Geo. Name Sect.*

Special Report on Reservoir Boundary Control Points. Project Ph-2(45). *S-7380*
Descriptive Report, Planimetric Air Photographic Shoreline, T-8870 to T-8872.

Season's Report, Project CS-332, Franklin D. Roosevelt Lake, 1947. *J.T. Jarman*

Season's Report, Project CS-332, Franklin D. Roosevelt Lake, 1948.

Season's Report, Project CS-332, Franklin D. Roosevelt Lake, 1949.

Water Surface Elevation (Tides), Season 1948, Project CS-332. *Filed in Div. of*

Water Surface Elevation (Tides), Season 1949, Project CS-332. *Tides & Currents*

Cahier "Copies of Correspondence and Related Information Applicable to Project CS-332, Lake Roosevelt". *Acc. No. S-2722*

Cahier "Barcheck Residual Study".

Report of Preliminary Investigation of Lake Roosevelt by John C. Ellerbe.

Correspondence relative to determination of s.d.g. datum in East Waters Area. Filed with H-7694 (1948-49)

X. TABULATION OF APPLICABLE DATA

1. The following data is being submitted for sheet LR-10948: *(H-7691)*

Sounding Volumes (Form 275)	8 Vol.
Fathograms	7 rolls.
Boat Sheet (LR-10948)	1 ea.
Control Sheet (LR-J-48 a&b)	1 ea.
Velocity Correction Computations (16 Aug. to 22 Nov. 1948)	1 cahier.
Descriptive Report (hydrography)	
Descriptive Report (Topography)	

2. The following data is being submitted for sheet LR-11248: *(H-7694)*

Sounding Volumes (Form 275)	4 Vol.
Fathograms	3 rolls.
Boat Sheet (LR-11248)	1 ea.
Control Sheet (LR-K-48 a&b)	1 ea.
Velocity Correction Computations (16 Aug. to 22 Nov. 1948)	1 cahier
Descriptive Report (Hydrography)	
Descriptive Report (Topography)	

X. TABULATION OF APPLICABLE DATA (continued)

3. The following data which will be submitted is applicable to all sheets covered by this Report:

Velocity Correction Computations 8/16/48 to 11/22/48	Acc. 5-2722	1	cahier
Velocity Corrections, 1949 Season		1	cahier
Water Surface Elevations (Tides), 1948 Season	Div. of Tides	1	"
Water Surface Elevations (Tides), 1949 Season		1	"
Cahier of Bar Check Residuals		1	cahier
Tabulated Tide Reducers, 1948 Season		1	"
Cahier of Correspondence and Related Information	Acc. No. 5-2722	1	"
Tide Data and Marigrams for all Gages	Div. of Tides		
Level Records for all Tide Stations			
Recoveries and Notes, Triangulation			
Bench Mark Descriptions and Recoveries			

4. The following work has been accomplished on the records of these sheets:

All fathograms have been scaled and checked.
 Velocity corrections have been entered and checked.
 Tide Reducers have been entered and checked.
 Fathogram Index corrections have been entered and checked.

5. There remains to be accomplished the following work on the records and data of these sheets:

Reduce and check soundings. *Accomplished by Seattle Proc. Office.*
 Plot smooth sheet.

REMARKS

1. This report is prepared from notes submitted by Hal A. Marchant who was in charge of the hydrographic launch in the fast water area. The chief of Party was with Mr. Marchant about three weeks of the seven weeks the party was engaged on the project. One week's time was lost to the project on account of a motor breakdown. There was some indication that the breakdown might be due to sabotage, but an analysis of the crankcase motor oil by the Federal Bureau of Investigation did not show any abrasives present.

Respectfully submitted,


 J. T. Jarman
 Chief of Party

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

POST-OFFICE ADDRESS: Box 337, Coulee Dam, Wash.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

August 26, 1949

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

Subject: Approval of data and records.

Data and records belonging to hydrographic sheets H-7691 and H-7694 have been inspected and are approved.

In the Descriptive Report, side heading "R", paragraph 1, it is noted that the geographic name, DEADMANS EDDY is misplaced as shown on T-8871. However, all references in the report to the name, Deadmans Eddy, with regard to tide gage location, Coast Pilot Notes, and rock locations refer to the locality of the name as shown on T-8871.

See Pg. 11
PR of
the D.R.


J. I. Jarman
Chief of Party

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

POST-OFFICE ADDRESS: Box 337, Coulee Dam, Wash.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

Oct. 10, 1949

Mr. E.E. Smith
U.S. Coast and Geodetic Survey
Seattle, Wash.

Dear Mr. Smith:

The office has granted me 30 days of leave enroute which means that I will not report for duty until about the middle of November. However, I will be in Seattle with my family by November 5th. and I will be available for consultation, if you need me.

In writing descriptive reports, I noted that sheets IR-11048, IR-11148, and IR-11348 have notes stating that heavy grass was found on several shoals which gave a much shallower fathometer sounding than was obtained with a lead line. Sheet IR-11148 is one of the sheets which I smooth plotted. While I was going over it, I noted that my men, in scanning the fathograms, had read the shallowest indications in the locations where the ~~grass~~ grass existed. The leadline sounding over these grass covered areas was always 3 to 4 feet deeper than the fathometer soundings. A close examination of the fathograms leads me to believe that by carefully rescanning them that the approximate correct depths can be obtained from the fathograms. If such areas on the fathograms are not rescanned, then the smooth sheet will show depths considerably shallower than actually exist. The only two sheets you need be concerned with will be ~~IR-11148~~ IR-11048 and IR-11348. I will take care of IR-11148 when I arrive.

112694
On sheet IR-10248, the park Service have discovered a rock filled crib in mid-channel which was missed by the hydrographic party. It is in the big bend about 1 mile north of DEADMAN'S EDDY as shown on the shoreline survey sheet. I will attempt to locate this obstruction before I depart from here. The sailing directions contained in my descriptive report for IR-11248 will have to be rewritten as result of this discovery.

Plotted on smooth sheet from data furnished by J.T.J.

Best Regards,

J.T. Jarmen
J.T. Jarmen

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

TO BE CHARTED } STRIKE OUT ONE
~~TO BE DELETED~~ Coulee Dam, Wash. Aug. 26, 1945

I recommend that the following objects which have ~~(been charted)~~ been inspected from seaward to determine their value as landmarks be charted on ~~(the chart)~~ the charts indicated.
The positions given have been checked after listing by J. W. Deal

J. W. Deal
Chief of Party

CHARTING NAME	DESCRIPTION	SIGNAL NAME	POSITION			DATUM	METHOD OF LOCATION AND SURVEY NO.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
			LATITUDE	LONGITUDE	D. P. METERS							
STATE Washington Franklin D. Roosevelt Lake												
TOWER T-8871, T-7110a	H-7691 Square, 182 ft. high.	Tal	48 55	117 46	(1556.8)	NA	Radial Plot	1947				Not Charted
STACK T-8871, T-7110a	H-7691 Cylindrical, 93 ft. high.	Rod	48 55	117 46	(1361.5)	"	"	"				"
TOWER T-8871	H-7694 Concrete, USGS Gaging Station	Sow	48 58	117 38	(1348.8)	"	"	"				"
TOWER T-8871	H-7694 Concrete, USGS Gaging Station	---	49 00	117 37	(1782.5)	"	"	"				"
The above were submitted by field units, Project Ph-2(45); they are satisfactory. In addition the following is recommended.												
TOWER Steel, USGS Gaging Station		Cab	48 59	117 38	(1763.5)	"	"	"				"

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 charts.

Data applicable to sheet H-7691 (LR-10948)

Sheet LR-10948

BAR CHECK RESIDUALS

(To be applied to scanned Index Corrections algebraically)

7-186
(July 1935)

Date	Bar Check Residuals		Fath.	Remarks
	Feet	Fms.		
Aug.			NK-7	
19	-0.8	0.0	172	LCVP
20	-1.5	0.0	172	"
23	-1.1	0.0	172	"
24	-0.8	0.0	172	"
25	-0.6	0.0	172	"
26	-0.7	0.0	172	"
27	-1.4	0.0	172	"
28	-0.7	0.0	86	"
29	-0.8	0.0	86	"
31	-1.1	0.0	86	"
Sept.				
1	-0.5	0.0	86	"
2	-1.3	0.0	86	"
3	-1.4	0.0	86	"
13	-1.4	0.0	86	"
Oct.				
6	-0.5	0.0	86	"

Statistics

H-7691, Field No. LR-10948 (H-7691)
1948 Season

Date	Day Letter	Positions	Statute Miles	H.L. Snd.
Aug. 18	a	125	11.8	0
19	b	128	8.3	7
20	c	99	5.8	6
23	d	218	24.2	1
24	e	125	10.0	1
25	f	162	15.4	2
26	g	18	5.4	0
27	h	208	18.8	3
28	j	65	5.1	0
29	k	130	7.3	15
31	l	155	9.5	1
Sept. 1	m	155	9.6	2
3	n	86	6.3	6
13	p	76	7.2	0
Oct. 6	q	100	7.2	5

1949 Season

Apr. 25	r	2	0.0	2
---------	---	---	-----	---

Totals 1852 148.7 51

Area Sq. statute miles--- 2.5

H 7691
LR 10948

Lake Roosevelt, Washington.

Processing Office Notes.

Smooth Sheet.

The projection and grid were ruled on the machine in Washington where shoreline was traced and signals pricked on the sheet. Signals have been checked in Seattle against film positive copy of T 8871 and against the graphic control sheet made in the field. ⁽¹⁹⁴⁶⁻⁴⁷⁾

Smooth plotting at Seattle has progressed under the attention of the Chief of Party. He has inspected the sheet.

Plotting.

In areas of very close development an overlay was made showing all soundings in fine print and the depth curves were drawn. These curves were transferred to the smooth sheet and then a selection of soundings was made along the sounding lines.

In the vicinity of Lat 48 54.2 Long. 117 48.7 three systems of development were made. Two of these systems were plotted on the smooth sheet and the third is plotted on an overlay tracing.

In order to show the canyon bottoms and shelves considerable re-scanning was done. Considerable attention was paid to double returns or side echoes. Where the shelf surface was already shown on the adjacent sounding line the deepest sounding was recorded to retain the record of the canyon bottom. The semi-diameter of the cone of signal dispersion at canyon bottom depth was determined to obtain the maximum horizontal distance to the objects causing the side echo. So sharp breaks in the bottom slopes were plotted. The crossings of the depth curves were scaled on the fathogram and transferred to an overlay. This enabled the plotter to find true bottom on many confused sections of the fathograms; as, when there were side echoes from both canyon walls.

in Little Dalles area numerous sdgs revised accepting shoaler sdgs from side echoes

A study was made of the fathograms to determine if the canyons were continuous or were a series of pot holes. A trace of the canyon was found through the areas of greatest confusion.

Fathometer speed.

The fathogram speed has been checked at random intervals throughout each profile with templates prepared for the calibration of the fathometer in use.

Other subjects have been covered by the report of the field party.

Edgar E. Smith
Edgar E. Smith
Cart. Engr.
Seattle proc. Off. 1/18/50

H 7691 *214* ✓
LR 10948

Lake Roosevelt, Washington.

Geographic names penciled
on smooth sheet.

*Franklin D. Roosevelt Lake

Stevens County

Northport

Sand Point

Smelter Rock

Little Dalles

* This strip of water retains the swift current and characteristics of the Columbia River, and it probably should be so called. The normal pool level created by the dam, 1290 feet USBR datum, ends just below the Little Dalles. There is a gradient in the river surface from this point northward. For the reduction of soundings the waters of this sheet were reduced to normal pool level (1290 feet USBR) as a datum altho in fact the water rises above it running up stream, and the current is dangerous in places, with whirlpools, swirls and boils.

Sheet LR-11248

Bar Check Residuals

7-186
(July 1935)

(To be applied algebraically to scanned Index Corrections)

Date	Bar Check Residuals Feet	Fms.	Path.	Launch	Remarks
Sept			NK-7		
14	-0.6	0.0	86	LCVP	
15	-0.7	0.0	86	LCVP	
16	-0.6	0.0	86	LCVP	
17	-0.5	0.0	86	LCVP	
20	-0.9	0.0	86	LCVP	
Oct.					
4	-0.3	0.0	86	LCVP	
5	-0.5	0.0	86	LCVP	

Data applicable to sheet H-7694 (LR-11248)

Statistics
H-7694, Field No. LR-11248

Date	Day Letter	Positions	Statute Miles	H.L. Snd.
Sept. 14	a	223	15.5	4
15	b	185	15.2	1
16	c	224	20.1	4
17	d	89	5.6	4
20	e	132	9.3	4
Oct. 4	f	119	9.7	11
6	g	175	10.1	10
Totals 1147			85.5	38

Area sq. statute miles-- 1.5

7694

H 7694
LR 11248

Lake Roosevelt, Washington.

Geographic names penciled on smooth sheet.

* Franklin D. Roosevelt Lake

Canada

Stevens County

Dan McNeil Island

** Deadmans Eddy

Seriver Creek

Deep Creek

Steamboat Rock

Sand Point

* This part of the water is above the pool level and retains a swift current and the characteristics of the Columbia River. While the Coulee Dam authorities have control to the Canadian line it seems that this strip of water should be more correctly called Columbia River.

**Deadmans Eddy is shown a mile further down river, just below Sand Point, on T 8871. See statement of C O P page 14 Descriptive Report H 7694. Leave it at original position
LH

7694

H 7694
LR 11248

Lake Roosevelt, Washington.

Processing Office Notes.

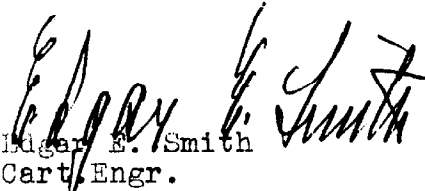
Smooth sheet.

The projection and grid were ruled on the machine at Washington. Topographic signals were checked against film positive copies of the photo-topo compilation and against the graphic control sheet made in the field.

Fathograms.

These were checked for fathometer speed several times on each days work. We have at hand templates for fresh and salt water calibrations of both the 808 and NK 7 fathometers. Fathograms were checked with the appropriate templates.

Other subjects have been covered by the report of the field party.


Edgar E. Smith
Cart. Engr.
Seattle Proc. Off.

1/16/50

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

Division of Charts:

Plane of reference approved in
volumes of sounding records for

HYDROGRAPHIC SHEET H-7694 (LR-11248)

Locality Washington
Franklin D. Roosevelt Lake
Deep Creek to International Boundary

Chief of Party: J.T. Jarman 1292.575 ft. at International Boundary
Plane of reference is a sloping gradient; 1288.575 ft. at Deep Creek Gage
1294.048 ft. on tide staff at International Boundary Gage
56.570 ft. below B. M. 1356 (USGS)

-1.723 ft. on staff No. 1 at Deep Creek Gage
42.218 ft. on staff No. 2 at Deep Creek Gage
61.547 ft. below B.M. 808 T WWPC

There are 4 intervening gages and staffs between the stations listed above as follows: Cable Gage staff; Lower Boundary Gage; Gage 4 staff; and Upper Deep Creek staff. The hydrographic party determined the characteristics of the latter gages and staffs by a graphic curve.

Refer to the Descriptive Report, side heading "D", paragraphs 1 through 4 for further information on surface conditions as they existed on this sheet.

Condition of records satisfactory except as noted below:

Chief, Division of Tides and Currents.

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

Division of Charts:

Plane of reference approved in
volumes of sounding records for

HYDROGRAPHIC SHEET H-7691 (LR-10948)

Locality Washington
Franklin D. Roosevelt Lake
Marble, Wn. to Deep Creek

Chief of Party: J.T. Jarman

Plane of reference is 1288.575 feet above mean sea level.
1289.646 ft. on tide staff at Lower Little Dalles
74.818 ft. below B. M. CP-265

1.555 ft. on tide staff at Onion Creek Gage
22.728 ft. below B.M. G-10

-0.568 ft. on tide staff No. 1 at Deadman's Eddy
2.408 ft. " " " No. 2 " " "
55.828 ft. below B.M. WC Sec.4 (GLO)

-1.723 ft. on tide staff No. 1 at Deep Creek Gage
2.218 ft. " " " No. 2 " " "
61.547 ft. below B.M. 808 (T WWPC)

Condition of records satisfactory except as noted below:

Note:

The plane of reference for this sheet is 1288.575 feet, M.S.L. However, the water surface assumed gradient characteristics when the hydrography was accomplished. Therefore, it is necessary to draw curves of the water surface for each day on which hydrography was accomplished as explained in the Descriptive Report, side heading "D", paragraph 1 through 4.

Chief, Division of Tides and Currents.

FEB 15 1950

FORM 537a 19-24-47		DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY		REGISTER NO. T - 7109a <i>Destroyed</i>
TOPOGRAPHIC TITLE SHEET			FIELD NO. LR-J-48a	
Each Planetable and Graphic Control Sheet should be accompanied by this form, completed so far as practicable, when forwarded to the Washington Office.				
STATE <u>Washington</u>				
GENERAL LOCALITY <u>Franklin D. Roosevelt Lake</u>				
LOCALITY <u>Shelter Rock to Lat. 48° 57.3'; Long. 117° 41.2'</u>				
SCALE <u>1: 10,000</u>		DATE OF SURVEY <u>August</u> , 19 <u>48</u>		
VESSEL <u>Project CS-332</u>				
CHIEF OF PARTY <u>J.T. Jarman</u>				
SURVEYED BY <u>Phillip Rabideau</u>				
INKED BY <u>Hal A. Marchant</u>				
HEIGHTS IN FEET ABOVE MHW OR <u>see below</u> <input type="checkbox"/> TO GROUND <input type="checkbox"/> TO TOPS OF TREES				
CONTOUR APPROXIMATE CONTOUR FORM LINE INTERVAL _____ FEET				
PROJECT NUMBER <u>CS-332</u>				
REMARKS <p>The datum plane is 1288.575 feet above mean sea level from Grand Coulee Dam to Deep Creek; a sloping gradient from Deep Creek to the International Boundary. The sloping gradient is 1288.575 feet above mean sea level at Deep Creek and rises to 1292.575 feet at the international Boundary, a rise of 4 feet. Regarding heights of rocks and islands as shown on the sheet, refer to paragraph 5 under the heading, "Methods" in the descriptive report.</p> <p><i>Hydrographic signals shown on LR-J-48a+b were applied to H-7691 & H-7692, after which LR-J-48 a+b was destroyed.</i></p> <p><i>The magnetic declination at Δ CP-267 (USBR) 1936-47, Aug. 12, 1948, at 12:00, was 22° 05' E.</i></p>				

FEB 15 1950

FORM 537a
(9-27-47)

DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO. T ~~71096~~
Destroyed

TOPOGRAPHIC TITLE SHEET

FIELD NO. LR-J-48b

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

Franklin D. Roosevelt Lake

LOCALITY

Lat. 48° 57.3'; Long. 117° 41.2' to International Boundary

SCALE

1: 10,000

DATE OF SURVEY

August, 1948

VESSEL

Project CS-332

CHIEF OF PARTY

J.T. Jarman

SURVEYED BY

Phillip Rabideau

INKED BY

Hal A. Marchant

HEIGHTS IN FEET ABOVE MHW OR see below

TO GROUND

TO TOPS OF TREES

CONTOUR

APPROXIMATE CONTOUR

FORM LINE INTERVAL _____ FEET

PROJECT NUMBER

CS-332

REMARKS

The datum plane is 1288.575 feet above mean sea level from Grand Coulee Dam to Deep Creek; a sloping gradient from Deep Creek to the International Boundary. The sloping gradient is 1288.575 feet above mean sea level at Deep Creek and rises to 1292.575 feet at the international Boundary, a rise of 4 feet. Regarding heights of rocks and islands as shown on the sheet, refer to paragraph 3 under the heading, "Methods" in the descriptive report.

Hydrographic signals shown on LR-J-48⁹⁷b were applied to H-7691 & H-7692, after which LR-J-48⁹⁷a+b was destroyed.

The magnetic declination at ACP 216 (USBR) 1936, April 25, 1949 at 1400, was 22° 05' E.

FORM 537a
19-24-47

DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO. T-~~7110a~~
Destroyed

TOPOGRAPHIC TITLE SHEET

FIELD NO. LR-K-48a

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

Franklin D. Roosevelt Lake

LOCALITY

Onion Creek to Smelter Rock

SCALE

1: 10,000

DATE OF SURVEY

August, 1948

VESSEL

Project CS-332

CHIEF OF PARTY

J.T. Jarman

SURVEYED BY

Phillip Rabideau

INKED BY

Hal A. Marchant

HEIGHTS IN FEET ABOVE

~~MEAN~~ 1288.575 Ft.
M.S.L.

TO GROUND

TO TOPS OF TREES

CONTOUR

APPROXIMATE CONTOUR

FORM LINE INTERVAL _____ FEET

PROJECT NUMBER

CS-332

REMARKS

Datum Plane is 1288.575 feet above mean sea level from Grand Coulee Dam to Deep Creek; a sloping gradient from Deep Creek to the International Border. This sheet falls within the "1288.575 foot plane" area. However, it should be noted that the water surface at the time of the survey was a gradient. Elevations of islands and rocks as shown on the sheet are referred to a specific day, and the date is given opposite the elevation shown. See paragraph 3 under the heading, "Methods", descriptive report.

and changes in shoreline
Hydrographic signals shown on LR-K-48a were applied to H-7691 & H-7694, after which LR-K-48a was destroyed.

The magnetic declination at AWWP AP 808 (USBR), 1936-47, on Aug. 20, 1948, at 13:00 was 22°10' E.

FEB 15 1950

FORM 537a (9-2-47)		DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY		REGISTER NO. F-7110b <i>Destroyed</i>
TOPOGRAPHIC TITLE SHEET				FIELD NO. LR-K-48b
Each Planetable and Graphic Control Sheet should be accompanied by this form, completed so far as practicable, when forwarded to the Washington Office.				
STATE <u>Washington</u>				
GENERAL LOCALITY <u>Franklin D. Roosevelt Lake</u>				
LOCALITY <u>Marble Washington to Onion Creek</u>				
SCALE <u>1: 10,000</u>		DATE OF SURVEY <u>August</u> , 19 <u>48</u>		
VESSEL <u>Project CS-332</u>				
CHIEF OF PARTY <u>J.T. Jarman</u>				
SURVEYED BY <u>Phillip Rabideau</u>				
INKED BY <u>Hal A. Marchant</u>				
HEIGHTS IN FEET ABOVE MEAN <u>1288.575</u> ft. <input type="checkbox"/> TO GROUND <input type="checkbox"/> TO TOPS OF TREES <u>M.S.L.</u>				
CONTOUR APPROXIMATE CONTOUR FORM LINE INTERVAL _____ FEET				
PROJECT NUMBER <u>CS-332</u>				
REMARKS Datum plane is 1288.575 feet above mean sea level from Grand Coulee Dam to Deep Creek; a sloping gradient from Deep Creek to the International Boundary. This sheet is in the 1288.575 foot plane area. <i>Hydrographic signals and shoreline changes shown on Graphic Control Survey LR-K-48b were applied to H-7694, after which LR-K-48b was destroyed.</i> <i>The magnetic declination at Δ CP-283 (USBR) 1936 on May 10, 1949, at 14:45, was 22°10' E.</i> <i>The magnetic declination at Δ CP-285 (USBR) 1936 on May 10, 1949, at 14:20, was 22°10' E.</i>				

FEB 15 1950

FORM 537a 19-74-471		DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY		REGISTER NO. T 7116 <i>Destroyed</i>	
TOPOGRAPHIC TITLE SHEET				FIELD NO. LR-L-48a ✓	
Each Planetable and Graphic Control Sheet should be accompanied by this form, completed so far as practicable, when forwarded to the Washington Office.					
STATE <u>Washington</u>					
GENERAL LOCALITY <u>Franklin D. Roosevelt Lake</u>					
LOCALITY <u>Bossburg, Wash to Fifteen Mile Creek</u>					
SCALE <u>1: 10,000</u>			DATE OF SURVEY <u>August</u> , 19 <u>48</u>		
VESSEL <u>Project CS-332</u>					
CHIEF OF PARTY <u>J.T. Jarman</u>					
SURVEYED BY <u>Phillip Rabideau</u>					
INKED BY <u>Hal A. Marchant</u>					
HEIGHTS IN FEET ABOVE MEAN SEA <u>1288.575 Ft.</u> <input type="checkbox"/> TO GROUND <input type="checkbox"/> TO TOPS OF TREES <u>M.S.L.</u>					
CONTOUR APPROXIMATE CONTOUR FORM LINE INTERVAL _____ FEET					
PROJECT NUMBER <u>CS-332</u>					
REMARKS <p>Datum plane is 1288.575 feet above mean sea level from Grand Coulee Dam to Deep Creek; a sloping gradient from Deep Creek to the International Border.</p> <p>This sheet is in the "1288.575 foot plane" area.</p> <p><i>shows on LR-L-48a+b</i> <i>Hydrographic signals were applied to surveys H-7692 & H-7693, after which LR-L-48a+b were destroyed.</i></p> <p><i>The magnetic declination at Δ CP-255, 193647, (USBR) on Sept. 1, 1948 at 10:00 was 22°04' E.</i></p>					

FEB 15 1950

FORM 537a 19-24-47		DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY		REGISTER NO. T-7111b
TOPOGRAPHIC TITLE SHEET			FIELD NO. LR-L-48b	
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 Franklin D. Roosevelt Lake				
LOCALITY Fifteen Mile Creek to Marble, Wash.				
SCALE 1: 10,000		DATE OF SURVEY August, 1948		
VESSEL Project CS-332				
CHIEF OF PARTY J.T. Jarman				
SURVEYED BY Phillip Rabideau				
INKED BY Hal A. Marchant				
HEIGHTS IN FEET ABOVE MEAN SEA LEVEL 1288.575 ft. <input type="checkbox"/> TO GROUND <input type="checkbox"/> TO TOPS OF TREES M.S.L.				
CONTOUR APPROXIMATE CONTOUR FORM LINE INTERVAL _____ FEET				
PROJECT NUMBER CS-332				
REMARKS Datum Plane is 1288.575 feet above mean sea level from Grand Coulee Dam to Deep Creek; a sloping gradient from deep creek to the International Border. This sheet is in the "1288.575 foot Plane" area. <i>Hydrographic signals and shoreline changes shown in red on LR-L-48b (T-7111b) were transferred to H-7692 after which LR-L-48b was destroyed.</i> <i>The magnetic declination at CP-200 (USBR), 1936, on 9-18-48 at 0405, was 22°00' E (Jca/red).</i>				

Descriptive Report

To Accompany

Topographic Control Survey T-7111 a&b, Field No. LR-L-48 a&b } *Destroyed*
Topographic Control Survey T-7110 a&b, Field No. LR-K-48 a&b }
Topographic Control Survey T-7109 a&b, Field No. LR-J-48 a&b }

These surveys are a by-product of Projects Ph-2(45), and CS-332. Project Ph-2(45) furnished shoreline and photo-hydro locations for the hydrographic survey of Franklin D. Roosevelt Lake. Project CS-332 is a hydrographic survey of the lake. The control sheets were used to locate additional hydrographic stations by planetable methods, as well as to verify, in several instances, the compilation of the shoreline, and the location of some of the photo-hydro stations.

INSTRUCTIONS

1. These surveys are not covered by specific instructions. In general, instructions for Project CS-332 cover the surveys. The latter instructions suggest that additional hydrographic stations be located by sextant cuts plotted on the boat sheets. Due to the large number of additional stations necessary, the suggestion was not practical, and separate control sheets were adopted.

SURVEY LIMITS AND DATES

1. These surveys extend from Bossburg, Washington to the International Boundary. They were executed during the months of August and September, 1948.

LR-L-48 extends from Bossburg, Washington to Fifteen Mile Creek; work began on the sheet on August 15, 1948 and it was completed on August 19, 1948. It supplements T-8868 and T-8869. *of 1946-47.*

LR-L-48a extends from Fifteen Mile Creek to Marble, Washington; began work on August 10, 1948 and the sheet was completed on August 15, 1948. It supplements T-8869 to T-8870. *of 1946-47*

LR-K-48b extends from Marble, Washington to Onion Creek; began work on August 3, 1948 and the sheet was completed on August 10, 1948. It supplements T-8870 and T-8871. *of 1946-47*

LR-K-48a extends from Onion Creek to Smelter Rock; began work on this sheet August 5, 1948 and the sheet was completed on August 10, 1948. It supplements T-8871. *of 1946-47*

LR-J-48a extends from Smelter Rock to Lat. $48^{\circ} 57.3'$, Long. $117^{\circ} 41.2'$; began work on this sheet August 10, 1948 and the sheet was completed on August 16, 1948. It supplements T-8871 and T-8872. *of 1946-47*

LR-J-48b extends from Lat. $48^{\circ} 57.3'$, Long. $117^{\circ} 41.2'$ to the International Boundary; work began on August 20, 1948 and the sheet was completed on August 26, 1948. It supplements T-8872. *of 1946-47*

CONTROL

1. Horizontal control for these surveys is second and third order triangulation executed by the Bureau of Reclamation from 1934 to 1940. For a complete treatment of the main source of the horizontal control, refer to the "Special Report on Reservoir Boundary Points, Project Ph-2(45)" previously submitted to the Washington Office. Refer also to the Descriptive Report accompanying Hydrographic Sheets LR-10147 (H-7681) and LR-10247 (H-7682), side heading "F".

2. The USBR third order control within this area is listed in plane coordinates based on the Washington North State Grid System. Descriptive Report to accompany T-7108 a&b under the heading "Control" contained a discussion which intimated that the USBR third order points were not exactly relative. Such a discussion does not apply to the area covered by this report since the topographic party experienced no difficulty with the control.

METHODS

1. Standard planetable methods were used throughout the survey. In a few instances, the planetable method of signal location was supplemented by theodolite cuts which were protracted.

2. On sheets LR-L-48 a&b and LR-K-48b, the elevations of rocks and islands as shown on the sheets are referred to the "1290 foot datum plane" which is based on the 1937 USBR Independent Datum of Leveling. The "1290 Foot Plane" is the normal lake level, and the maximum height to which the water rises in the lake. The plane is the equivalent to 1288.575 feet above mean sea level. For additional treatment of this subject, refer to Descriptive Report to accompany Hydrographic Sheets LR-10147 and LR-10247, side heading "D".

3. On sheets LR-K-48a and LR-J-48 a&b, the elevations of rocks and islands are referred to the surface elevation for a specific day. Therefore, the date is listed opposite the noted "elevations above the surface" on these sheets. The Director has specified that the "1290 Foot Plane", (1288.6 feet, M.S.L.) will extend to Deep Creek, and that a sloping gradient will extend from the latter point to the International Boundary. This sloping gradient rises from elevation 1288.6 feet, M.S.L. at Deep Creek to 1292.6 feet at the International Boundary. Therefore, the elevations of rocks and islands shown on the sheets under discussion in this paragraph will have to be corrected to the planes specified by the Director for the smooth plotting of the hydrographic sheets. For additional treatment of this subject refer to Descriptive Report to accompany hydrographic Sheets LR-10948 and LR-11248, side heading "D". You are also referred to the cahier entitled "Copies of Correspondence and Related Information Applicable to Project CS-332", part 2.

4. Recovery notes are being submitted for all triangulation stations visited during the course of these surveys. In some instances, USBR Second Order triangulation stations were used for orientation purposes, but the stations were not visited. The original tripod placed at the station when the triangulation was executed, was still standing and was used for the sighting point.

T. 7109 a+b = #7691
 7110 a+b = #7691-96
 7111 a } = #7693 + 7692
 7111 b }

METHODS(continued)

5. Locations of photo-hydro stations which were accepted from shoreline survey sheets T-8868 through T-8872 have been shown on the control sheets with green circles. The majority of such points from the Little Dalles to the International Boundary were destroyed by the Spring flood of 1948. Locations of additional stations plus the locations of photo-hydro stations found to be in error have been shown with red circles.

6. These control sheets contain the final accepted locations for all hydrographic control, and where discrepancies exist, if any, the control sheet location should be accepted.

SHORELINE AND TOPOGRAPHY

1. The shoreline shown in pencil on these sheets came from shoreline survey sheets T-8868 through T-8872. The following checks, or shoreline changes were ascertained by planetable methods:

(a) T-7111b, change in shoreline of minor nature between signals FOG to DEB; Lat. $48^{\circ} 48.3'$, Long. $118^{\circ} 00.45'$ to Lat. $48^{\circ} 49.9'$, Long. $117^{\circ} 59.4'$. This change appears to have been caused by slides; corrected on control sheet in red ink. #7692

(b) T-7111a, shoreline change of minor nature between signals HOW to MID, Lat. $48^{\circ} 49.2'$, Long. $117^{\circ} 55.3'$ to Lat. $48^{\circ} 50.5'$, Long. $117^{\circ} 55.2'$. This change appears to have been caused by slides; corrected on the control sheet in red ink. #7692

(c) T-7109b, minor change in shoreline between signals SIS to OIL, Lat. $48^{\circ} 50.8'$, Long. $117^{\circ} 54.9'$ to Lat. $48^{\circ} 51.1'$, Long. $117^{\circ} 54.3'$. This change apparently caused by slides; corrected on control sheet with red ink. #7692

(d) T-7109b, change in shoreline between signals FOE to CAN, Lat. $48^{\circ} 51.3'$, Long. $117^{\circ} 53.7'$ to Lat. $48^{\circ} 51.75'$, Long. $117^{\circ} 52.7'$. This change is believed to be a compilers error; corrected in red ink. #7691

(e) T-7109b, change in Onion Creek bight, Lat. $48^{\circ} 52.45'$, Long. $117^{\circ} 50.7'$. This change is believed to be a compilers error; corrected in red ink. #7691

(f) T-7109a, minor change in shoreline, vicinity of signal NED, Lat. $48^{\circ} 52.95'$, Long. $117^{\circ} 50.1'$. This is a rocky point and is a compilers error probably caused by shadows on the photographs. Corrected in red ink. #7691

(g) T-7109a, change in shoreline of a gravel bar which was shown as an island on sheet T-8870, Lat. $48^{\circ} 55.25'$, Long. $117^{\circ} 46.7'$. This change was caused by the spring flood of 1948. The shoreline is shown in red ink as it existed during the course of this survey, but it is probably subject to future changes. #7691

(h) T-7110a, change in shoreline of Smelter Rock, Lat. $48^{\circ} 55.45'$, Long. $117^{\circ} 46.2'$. This change is believed to be a compilers error. Corrected in red ink on the control sheet. #7691

SHORELINE AND TOPOGRAPHY (continued)

(i) T-7110a, slight change noted in Lat. $48^{\circ} 55.8'$, Long. $117^{\circ} 45.4'$. H-7691
Corrected in red ink and believed to be a compilers error.

(j) T-7110a, change in shoreline between signals MOP to Sky, Lat. $48^{\circ} 56.25'$, Long. $117^{\circ} 45.9'$. This change was caused by the spring flood of 1948; shown correctly on the control sheet in red ink. H-7691

(k) T-7110a, change in tip of sand point at Lat. $48^{\circ} 56.4'$, Long. $117^{\circ} 43.9'$. This change is caused by the water surface being at a lower elevation than it was when the aerial photographs were obtained. The shoreline shown on T-8871 and T-8872 is based on the elevation of the water surface which existed when the photographs were obtained. It was believed in the fall of 1947 when field inspection of the photographs, Project Ph-2(45), was in progress that this surface approximated a mean low water gradient which was the plane expected to be used for the hydrographic surveys. Actually, planes somewhat lower than a mean low water gradient were adopted. It is not believed that the latter planes will materially affect the shoreline as shown on T-8871 and T-8872 except in relatively flat areas. The point under discussion is one such area; one other is discussed in the paragraph immediately following. The only other features to be affected by the adopted datums will be the rocks and gravel bars listed under side heading "N" (Dangers and Shoals), descriptive report to accompany hydrographic sheets LR-10948 and LR-11248. H-7694

(l) T-7110a, Change in shoreline at Lat. $48^{\circ} 56.75'$, Long. $117^{\circ} 43.1'$ is shown in red ink on the control sheet. This change is caused by the water surface being at a lower elevation than it was when the photographs were obtained. It is approximately the shoreline which can be expected from the adopted sounding datum. H-7694

(m) T-7110b, change in shoreline between signals SCW and JUG, Lat. $48^{\circ} 58.4'$, Long. $117^{\circ} 38.6'$; believed to be a compilers error; shown on the control sheet in red ink. H-7694

(n) T-7110b, Lat $49^{\circ} 00'$, Long. $117^{\circ} 37.85'$ --T-8872 does not show the rocks outlined in red ink on the control sheet. They may have been covered by high water when the photographs were obtained or they may have been obscured by a cloud. The rocks are shown as they existed on September 17, 1948. It is a combination intersection and sketching location; the outside limits are well defined; some of the interior rocks are sketched. H-7694

COAST PILOT INFORMATION

1. For a complete discussion of Coast Pilot Information refer to "Coast Pilot Information, Franklin D. Roosevelt Lake, Project Ph-2(45)" which has already been submitted to the Washington Office. Also refer to Descriptive Report to accompany hydrographic sheets LR-10948 and LR-11248, and Descriptive Report to accompany hydrographic sheet LR-11048. H-7692

Filed in
Coast Pilot
sect.

AIDS TO NAVIGATION

1. There are no fixed or floating aids to navigation within the limits of these sheets. A fixed aid to navigation is being recommended on attached form 567 as follows:

Dolphin	Lat. 48° 53'	(917.8) 935.7 meters	H-7691
	Long. 117° 49'	(419.2) 803.2 "	

This object has an approximate diameter of 4 feet and extends 15 feet above normal low water, a cluster of piling.

LANDMARKS FOR CHARTS

1. Landmarks for charts have been reported on form 567, project Ph-2(45). A copy of this form is attached to this report, and two additional objects are recommended as follows:

TOWER, steel supporting USGS stream gaging cable	Lat. 48° 59'	(1763.5) 90.0 meters	H-7694
	Long. 117° 38'	(867.0) 353.0 meters	
LOOKOUT HOUSE, Swede Pass	Lat. 48° 47'	(20.9) 1832.5 Meters	H-7692
	Long. 117° 56'	(895.2) 329.2' "	

Project Ph-2(45) lists the latter object as an Aeronautical Aid, but it was noticed during the hydrographic survey that Swede Pass Lookout house is also visible over a long stretch of the lake.

GEOGRAPHIC NAMES

1. For a complete treatment of Geographic Names refer to "Special Report, Geographic Names, Sheets 8860 to 8872, Project Ph-2(45)" previously submitted to the Washington office. The foregoing report lists the name "Deadmans Eddy" at Lat. 48 55.8', Long. 117 45.6' on T-8871. According to the following sources, this name should appear at Lat. 48 56.2', Long. 117 43.5' on sheet T-8872. It is shown in pencil correctly on control sheet IR-J-48a.

See note by Geo. Name Sect P.R. in D.R. (49.14)

L.L. Parker Storekeeper and boat operator. Residence: 5 years; Northport, Washington age: 50 years.

Ray Evans Occupation: Miner. Residence: 20 years. Northport, Washington age: 60 years.

Mr. Evans states that the island shown at Lat. 48 56.3, Long. 117 45.3', sheet T-8871 is known locally as DAN MCNEIL ISLAND.

The extensive shoal at China Bend, sheet T-8870, Lat. 48 49.3', Long. 117 56.0', could well be named CHINA BAR.

REFERENCES

1. The following listed reports will be of help and interest in connection with this survey:

- Descriptive Report to Accompany Hydrographic Survey Nos. LR-10948 and LR-11248. *H-7694*
- Descriptive Report to Accompany Hydrographic Survey No. LR-11048. *(H-7692)*
- Coast Pilot Report, Franklin D. Roosevelt Lake, Project Ph-2(45).
- Special Report, Investigation of Geographic Names, Sheets T-8860 to T-8872, Project Ph-2(45).
- Special Report on Reservoir Boundary Control Points, Project Ph-2(45).
- Descriptive Report, Planimetric Air Photographic Shoreline, T-8870 to T-8872.
- Water Surface Elevations (Tides), Season 1948, Project CS-332.
- Water Surface Elevations, Tides, Season 1949, Project CS-332.
- Cahier "Copies of Correspondence and Related Information Applicable to Project CS-332, Part 2.

H-7691

See Pg. 15 P.V. of Desc. Rpt.

REMARKS

1. Under the heading, SHORELINE AND TOPOGRAPHY, paragraph 1k, this report, there is a brief discussion relative to the difference in datums used on Project Ph-2(45) and CS-332. The photographs of the area covered by this report were obtained on August 27, 1946. It has been ascertained from the USBR that the inflow at the Dam was 97,000 second-feet on that date. With such a flow at the Dam, the flow at the International Border would be approximately 93,000 second-feet.

2. Your attention is directed to Enclosures C-6 and C-7 which were submitted with the Chief of Party's letter entitled "Gradient Study, Fast Water Area, Lake Roosevelt" dated March 21, 1949. Enclosure C-6 is a rating table for the Columbia River at the International Boundary which gives the flow in second-feet for various water surface elevations, Enclosure C-7 is a rating table for the cable gage area giving flow in second-feet to be expected for various water surface elevations. Knowing the flow in second-feet in the fast water area for the date, August 27, 1946, it may be possible to determine roughly the elevation of the water surface for that date by referring to the foregoing enclosures.

Filed in Div. of Tides.

3. As has already been stated, it is believed that the difference in the two datums will not materially affect the shoreline as shown on sheets T-8870, T-8871, and T-8872. However, the information offered above does provide a method of roughly checking on any discrepancies which may arise.

4. This report is compiled from rough notes submitted by the topographic party.

Respectfully submitted,

J. F. Jarman
J. F. Jarman,
Chief of Party

GEOGRAPHIC NAMES
 Survey No. H-7691

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
<u>Washington</u>								US&B.	1
<u>Stevens County</u>									2
<u>Franklin D. Roosevelt Lake</u>								US&B	3
<u>Little Dalles</u>									4
<u>Onion Creek</u>				(location at tide staff)					5
<u>Northport</u>									6
<u>Smelter Rock</u>									7
<u>Sand Point</u>									8
<u>Sheep Creek</u>									9
<u>Deadmans Eddy</u>				(location of tide staff)					10
<i>See pg 14 of the above report for correct location.</i>									11
<i>Names underlined in red are approved</i>									12
<i>2-9-50</i>									13
<i>L. HECK</i>									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27

GEOGRAPHIC NAMES
Survey No. H-7694

Name on Survey											
	A	B	C	D	E	F	G	H	K		
<u>Washington</u>										US&B	1
<u>Stevens County</u>											2
<u>Canada</u>											3
<u>Franklin D. Roosevelt Lake</u>										US&B	4
											5
											6
<u>Sand Point</u>											7
<u>Deep Creek</u>											8
<u>Dan McNeil Island</u>											9
<u>Steamboat Rock</u>											10
<u>Seriver Creek</u>											11
											12
											13
											14
											15
											16
											17
											18
											19
											20
											21
											22
											23
											24
											25
											26
											27

Names underlined in red are approved.
2-9-50
L. H. Clark

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-7691.....

Records accompanying survey:

Boat sheets ¹....; sounding vols.⁸; wire drag vols.;
bomb vols.; graphic recorder rolls ⁴envel.
special reports, etc.
.....

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

Number of positions on sheet		1852	
Number of positions checked		101	
Number of positions revised		1	
Number of soundings revised (refers to depth only)		33	
Number of soundings erroneously spaced		0	
Number of signals erroneously plotted or transferred		0	
Topographic details	Time	8	
Junctions	Time	2	
Verification of soundings from graphic record	Time	44	
Verification by <i>Robert C. Richard</i>	Total time	195	Date 5/18/50
Reviewed by <i>Wm. Zerk</i>	Time	31	Date 6-23-50

Hydrographic Surveys (Chart Division)

H-7694

HYDROGRAPHIC SURVEY NO.

Records accompanying survey:

Boat sheets ¹.....; sounding vols. ⁴.....; wire drag vols.;
 bomb vols.; graphic recorder rolls ².....; enyel.
 special reports, etc.

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

Number of positions on sheet		.147
Number of positions checked		.37
Number of positions revised		.1
Number of soundings revised (refers to depth only)		.7
Number of soundings erroneously spaced		.0
Number of signals erroneously plotted or transferred		.0
Topographic details	Time	.8
Junctions	Time	.3
Verification of soundings from graphic record	Time	.30

Verification by *Robert C. Richard*..... Total time 128... Date 5/23/50.

Reviewed by *Em Zeskind*..... Time .20... Date 6/29/50

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DEPARTMENT OF COMMERCE

U. S. Coast and Geodetic Survey

1500 Westlake Ave., North
Seattle, Wash.

March 9, 1950

To: Chief, Division of Coastal Surveys
U. S. Coast and Geodetic Survey
Washington, D. C.

Via: The Director
U. S. Coast and Geodetic Survey
Washington, D. C.

Subject: Comments, Project CS-332, Lake Roosevelt

In view of the fact that the Lake Roosevelt Hydrographic sheets are about plotted and will soon be ready for verification, the following comments are considered appropriate. Some of the remarks that follow have been included in the descriptive report, but it is believed that this letter should be made a part of all the descriptive reports for a better understanding of the problems confronting the party.

CONTROL

1. The control which was already in place was executed by the Bureau of Reclamation from 1934 to 1942. The second order scheme placed on the higher elevations on either side of the lake is apparently good triangulation. It is listed in both geographic coordinates and plane coordinates.
2. The USBR third order control was listed in plane coordinates only. A local plane coordinate system with triangulation station ALPHA as origin was used from Grand Coulee Dam to the mouth of the Spokane river. On the Spokane river and north of its mouth, the Washington North State Grid coordinates were used. The third order control consists of intersection stations, three point fixes observed on second-order stations with a fourth object observed as a check, and three point fixes with a azimuth check observed from one of the stations in the fix. The third order points used by the party were called CPs by the USBR, and furnished most of the control for graphic signal location. In the opinion of the Chief of Party, the latter control was not absolutely relative.

Comments, Project CS-332, Lake Roosevelt
J. T. Jarman, Chief of Party

When using an aluminum backed topographic sheet, the plotted positions of all visible CPs could not always be checked exactly with the alidade from a planetable setup with the board oriented on another CP. However, the error was generally very small and we were able to obtain intersection of cuts by keeping the orientation in the general direction of the cuts. In some areas, the error was not noticeable, and in others, it could be detected. The USBR stated that some of the difficulty might be due to slides and shifting of earth masses adjacent to the lake which is possible. It was also determined that it was common USBR practice to observe a three point fix from a "near point" which was tied to the monument by a distance and direction. The "near point" was not marked except by stake and the distance was sometimes as much as 200 yards. Apparently, the term, "near point", means an eccentric observation for the three point fix. It is just possible that the eccentric distance and direction in such cases was carelessly measured. It is also my understanding that the CP stations in certain areas were not marked until well after the observations had been completed which may have produced errors in station location. The foregoing facts are enumerated as a possible explanation for the discrepancies noted; in the opinion of the Chief of Party the third order triangulation is adequate as it now exists for the control of hydrography on the lake.

3. The map manuscripts produced by Project Ph-2(45) used both second order stations and third order CPs as control. The results obtained on shoreline location and photo-hydro station location were excellent. In general, the graphic control party made a practice of checking the locations of the photo-hydro stations as furnished by Project Ph-2(45). Approximately 75% of those checked were exact in location; about 20% of those checked were located within the limits of the photogrammetric specifications which stated that no point on the map manuscript was to be out of position more than 0.5 millimeter. This would be a maximum error of 5 meters on a scale of 1:10,000, and some of the stations approaching the maximum error were relocated by the graphic control party and shown with red circles on the control sheets. The remaining 5% of the photo-hydro stations checked by the graphic control party were relocated and shown with red circles on the control sheets.

PERSONNEL

1. With the exception of the commissioned officers, the personnel employed during the project were inexperienced. A number of Filipino Cadets were assigned to the party for training. These men all had an engineering background and some of them were familiar with C&GS methods. They were a decided assistance in the completion of the project, but with the exception of Messers. Ventura and Abrogar, they should

Comments, Project CS-332, Lake Roosevelt
J. T. Jarman, Chief of Party

not have been placed in charge of a hydrographic launch without an experienced officer being aboard. However, exigencies encountered caused some of these Cadets to be placed in charge of a hydrographic launch for limited periods. We also had a bright young man on the party by the name of Charles Lind who was rated an hydrographer observer by Lt. Comdr. Moore. Late in the 1948 Season, sickness among key personnel caused Lt. Comdr. Moore to place Mr. Lind in charge of a hydrographic launch before he had acquired a full rounded experience.

2. Sheets LR-10648 and LR-11148 were plotted at Coulee Dam, Washington by Filipino Cadets. These men were relatively inexperienced and several errors were detected and corrected when the sheets were inspected. It is believed that the sheets are now acceptable, but it is suggested that the verifier give them a close scrutiny.

3. The foregoing facts are mentioned for the benefit of the verifier; it is believed that any discrepancies which resulted have been eliminated during the smooth plot.

SEASON OF 1949

1. During the 1948 Season, the project area was covered by hydrography, but there were a number of unfinished details when weather terminated the season sooner than expected. These details including a few poorly located signals, a number of undeveloped areas, and a failure to feel over some shoals with the leadline were undertaken during the short 1949 season. Sheets between the Little Dalles and Gifford, Washington received detailed attention; other 1948 sheets received minor attention.

2. Several draftsman in the Seattle Processing Office have pointed out that leadline soundings obtained in 1949 are sometimes slightly deeper than the corresponding fathometer sounding. The LCVP was the launch used for feeling operations in 1949. The fathometer fish was located amidships, and it was necessary to obtain leadline soundings from the bow of the launch, a distance of approximately 15 feet from the fathometer fish. The general procedure was to use the fathometer to find the shoal, and after the launch was approximately over it, both fathometer and leadline soundings were obtained. Because the shoals were generally of limited extent with a very irregular bottom and both time and money were short in 1949, no attempt was made to verify fathometer soundings which were no more than 1 foot shoaler than the corresponding leadline sounding, the policy being to show the shoaler of the two soundings obtained.

Respectfully submitted,

/s/ J. T. Jarman
Chief of Party

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-7691

FIELD NO. LR-10948

Washington, Franklin D. Roosevelt Lake, Little Dalles to
Deep Creek

Surveyed in Aug. - Sept. 1948

Scale 1:10,000

Project No. CS-332

Soundings:

Control:

808 Fathometer
NK-7 Fathometer

Sextant fixes on shore signals

Chief of Party - J. T. Jarman
Surveyed by - J. T. Jarman and H. A. Marchant
Protracted by - H. C. Parsons
Soundings plotted by - H. C. Parsons
Verified and inked by - R. C. Richard
Reviewed by - I. M. Zeskind, 23 June 1950
Inspected by - R. H. Carstens

1. Shoreline and Control

The shoreline of this survey originates with air-photographic surveys T-8870 and T-8871 of 1946-47. Shoreline revisions in red are from graphic control surveys LR-K-48a and LR-J-48a & b (field numbers) which were subsequently destroyed.

The control is adequately described in the Descriptive Report.

2. Sounding Line Crossings

Depths at crossings are in adequate agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated.

This is a survey of a portion of the Franklin D. Roosevelt Lake formed by the impoundment of the Columbia River upstream from the Grand Coulee Dam. The bottom is very irregular and in general slopes sharply from shore to depths of 28 to 134 ft. A number of shoals, bars and channel deeps contribute to the bottom irregularity.

4. Junctions with Contemporary Surveys

Adequate junctions were effected with H-7692 (1948-49) on the southwest and H-7694 (1948) on the northeast.

5. Comparison with Prior Surveys

No prior surveys of the area have been made by this Bureau.

6. Comparison with Charts

There are no charts of the area by this Bureau.

7. Condition of Survey

a. The sounding records and Descriptive Report are complete and comprehensive.

b. The field plotting was accurately done.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

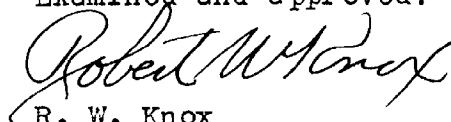
9. Additional Field Work Recommended

This is an excellent basic survey and no additional field work is recommended.

Examined and approved:



H. R. Edmonston
Chief, Nautical Chart Branch



R. W. Knox
Chief, Division of Charts



L. S. Hubbard
Chief, Section of Hydrography



W. M. Scaife
Chief, Division of Coastal Surveys

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-7694

FIELD NO. LR-11248

Washington, Franklin D. Roosevelt Lake, Deep Creek to the
International Boundary
Surveyed in Aug. - Sept. 1948 Scale 1:10,000
Project No. CS-332

Soundings:

808 Fathometer
NK-7 Fathometer

Control:

Sextant fixes on shore
signals

Chief of Party - J. T. Jarman
Surveyed by - J. T. Jarman and H. A. Marchant
Protracted by - C. N. Hillman
Soundings plotted by - C. N. Hillman
Verified and inked by - R. C. Richard
Reviewed by - I. M. Zeskind, 29 June 1950
Inspected by - R. H. Carstens

1. Shoreline and Control

The shoreline of this survey originates with air-photographic surveys T-8871 and T-8872 of 1946-47. Shoreline revisions in red are from graphic control surveys LR-K-48a & b (field numbers) which was subsequently destroyed.

The control is adequately described in the Descriptive Report.

2. Sounding Line Crossings

Depths at crossings are in adequate agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated.

This is a survey of a portion of the Franklin D. Roosevelt Lake formed by the impoundment of the Columbia River upstream from the Grand Coulee Dam. The bottom is very irregular and in general slopes sharply from shore to depths of 14 to 45 ft. A number of shoals, bars and channel deeps contribute to the bottom irregularity.

Two shoal areas covered by depths of less than 6 ft. extend as much as 230 meters offshore in the western portion of the survey.

4. Junctions with Contemporary Surveys

An adequate junction was effected with H-7691 (1948) on the west. On the northeast the present survey extends to the limit of the project.

5. Comparison with Prior Surveys

No prior surveys of the area have been made by this Bureau.

6. Comparison with Charts

There are no charts of the area by this Bureau.

7. Condition of Survey

a. The sounding records and Descriptive Report are complete and comprehensive.

b. The field plotting was accurately done.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

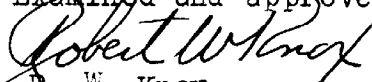
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Examined and approved:



H. R. Edmonston
Chief, Nautical Chart Branch



R. W. Knox
Chief, Division of Charts



L. S. Hubbard
Chief, Section of Hydrography



W. M. Scaife
Chief, Division of Coastal Surveys

RHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~

17 February 1950

Division of Charts: R. H. Carstens

Plane of reference approved in
4 volumes of sounding records for

HYDROGRAPHIC SHEET 7694

Locality Deep Creek to International Boundary, Lake Roosevelt,
Washington

Chief of Party: J. T. Jarman in 1948

Plane of reference is a sloping gradient,

~~xxxxxx~~ 1288.6 ft. at Deep Creek

1290 USBR 1937

~~xxxxxx~~ 1292.6 ft. at International Boundary

1294 USBR 1937

corresponds to flow of approx. 40,000 sec.-ft.

-1.7 ft. on tide staff No. 1 at Deep Creek

2.2 ft. on tide staff No. 2 at Deep Creek

61.5 ft. below B. M. 808 T WWPC

-1.5 ft. on tide staff at International Boundary

56.7 ft. below B. M. 1356 (USGS)

~~Condition of records satisfactory except as noted below~~

NOTE: There were 4 gages and staffs located as follows:

Cable Gage staff, Lower Boundary Gage, Gage 4 staff, and Upper Deep Creek staff. These gages and staffs were used by the Hydrographic party to determine tidal characteristics between Deep Creek and International Boundary.

Section E.C. McKay

Chief, Division of Tides and Currents.

RAC

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~

17 February 1950

Division of Charts: R. H. Carstens

Plane of reference approved in
8 volumes of sounding records for

HYDROGRAPHIC SHEET 7691

Locality Northport, Lake Roosevelt, Washington

Chief of Party: J. T. Jarman in 1948

Plane of reference is

~~xxxxx tide staff xxx~~ 1290 feet (USBR ¹⁹³⁷ Datum of Leveling)
~~xxxxx datum xxx~~ or 1288.6 feet (Sea-level datum of 1929)

-1.1 ft. on tide staff at Lower Little Dalles
74.8 ft. below B. M. CP-265

1.6 ft. on tide staff at Onion Creek
22.7 ft. below B. M. G-10

-0.6 ft. on tide staff No. 1 at Deadmans Eddy
2.4 ft. on tide staff No. 2 at Deadmans Eddy
55.8 ft. below B. M. WC Sec. 4 (GLO)

~~Conditions of observations satisfactory except as noted below~~

-1.7 ft. on tide staff No. 1 at Deep Creek
2.2 ft. on tide staff No. 2 at Deep Creek
61.5 ft. below B. M. 808 (TWWPC)

E. C. McKay
Section
Chief, ~~Division of Tides and Currents~~

