
Form 804
U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey: Topographic
Field No.: Ph-40,000
Office No.: 10964

LOCALITY
State: Idaho
General locality: Clearwater County
Locality: Orofino

July 1959
CHIEF OF PARTY
Victor E. Serena

LIBRARY & ARCHIVES
DATE: Jul 4, 1962

USCOAX-DC 5067
DESCRIPTIVE REPORT - DATA RECORD

T-10964

Project No. (II): 40,000-895
Quadrangle Name (IV): (PART II)

Field Office (II): Orofino, Idaho
Chief of Party: Victor E. Serena (Photogrammetry)

Photogrammetric Office (III): Baltimore, Maryland
Officer-in-Charge: O. S. Risvold (Geodesy)

Instructions dated (II) (III): 27 April 1959
Ret. Instructions: 8 April 1959

Copy filed in Division of
Photogrammetry (IV)

Method of Compilation (III): Kelsh Plotter

Manuscript Scale (III): 1:24,000
Stereoscopic Plotting Instrument Scale (III): 1:7200

Scale Factor (III): 1.000

Date received in Washington Office (IV):

Date reported to Nautical Chart Branch (IV):

Applied to Chart No. Date:

Date registered (IV):

Publication Scale (IV): 1:24,000 Publication date (IV):

Geographic Datum (III): N.A. 1927

Vertical Datum (III):
Mean sea level except as follows:
Elevations shown as (25) refer to mean high water
Elevations shown as (2) refer to sounding datum
i.e., mean low water or mean lower low water

Reference Station (III):

Adjusted
Unadjusted

Lat.: Long.: Lat.: Long.

Plane Coordinates (IV):
State: Zone:

Y= X= Y= X=

Roman numerals indicate whether the item is to be entered by (II) Field Party, (III) Photogrammetric Office,
or (IV) Washington Office.

When entering names of personnel on this record give the surname and initials, not initials only.
Areas contoured by various personnel
(Show name within area)
(II) (III)
FIELD INSPECTION by (II): E.L. Williams
               R.B. Melby

PLANETABLE CONTOURING by (II):

COMPLETION SURVEYS by (II):

MEAN HIGH WATER LOCATION (III) (State date and method of location):

PROJECTION AND GRIDS RULED by (IV): D.M. Brant

PROJECTION AND GRIDS CHECKED by (IV): H.P. Eichert

CONTROL PLOTTED by (III): D.M. Brant

CONTROL CHECKED by (III): H.P. Eichert

RADIAL PLOT OR STEREOSCOPIC CONTROL EXTENSION by (III): W.A. Kuncic

STEREOSCOPIC INSTRUMENT COMPILED (III):
   Planimetry: E.L. Williams
   Contours: M.D. McEvoy

MANUSCRIPT DELINEATED by (III):

PHOTOGRAMMETRIC OFFICE REVIEW by (III):

ELEVATIONS ON MANUSCRIPT CHECKED by (II) (III): Washington Office Review Unit

Date: July 1959

Date: 11/27/59

Date: 11/27/59

Date: 11/27/59

Date: 11/27/59

Date: 9/1/59 to 11/30/59

Date: 3/23/60

Date:
DESCRIPTIVE REPORT - DATA RECORD

Camera (kind or source) (iii): C&S type "W" 6" focal length

PHOTOGRAPHS (III)

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Reference Station:
Subordinate Station:
Subordinate Station:

Washington Office Review by (IV): S.G. Blankenbaker

Final Drafting by (IV): Washington Office Drafting Unit

Drafting verified for reproduction by (IV): J.J. Strafeier - A.K. Heywood

Proof Edit by (IV): A.K. Heywood

Land Area (Sq. Statute Miles) (III): 54
Shoreline (More than 200 meters to opposite shore) (III):
Shoreline (Less than 200 meters to opposite shore) (III):
Control Leveling - Miles (II):
Number of Triangulation Stations searched for (II): Recovered: Identified: 2
Number of BMs searched for (II): Recovered: Identified: 18
Number of Recoverable Photo Stations established (III):
Number of Temporary Photo Hydro Stations established (III):

Remarks:

Proj. Work Sheets
Date: Review Jan. thru Mar. 1960

Date: Project Drafting
Feb. thru May 1960

Date: Project Edit
Nov. thru May 1960
PROJECT PH-40,000-895

Topographic Mapping Scale 1:24,000

BRUCES EDDY DAM SITE

NORTH FORK CLEARWATER RIVER, IDAHO

See plot sketch. Two additional manuscripts added to project.

- Descriptive Report T-10965 -

Official Mileage For Cost Accounts

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SUMMARY TO ACCOMPANY DESCRIPTIVE REPORTS
for
T-10958  T-10952
T-10959  T-10963
T-10960  T-10964
T-10961  T-10965

The eight 1:24,000 scale, 40 ft. contour interval topographic maps covered by this Summary comprise Part I of Project 40,000-395. The project location is the site and vicinity of the proposed Brucee Eddy Dam and reservoir on the Clearwater River in Idaho. Part I (eastern section) covers a part of the North Fork of the Clearwater River and its drainage area. Part II (western section) extends along the Clearwater River from Lewiston to Ahsanka, Idaho and will consist of eleven 1:6,000 scale, 10 ft. contour interval topographic maps.

This is a combined photogrammetric mapping and geodetic control survey project undertaken by the Coast and Geodetic Survey as a specialized surveying service to the Corps of Engineers on a reimbursable basis.

The field work was accomplished as a joint operation by the Divisions of Photogrammetry and Geodesy. Geodetic survey parties recovered and established horizontal and vertical control by conventional triangulation and leveling methods. Photogrammetrists were assigned to geodetic parties to assist in geodetic work and to perform the photogrammetric phases of the control work. Field inspection for interpretation of the photographs was accomplished by photogrammetrists. Photography for this section of the project was flown by the Coast and Geodetic Survey. It consists of 5 strips of "W" camera photographs at an approximate contact scale of 1:40,000.

The work provides horizontal and vertical control for future large scale mapping by the Corps of Engineers and topographic maps for use in preliminary planning for the proposed dam and reservoir. Coast and Geodetic Survey field work and mapping accomplished for this project will be used by the Forest Service for standard 7½ minute quadrangle mapping in the area.

An "Index of Project Material on File" is a part of the Project Completion Report. Field photographs, field notebooks, control station identification cards, and copies of the IBM records were supplied the Corps of Engineers. Duplicate sets of CSI cards are on file in the Division of Photogrammetry. Duplicate sets of field photographs used in horizontal bridging (bridge points and horizontal control) are on file in the Division of Photogrammetry.

* Two additional (supplemental) manuscripts added to project.
  T-10958A{filed with T-10958}
  T-10963A{filed with T-10963}

No Descriptive Reports filed for these small area maps.
DATA INCLUDED IN THE DESCRIPTIVE REPORT FOR

T-10965

PH 40,000 - 895 (Part I)

Stereo-instrument compilation report
Bridging report
Triangulation stations positions
Triangulation sketch
Photo index

Field Inspection Report
Horizontal and vertical bridging was done by stereoplanigraph in the Washington Office. "Work Sheets" were compiled and inked in the Baltimore Office. The maps were scribed and printed in one color in the Washington Office. No field edit was accomplished on the project.

The "work sheets" and accompanying field and office data were reviewed in the Washington Office. Verification of drafting was accomplished prior to reproduction.

The maps comply with the National Horizontal Standards of Map Accuracy. Bridging problems on two strips are discussed in the Bridging Report. The questionable areas on two strips fall outside the project area.

Vertical bridging was satisfactory. The tree cover common to much of the project presented a problem in contouring. Although the heights of some timber stands were measured by helicopter, the accuracy of contours is questionable in areas of heavy growth.

Reviewed by

[Signature]

S. D. Blankenshaker

Approved by:

[Signature]

J. L. Land

Chief, Review and Drafting

Photogrammetry Division

[Signature]

E. W. Young

Chief, Photogrammetry Division

[Signature]
SCOPE

This report summarizes the activities of the C&GS on reimbursable Project 40,000-895, Clearwater River, Idaho.

For convenience of reporting, the project is divided into two parts. Part I is designated as the area east of Orofino in the vicinity of the Bruce Eddy Dam site along the North Fork Clearwater River. Part II encompasses that area from Lewiston along the Clearwater River to Ahsahka, Idaho.

A project layout accompanies this report and may be referred to for these areas.

For clarity, each phase of the project is discussed under separate heading.
General

On January 9, 1959, negotiations were initiated between Admiral Pierce of the USGS and Mr. C. W. Waggoner of the Corps of Engineers, Walla Walla District. General specifications were outlined at that time. On January 27, 1959, Mr. Waggoner visited the Washington Office to discuss details of the project.

Negotiations were continued by an exchange of correspondence which resulted in the acceptance of the project on a reimbursable basis to be completed in the spring of 1960.

Purpose

The Army Engineers propose to build one of the world's larger dams located on the North Fork of the Clearwater River near Orofino, Idaho, designated as Brucer Eddy Dam Site.

Existing map coverage was limited to the 1:250,000 series. The dam site area (Part I) required the mapping of nine 1:24,000 surveys and eleven (Part II) 1:6,000 surveys.

The 1:24,000 series were to provide the Engineers with reconnaissance maps for preliminary planning. Field work was to provide documented horizontal and vertical control for future larger scale mapping and development of the reservoir site.

Photography

The photography on Part I was flown by Photo Mission 702 of the USGS. A flight map with five carefully oriented lines giving the most advantageous placement for stereoscopic bridging was furnished. Excellent adherence to these flight lines by the Photo Mission was obtained. Photography was of good quality taken with the 6" Wild Aviogon camera at 1:36,000 scale on August 25, 1959.

The photography on Part II was taken by Pacific Aerial Surveys under contract to the Corps of Engineers. Specifications as to altitude, endlap and camera were set by USGS.
Photography continued

The first film was received and examined in August 1959. Some strips were rejected and subsequently rephotographed. The photography was of poor quality in one quadrant due to exhaust of aircraft. Tests proved that parallax could be cleared using this photography. Difficulty was encountered during the vertical bridging operations tying models together. (See side heading "Map Accuracy").

Project Diagram

Soil conservation photography taken 1954 at 1:60,000 scale was used to lay an uncontrolled mosaic for use as a project diagram. Nine sheets were laid out to conform to the drainage area. They do not conform to the standard 1:24,000 topographic series. Copies of this diagram were forwarded to Mr. Waggoner for approval.

Sheet Size

Manuscript dimensions on Part I were restricted to 21" x 25½" overall for use in a bound brochure to be assembled by Corps of Engineers. The scale was 1:24,000 and contained both polyconic and state grid.

Overall size on Part II was 29" x 42", the format taken from samples furnished by the Engineers. Grid ticks at 2500' intervals were scribed. No polyconic projection was shown. The sheets were skewed so that the Clearwater River tended to bisect each sheet.

Field Operations

During operational planning of this project, it became evident that field operations would be difficult due to dense woods (Part I), mountainous terrain (Parts I and II) and lack of access roads (Part I).

The use of helicopters was proposed to overcome these difficulties and later proved to be worthwhile.

Any interior areas serviced by roads were many times inaccessible during the initial phase of field operation, due to ruts and washouts caused by spring thaws or deadfalls caused by storms. Later, Forest Service personnel arrived to clear fire lanes permitting survey parties to enter some station sites.
Horizontal Control (Parts I and II)

All previously established stations within the project area were recovered by the reconnaissance party. Additional control needed for aero-triangulation was established by conventional triangulation methods. A sketch of the triangulation scheme is included with this report.

Control recovered or stations selected by the reconnaissance party prior to aerial photography were premarked whenever possible.

58 stations were identified by direct or substitute station methods in Part I and 34 in Part II.

Vertical Control (Part I)

Bureau bench marks of second-order accuracy were established along the river to form the basis for control leveling in the project area. Elevations were extended from these lines and carried through the triangulation net by reciprocal vertical angle observations. Additional elevations were achieved using tellurometer derived distances and vertical angles. Closed trigonometric theodolite and short hand level loops were employed to make final connections to vertical control points.

Vertical control points were identified in pairs normal to the flight line and spaced every third model. In addition, the elevation of any identifiable features existing along level lines which could be readily cut in from triangulation stations was also given.

In Part I, the elevations of 183 vertical control stations were determined and in Part II, 61 such stations were recorded. In addition, the heights of all triangulation stations within the project area were determined.

All vertical control was marked by the field party with copper weld or 1" iron pipe suitably stamped.

Field Inspection

Field inspection was complete within the limits of photography on Part I and within the limits of the 1:16,000 scale photography on Part II. This included classification of roads, buildings, vegetation and drainage. Also included was the identification of all bench marks whether or not they were to be used as control for model points.
Office Operations

Part I

Alternate strips were bridged horizontally and vertically by the stereoplanigraph and adjusted analytically by IBM programming.

The density of horizontal control averaged four to six stations per strip and sufficient vertical control was furnished by pairs of elevations normal to the flight line every third model.

Additional horizontal and vertical control was established during the area triangulation to enable each model to be declinized by Keish methods.

Original requests by the Army Engineers for a 50' interval was modified at the urging of the Geological Survey to 40'. These surveys could then be utilized by them for standard 7½' quadrangles.

Part II

The 1:30,000 scale photogeology was bridged by stereoplani- graph methods to establish supplemental horizontal control points sufficient in density to fix the position of each 1:16,000 scale photograph.

The 1:16,000 scale photographs were then bridged both horizontally and vertically providing enough control for individual models to be compiled by the Keish method.

These Keish models were compiled on 1:6,000 scale work sheets with a contour interval of 10'. All data with the exception of a woods overlay was delineated on these work sheets.

Instructions limited the extent of contouring to approximately 400' above the river elevation.

Drafting and Edit

All work sheets were reviewed prior to editing by the Review Section. The work sheets were then parcelled into manuscripts and edited after which the manuscript was edited prior to reproduction.
MAP ACCURACY

Every attempt was made throughout the project to maintain the standards of National Map Accuracy.

Field parties charged with the responsibility of selecting vertical control points were instructed to choose a site varying less than one foot in a fifteen foot radius. This in itself required diligent searching.

Instrument operators selecting additional vertical control whose elevations were to be determined by EDM adjustment chose as well defined points as possible. Six such elevations were furnished each Kelah model, four near the outer edges and two near the physical centers, to insure that absolute orientation would be in the same plane.

Tree heights were determined by helicopter as an aid to the operator delineating contours.

Horizontal control was plentiful. A minimum of six stations appeared in each bridged strip of the 1:36,000 and 1:30,000 scale photography. Supplemental points established by stereoplanigraph to control the 1:16,000 scale photography was further refined by adjusting each strip by EDM methods.

Conclusions

Part I

In areas free of woods and in partially wooded areas (less than 50%) standard accuracy may be expected. In areas of dense woods, expressions may be weak with smoother contours as compared with open areas.

Using tree heights as guides, attempts were made to "dig in" with the floating mark utilizing the occasional openings in the trees to check the placement of the contour interval. These areas may be less than standard accuracy and cannot be verified except by extensive field edit.

Part II

The 1:16,000 scale photography as noted in a previous side heading was of generally poor quality. Approximately one-quarter of each exposure appeared to be out of focus and was apparent in the same quadrant on each photograph.
This inhibited the adjustment of the vertical bridging technique since the stereoscopy in these areas was "soft" the instrument elevations of selected images were hard to determine. Averages of many readings were used. When these instrument elevations were later adjusted in the IBM, the effect of the "softness" contributed to errors in the determined elevations.

In general, contours should be found to be of standard accuracy with isolated random areas in error of more than 1 contour interval.

**Transmitted Data (Part I)**

Field photographs (1:40,000):

- 59-W-5590 thru 59-W-5616
- 59-W-5551 thru 59-W-5588
- 59-W-5520 thru 59-W-5549
- 59-W-5590 thru 59-W-5518
- 59-W-5499 thru 59-W-5488

426 control station identification cards
4 Eye level books
6 Sketch books
3 IBM lists (showing instrument horizontal and vertical control, positions and elevations)
1 List bench mark positions (Phase 1 - 1959)
5 Pages substitute station positions (Form 164)
1 Geographic Names report
1 Field Inspection report
1 Triangulation sketch (Phase 1 - 1959)
1 Triangulation sketch (Phase 2 - 1959)
1 Project diagram
1 Triangulation descriptions (1959 stations)
74 Pages adjusted horizontal control data (1959)
1 Descriptions and elevations vertical control data
1 Air photo index
1 Each aerial film positive (sheets 1 thru 8)
3 Each Oxid film print (double weight) (sheets 1 thru 8)

**Transmitted Data (Part II)**

Field Photographs (1:30,000):

- AG 100 2488 thru 2503
- AG 100 2508 thru 2522
Transmittal Data (Sheet II) 10-60:

AG 100 2359 thru 2364
AG 100 2370 thru 2381
AG 100 2385 thru 2396
AG 100 2403 thru 2414
AG 100 2420 thru 2425

2. Each Croner film positives (sheets 1 thru 11)
3. Each ozalid prints, double weight (sheets 1 thru 11)

Project Extension

On June 20, 1960, Mr. Waggoner telephoned requesting additional compilation of small areas in the vicinity of Elk Creek and Breakfast Creek, designated as sheets 30 and 74 respectively. These sheets were compiled in like manner and forwarded August 19, 1960.

Respectfully Submitted:

[Signature]

I. K. Haynes

Approved:

[Signature]

Charles Flumer
Chief, Cartographic Branch

L. V. Remsen
Chief, Photogrammetry Division

T-10958A, T-10963A
48. GEOGRAPHIC NAMES LIST

Armstrong Butte
Benton Butte
Benton Creek
Bingo Saddle
Brices Eddy (Title)

Flkberry Creek

Gleason Creek
Granddad Creek
Gynpo Creek

Hughes Point

Little Meadow Creek
Little North Fork Clearwater River
Long Creek

McIntyre Creek

North Fork Benton Creek
North Fork Clearwater River
Nylon Creek
Telephone Creek
Thunder Creek

GEOGRAPHIC NAMES SECTION
6 JUNE 1960
### NAUTICAL CHARTS BRANCH

**SURVEY NO. T-10964**

Record of Application to Charts

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