



State of Idaho

DEPARTMENT OF WATER RESOURCES

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PHILIP E. BATT
GOVERNOR

KARL J. DREHER
DIRECTOR

January 27, 1997

Portneuf-Marsh Valley Canal Co.
C/O Ervin Gilbert, Chairman
Downey, Id 83234

Re: Chesterfield Reservoir Capacity Survey

D29-2065

Dear Mr. Gilbert

The Department has completed the reservoir survey of the Chesterfield Reservoir. As you know, several years ago the Department requested that a survey be conducted to accurately determine the capacity of the reservoir. During the fall of 1993 the USDA - Soil Conservation Service performed a survey where control points were set around the perimeter of the reservoir and depth measurements were taken through sections of the reservoir. Their results estimated 24,621 acre feet of storage capacity up to elevation 5398, the spillway invert elevation.

The Department utilized the SCS survey data and included computer digitized data of the reservoir high water elevation (5398) from the USGS 7.5 minute map of the reservoir. A 3-dimensional map was generated and volumes calculated utilizing computer modeling. In our attempt to confirm the storage capacity we found the computer model had generated several topographic humps in the reservoir bottom. Further review of the data base indicated that insufficient reservoir depth data points had caused the computer model to extrapolate inaccurate topography of the reservoir bottom. The volume calculations estimated 18,000 acre feet of storage.

In order to rectify the discrepancy it was decided to build on the existing data that had been compiled and supplement the survey with additional reservoir depth data points. Through a joint effort with the SCS, Portneuf-Marsh Valley Canal Company and IDWR, a plan was devised where by:

- The SCS would locate their existing control points and perform a field examination with IDWR to familiarize us with locations and background information.
- The Portneuf-Marsh Valley Canal Company would supply a boat and crew to provide navigation for additional depth survey measurements.

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- IDWR would perform surveying, both instrument and GPS surveying of the high water level followed by compilation and computer generation of a topographic model of the reservoir bottom. Additionally a stage storage volume curve would be computed of the reservoir.

Through the joint efforts of the participating parties approximately 200 reservoir depth determinations were made and the reservoir high water level was surveyed. The Department, thence compiled the data utilizing the SCS's data and new data re-modeling the reservoir topography and calculating the storage volume. A map was generated delineating the reservoir topography, survey depth locations and stage storage curve graph.

IDWR's calculations of the reservoir capacity up to the 5398 elevation was computed to be 20,405 acre feet. Our records indicate that gage height 47 corresponds to elevation 5398 the spillway elevation. The Department will confirm the correlation of the spillway invert to the gage height this summer. If there are any modifications to gage height verses spillway invert we will adjust the stage storage curve accordingly.

The Department would like to express our appreciation and cooperation of the Soil Conservation Service and the Portneuf-Marsh Valley Canal Company for the assistance they have provide in making this survey possible.

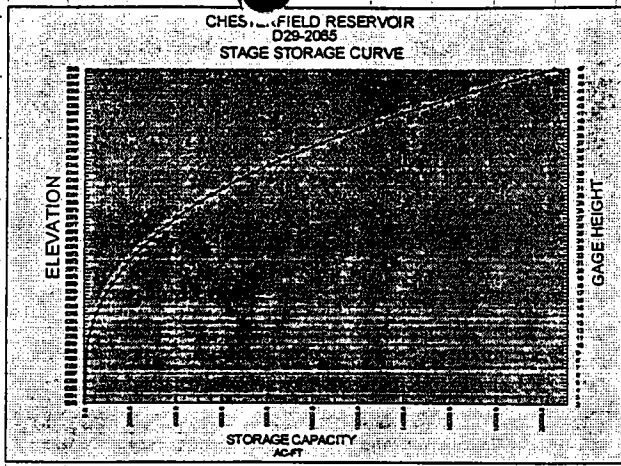
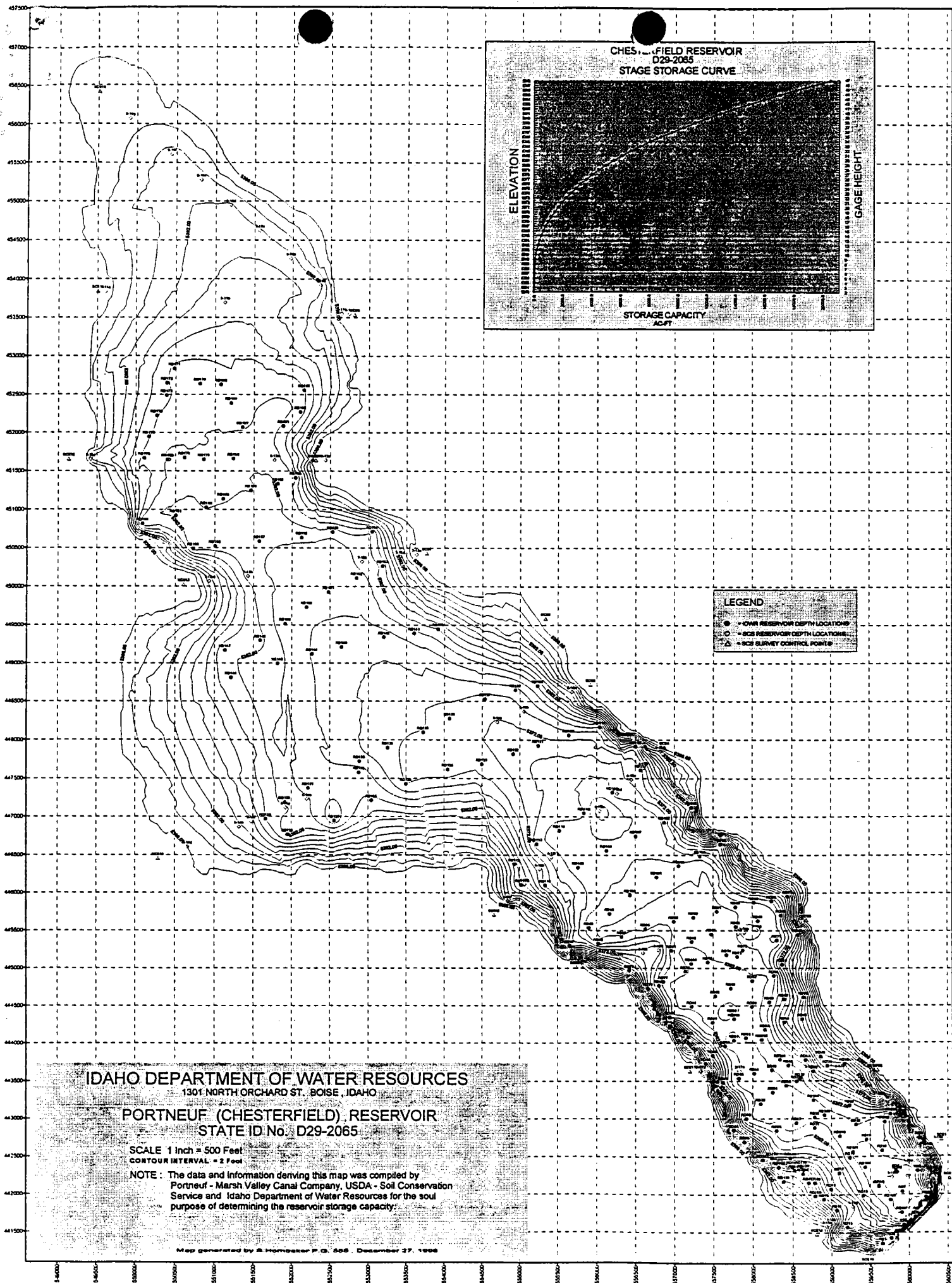
Sincerely,



Sonny Hornbaker P.G
Dam Safety

cc:

Eastern Region - Dave Walrath
SCS - Tom Allen



LEGEND

- OWR RESERVOIR DEPTH LOCATIONS
- RCS RESERVOIR DEPTH LOCATIONS
- △ RCS SURVEY CONTROL POINTS

IDAHO DEPARTMENT OF WATER RESOURCES
1301 NORTH ORCHARD ST. BOISE, IDAHO

PORTNEUF (CHESTERFIELD) RESERVOIR
STATE ID No. D29-2065

SCALE 1 inch = 500 Feet
CONTOUR INTERVAL = 2 Feet

NOTE: The data and information deriving this map was compiled by
Portneuf - Marsh Valley Canal Company, USDA - Soil Conservation
Service and Idaho Department of Water Resources for the sole
purpose of determining the reservoir storage capacity.

Map generated by S. Hombaker P.O. 505, December 27, 1998

CHESTERFIELD RESERVOIR

D29-2065

STAGE STORAGE CURVE

