



Dam Safety Section

TRIP REPORT

TO: Dam File 75-14465
FROM: John Falk, PE
DATE: July 13, 2009
SUBJECT: Chipps Creek Reservoir

Reviewed: 

On Thursday 6/25/09, I visited the referenced off-channel impoundment located ~100 feet south of Oliver Drive in Salmon, ID (Photo 1). The weather was mostly sunny, warm, and dry. Based on my site observations, the dam consists of an earthen structure constructed near the base of a long, northeast sloping hill in Section 2, T21N, 21E, Lemhi County. The structure appears to have been built by the “cut and fill” method using native soils excavated from the reservoir and placed in a perimeter berm against the hillside. The exposed fill materials are composed predominately of reworked glacial outwash (clay/ silt → rounded cobbles up to 20” diameter). The age of the structure is unknown, but the size of trees growing on the north downstream slope suggest at least 15-20 years.

The reservoir apparently is filled by a combination of surface runoff from hillside drainage and water from a developed artesian spring (Photo 2). Flow into the reservoir at the time of the site visit was 30 gpm, or less. An emergency spillway did not appear to exist; neither could I locate a low level outlet conduit. Seepage was evident along the north and east, downstream toe of the embankment. Discharge rates were difficult to estimate due to a long strip of rounded river-rock that had been placed adjacent to Oliver Drive. This coarse gravel appears to function as a “French Drain” for the express purpose of diverting leakage from the reservoir away from the roadway (Photo 3). All seepage from the dam appeared to flow toward a common point at the downstream toe where it was routed into a small drainage ditch, presumably for irrigation purposes (Photo 4).

Design drawings apparently do not exist. Based on inspection and observation, the following dimensions were obtained for the existing dam and reservoir:

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|-------------------------|-------------------------|---------|
| • Embankment Height * | 15 feet (est) | Photo 5 |
| • Crest Width | 40 feet (tape-measured) | |
| • Freeboard | 1 foot (est) | Photo 6 |
| • Downstream Slope | 4H:1V (est) | |
| • Pool Surface Area | 4 acres (est) | Photo 7 |
| • Reservoir Capacity ** | 30 acre-feet | |

* Measured from top of dam to downstream toe at maximum section

** Volume calculated using formula [(Height x Surface Area) x 0.5] ; does not include subgrade storage

I also investigated the drainage path below the dam. A single residence on Oliver Drive exists in close proximity to the dam. In the event of a catastrophic dam failure and sudden release of reservoir contents, this property likely would experience significant flooding damages. A smaller, more shallow, and younger reservoir is located about one-quarter mile downstream. It appears that flood water from a catastrophic failure of the upper dam likely would overtop this pond, resulting in its failure. For these two reasons, the existing upper structure is rated a Significant-hazard dam.

This project exists at an elevated risk for failure due to 1) the lack of an emergency overflow spillway to prevent overtopping of the embankment and 2) the absence of a low-level outlet conduit that could be used to lower or to drain the reservoir in the event of an emergency. Lastly, the lack of design drawings or construction details, together with the seepage along the toe of the slope contributes to my concern regarding the integrity of the embankment.

I recommend this dam be modified to include the installation of an emergency overflow spillway. Issuance of a formal Water Right to the owner(s) of this dam should not be approved until such repair is implemented to the satisfaction of IDWR Dam Safety. In the interim, this structure will be added to the state inventory of dams for regular inspection.



Photo 1 – Aerial view showing reservoir and its relationship to Oliver Drive. Note the location of the residence near the intersection of Oliver Drive and Sacajawea Road.

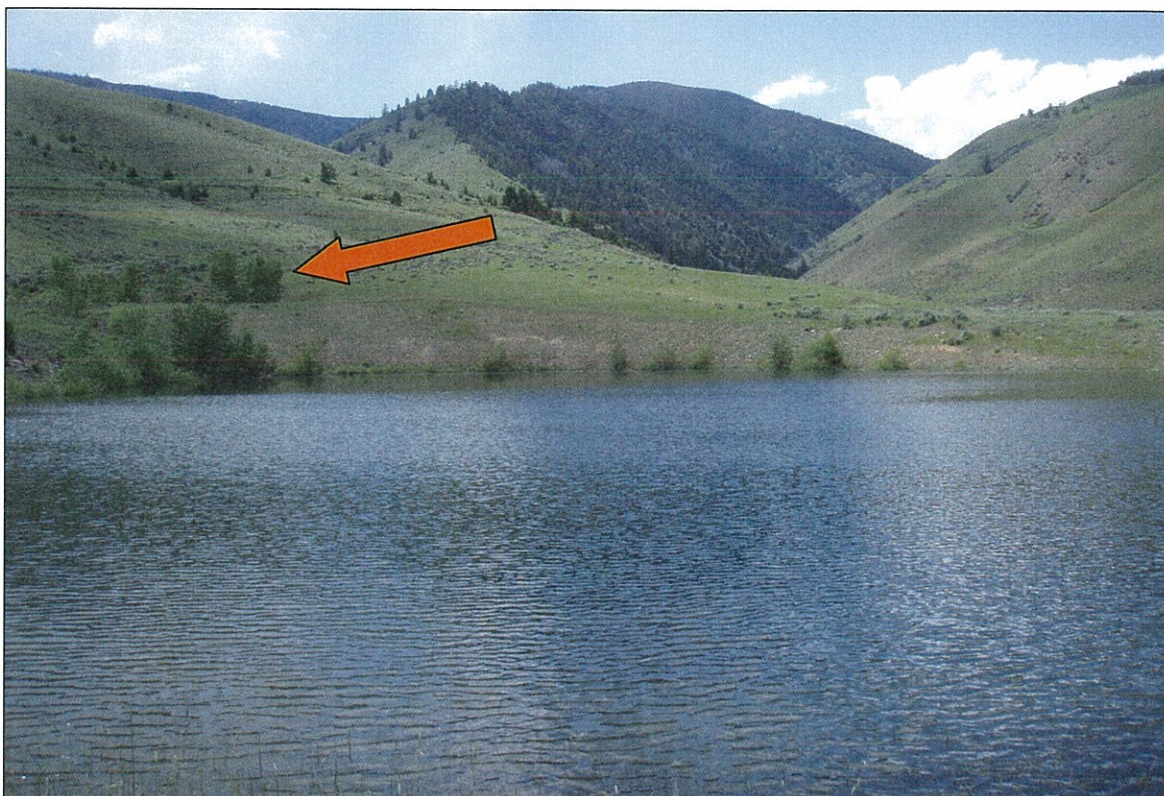


Photo 2 (6/25/09) - Upstream view from dam crest looking across the reservoir to the primary source of water, supplied by a developed, artesian spring (shown by arrow).



Photo 3 (6/25/09) - Oliver Road, looking east along the north side of the existing embankment. Seepage from the toe of the slope is collected in the gravel drain material (shown by arrow). Note the heavy growth of trees and brush on the downstream slope of the dam.



Photo 4 (6-25-09) - Facility for collection of seepage from the dam. This feature exists on the east side of the embankment. At the time, the rate of flow in the ditch (right) was estimated ~20-25 gpm.



Photo 5 (6/25/09) - View looking at the downstream slope of the dam near maximum section. Note the location of Oliver Road (right), and the heavy growth of vegetation on north side of the embankment.



Photo 6 (6/25/09) - View from the back of the reservoir looking east, toward the crest of the embankment. Note the elevated water level referenced by the submerged vegetation.



Figure 7 (6/25/09) - Overview of existing dam (background) and reservoir. The treed area in the photograph right-front corner is the channel carrying water from the spring to the reservoir.



Photo 8 (6/25/09) - Eastward view from Sacajawea Road, located near downstream toe of existing (Chipps) dam. The small pond in the foreground lies within the inundation zone of the existing dam.



Photo 9 (6/25/09) - Embankment from a downstream vantage point. The crest is highlighted with a colored line stretched above its length. In foreground is the small pond (shown above).