

## Erickson Dam (DAMID# 020637) Hydrologic and Hydraulic Analysis Greeley, Colorado

**Client:** Mr. David Calvin  
5801 West 11<sup>th</sup> Street  
Suite 300  
Greeley, CO 80634



A previously non-roster dam was modified by the owner who unknowingly created a jurisdictional structure. Anderson Consulting Engineers, Inc. was contracted by the owner to perform an after-the-fact assessment of the dam to determine compliance with the Rules and Regulations promulgated by the Colorado Office of the State Engineer. This project involved the following steps:

1. Verification of the jurisdiction status of the dam;
2. Determination of the applicable Hazard Classification of the dam;
3. Evaluating the existing emergency spillway's adequacy;
4. Evaluating the dam's freeboard requirements;
5. Performing an Incremental Damage Analysis;
6. Developing design plans and specifications for improvements to bring the structure into compliance; and
7. Compiling a final construction report.

The National Weather Service's BREACH model was used to determine breach parameters. The breach parameters were used in the HEC-1 model to develop and route the breach hydrograph. A hazard classification evaluation was performed to determine the potential consequences of the subject dam failure on residents and property below the dam and to identify the standards for the investigation, design, and construction of any improvements to the dam facility. The HEC-RAS model was utilized to determine and plot approximately 2 miles of inundation limits downstream of the Erickson Reservoir. Inundation limits were plotted on dam owner provided 2-foot contour interval topography as well as USGS 10-foot contour interval topography. Two major bridge crossings and a downstream reservoir were located in the inundation zone and evaluated for damages.

An evaluation of the existing emergency spillway capacity was performed to determine if the spillway was large enough to satisfy Colorado Office of the State Engineer criteria. In support of the spillway evaluation analyses were performed to determine the Probable Maximum Precipitation (PMP) and the resulting Probable Maximum Flood (PMF). The PMP and PMF analyses were performed using procedures found in Hydrometeorological Report No. 55a (HMR 55A) and the USBR's "Flood Hydrology Manual". The existing spillway did not meet current OSE requirements; therefore an Incremental Damage Analysis was completed to justify an Inflow Design Flood (IDF) smaller than the required IDF. The IDA determined that the minimum IDF would safely pass through the existing spillway. Therefore, no improvements to the existing spillway were required. However, given the minimum IDF, dam embankment improvements were required in order to meet freeboard requirements. All analysis and designs developed by Anderson Consulting Engineers, Inc. were submitted to and subsequently approved by the Colorado Office of the State Engineer.



**Erickson Reservoir and Dam Looking North.**