Memo

Date:	Tuesday, June 02, 2026
Project:	Ridenbaugh Headworks Modernization
To:	Dave Rader, ACHD Project Manager
From:	Mike Schubert, PE (HDR) Brandon Hobbs, PE, BC.WRE, CFM (HDR) Kyler Ashby, PE (HDR)
Subject:	NMID Eckert and Ridenbaugh Cofferdam Hydraulic Analysis

Introduction

Dewatering efforts associated with constructing the next phase of the Ridenbaugh headworks modernization will require a coffer dam to be installed on the east (descending right) end of the new diversion structure. The Eckert Road bridge replacement project timeline will overlap with the Ridenbaugh project and will also require dewatering using coffer dams. The Nampa & Meridian Irrigation District (NMID) requested HDR, Inc. (HDR) perform a hydraulic analysis of the anticipated Ridenbaugh and Eckert Road coffer dam emplacements. The analysis will examine the hydraulic conditions and determine whether the Eckert Road coffer dams will have any significant impact on the Ridenbaugh coffer dam. This memo documents the results of the hydraulic analysis.

Hydraulic Model

This analysis utilizes two-dimensional (2D) hydraulic modeling in the Hydrologic Engineering Center River Analysis System (HEC-RAS) version 6.6 software. Model terrain is based on the most recent LiDAR collected in the modified to include the as-built conditions at the Ridenbaugh Diversion in fall of 2026. The range of upstream river flows run for the simulations is from 200 to 1600 cubic feet per second (cfs).

The anticipated layout of the Ridenbaugh coffer dam was provided by NMID and incorporated into the 2D model. The Eckert Road bridge project will require two separate coffer dam installations for bridge pier foundation construction, one on the left bank (west side) and one on the right bank (east side). The two conceptual layouts were provided by the bridge design engineers and incorporated into the model terrain. Figure 1 and Figure 2 show the layouts for the coffer dams used in the simulations.

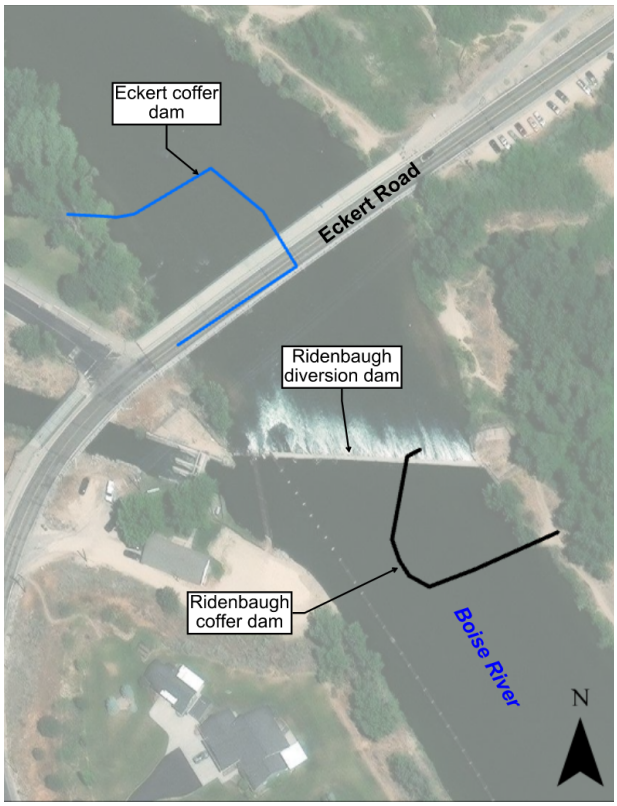

Figure 1: Coffer dam layouts with Eckert coffer dam on west side (Scenarios 2 and 5).

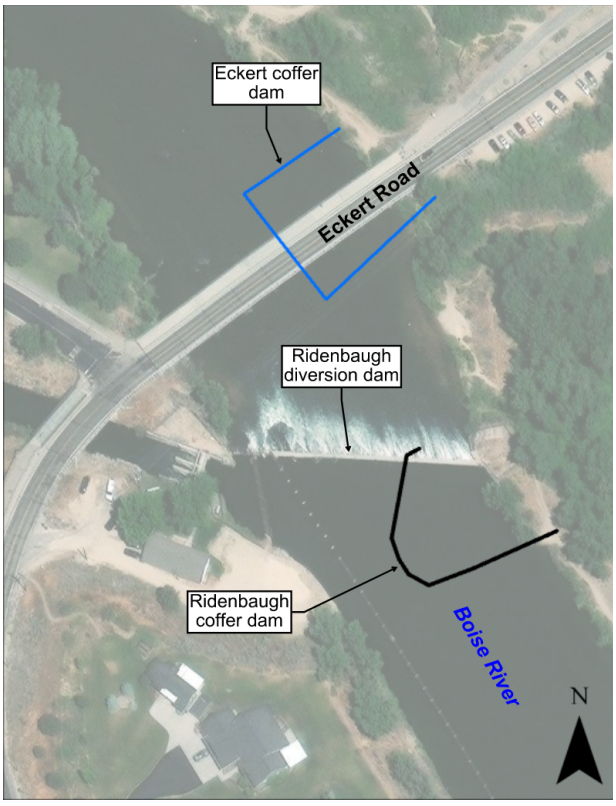

Figure 2: Coffer dam layouts with Eckert coffer dam on east side (Scenarios 3 and 6).

A total of six scenarios were run and analyzed for this hydraulic analysis. The first three scenarios (Scenarios 1, 2, and 3) assumed that the stop log elevation at the existing diversion dam would be set at 2754.7 feet and river flows would enter the Ridenbaugh Diversion Channel and flow into the Ridenbaugh canal at a rate of 400 cfs. Scenario 1 only includes the Ridenbaugh cofferdam. Scenarios 2 and 3 include the Eckert Road coffer dam installed on the west and east side of the Boise River, respectively.

The other three scenarios (Scenarios 4, 5 and 6) assumed that the stop logs would be removed at the existing diversion dam and river flows would be prevented from flowing into Ridenbaugh canal. Scenario 4 only includes the Ridenbaugh coffer dam. Scenarios 5 and 6 include the Eckert Road coffer dam installed on the west and east side of the Boise River, respectively.

Results

Water surface elevations and velocity data for each scenario were queried at specific locations around the Ridenbaugh coffer dam in the model, shown in Figure 3. The water surface elevation data was taken just upstream of the Ridenbaugh coffer dam. The water velocity data was taken in the Boise River channel where the flow is the most constricted by the Ridenbaugh coffer dam. These locations represent critical points to determine what effects the installation of either the east or west Eckert coffer dams may have on the Ridenbaugh installation.

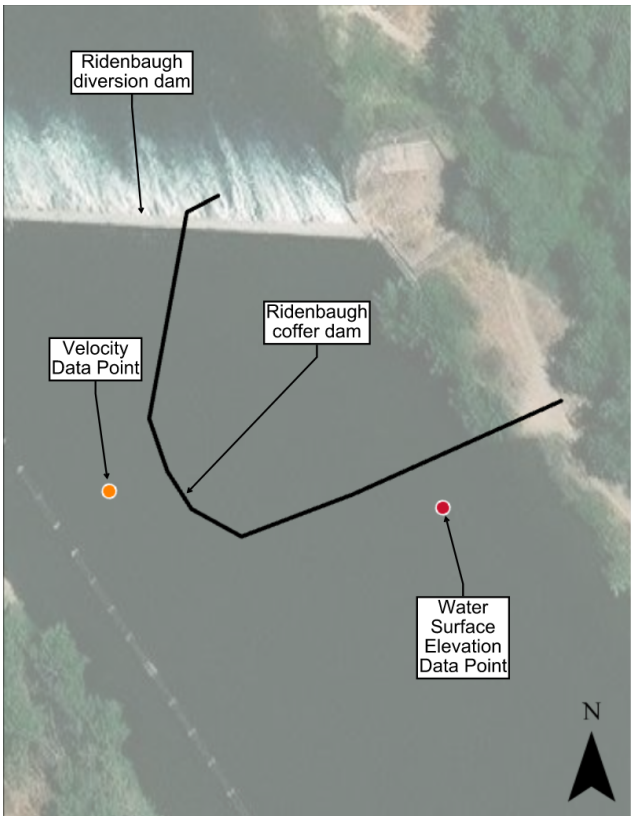

Figure 3: Data collection point locations.

Plots depicting stage-flow and velocity-flow relationships for the six scenarios were created from the collected data. These plots are included below as Figure 4, Figure 5, Figure 6, and Figure 7.

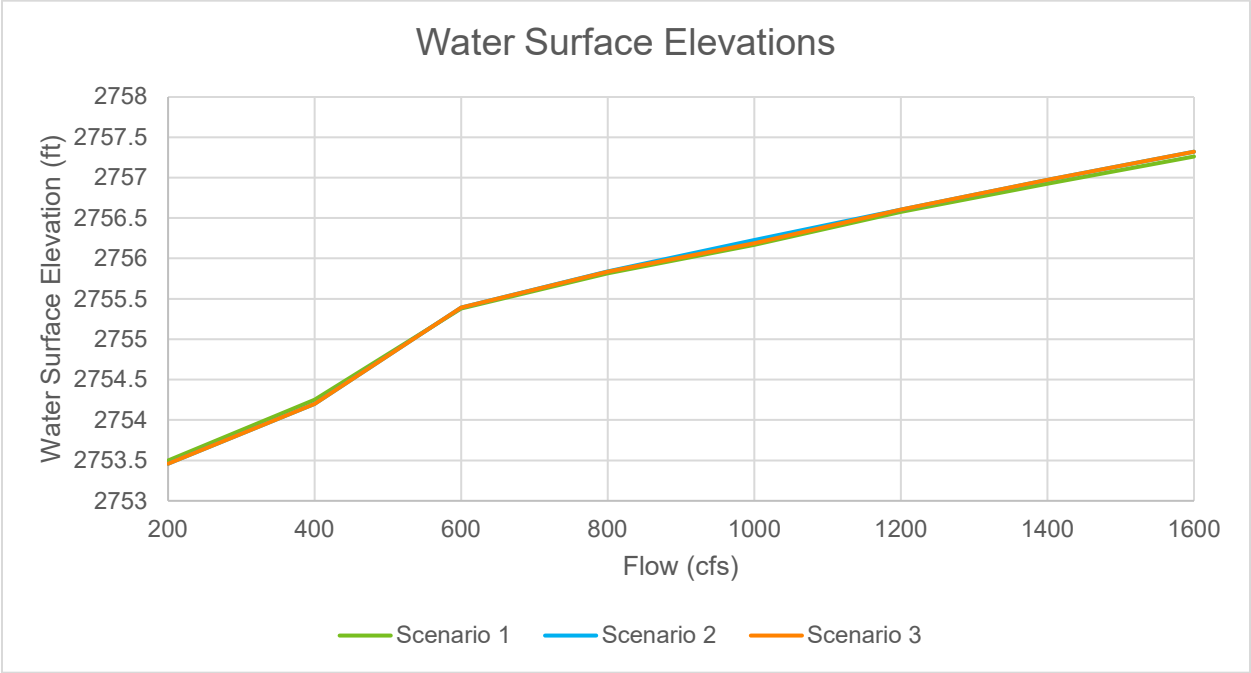

Figure 4. Water surface elevations comparison for scenarios 1, 2 and 3

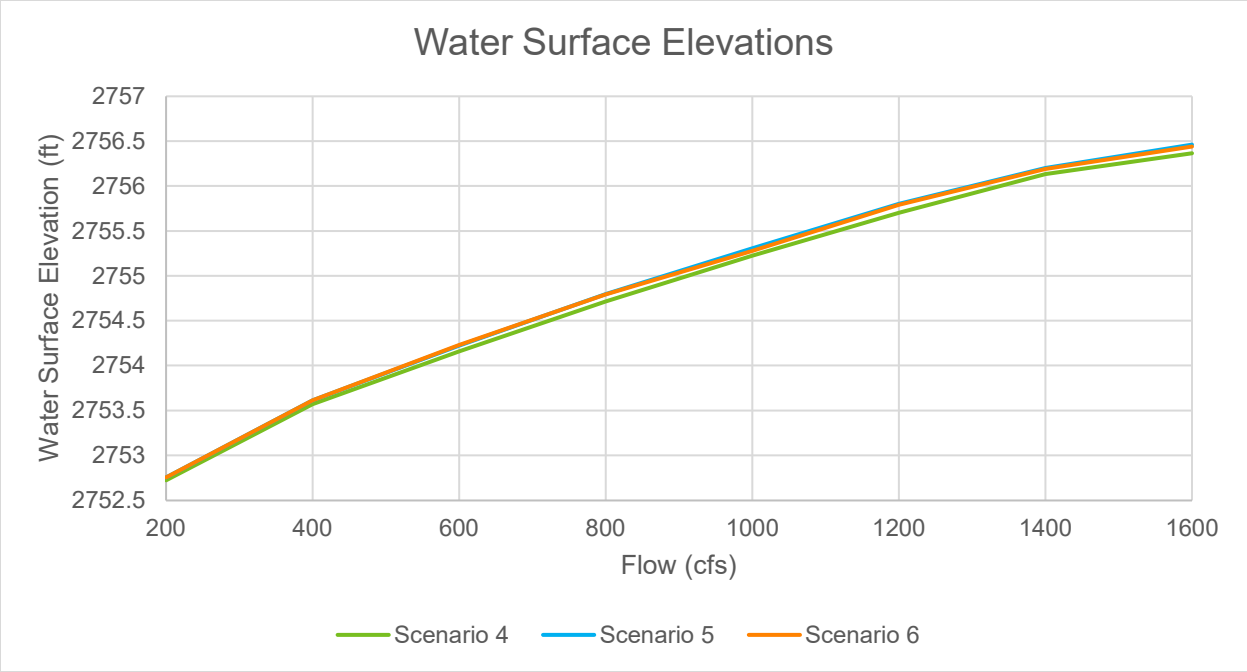

Figure 5. Water surface elevations comparison for scenarios 4, 5 and 6

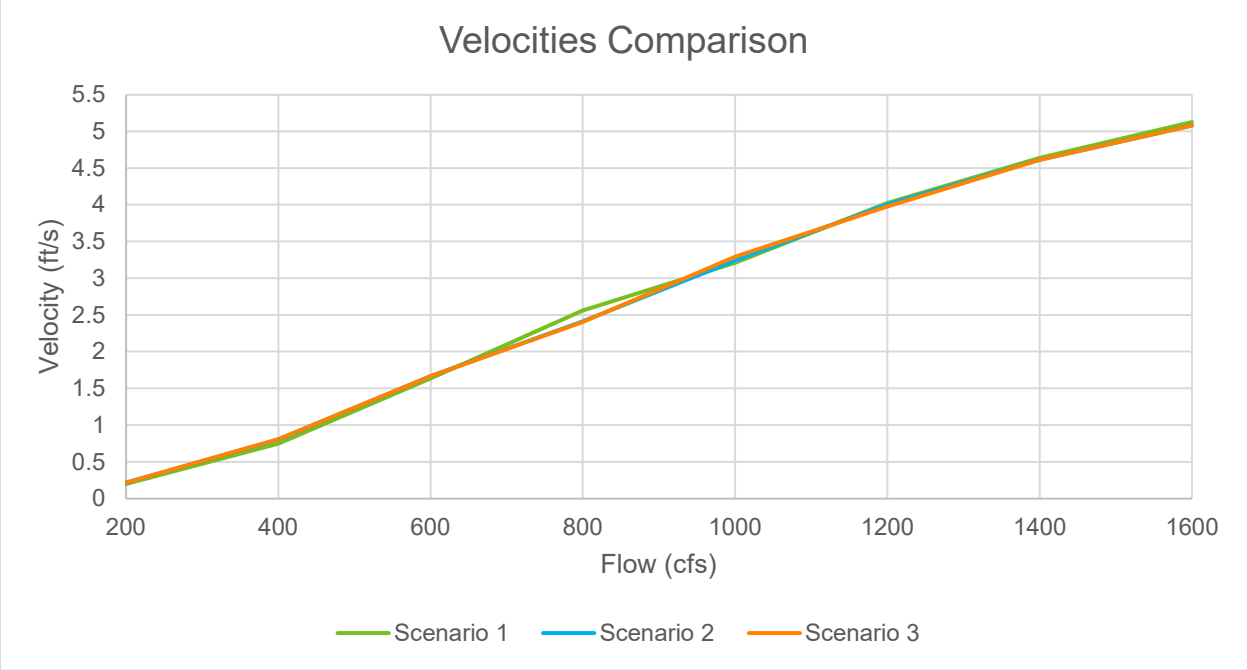

Figure 6. Velocities comparison for scenarios 1, 2 and 3

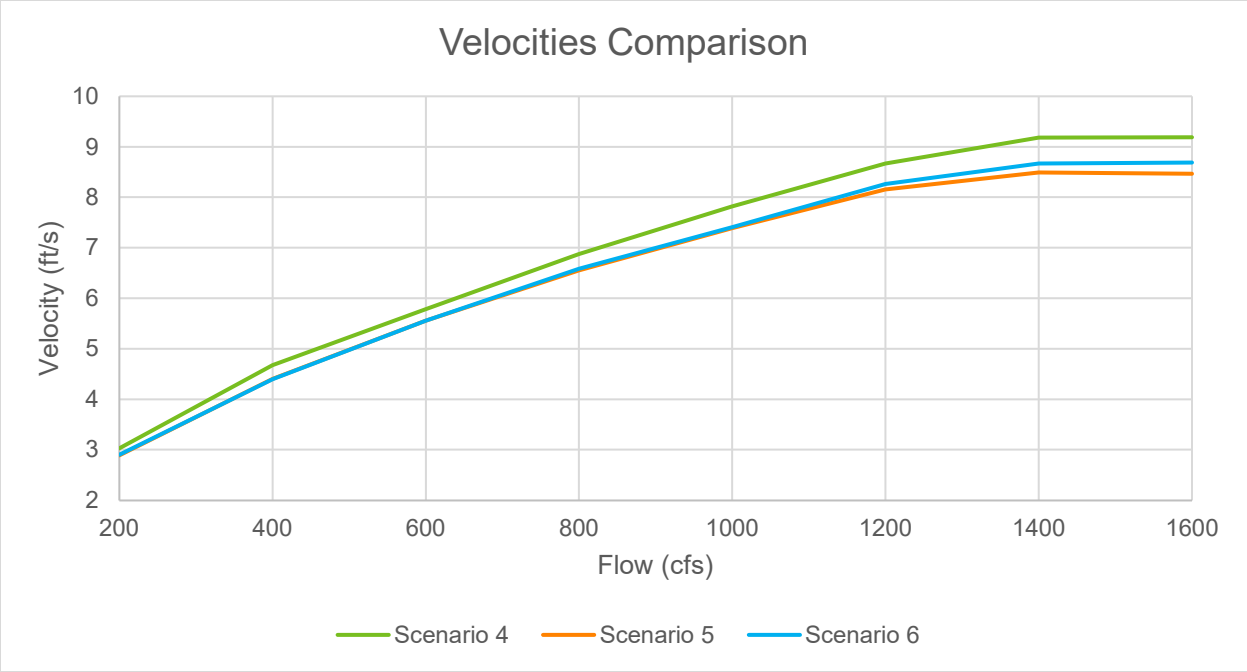

Figure 7. Velocities comparison for scenario 4, 5 and 6

Conclusions

As shown in Figure 4, Figure 5, Figure 6, and Figure 7, the difference between the baseline (Scenario 1 and Scenario 4) installation of just the Ridenbaugh coffer dam and the results of the west (Scenario 2 and 5) and east (Scenario 3 and 6) Eckert Road coffer dam installations are very small. The change in water surface elevation was typically less than 0.1 ft throughout the range of flows simulated. The difference in velocity was typically less than 0.1 ft/s throughout the range of flows simulated for scenarios with the stop logs included at the diversion dam.

With the stop logs removed and no water diversion into the Ridenbaugh canal in Scenario 5 and 6, the measured velocities were reduced from the baseline scenario by up to 0.7 ft/sec. The change in water surface elevation was still less than 0.1 ft throughout the range of flows simulated.

In both scenarios with stoplogs placed and active diversion into the Ridenbaugh canal, and without those conditions, the overall effect of the Eckert Road bridge coffer dams appears minor. It can be concluded that neither Eckert Road bridge coffer dam installation will substantially impact the hydraulic conditions at the Ridenbaugh coffer dam. If a larger coffer dam is installed, this analysis should be updated.