

I. Project Title: Tusher Wash Fish Barrier

II. Bureau of Reclamation Agreement Number(s): N/A

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IV. Abstract:

The Tusher Wash Diversion Dam, located on the Green River above Green River, UT, diverts water for multiple water users, including into the Green River Canal Company & Thayn Hydropower. Entrainment of native fish has been documented in the Green River Canal under multiple studies. This project consists of constructing a fish entrainment solution in the Green River Canal Company Main Canal to minimize entrainment of fish. The current concept for this facility consists of constructing a concrete weir wall in the canal, with appropriate fish return facilities. An electrical fish barrier in conjunction with the weir wall is also being considered. With this facility in place water entering the canal would flow over the top of the weir. The weir wall would be designed so that the depth of water flowing over the wall would be approximately 0.5 feet. The remainder of the water column in front of the weir wall would be returned to the Green River, along with any fish and debris in the water column below the top of the weir wall, via a newly constructed pipeline. A similar weir wall has been constructed in the Hogback Canal which diverts water from the San Juan River in northwest New Mexico. Operation of this facility is currently being monitored to determine its effectiveness prior to finalizing designs for the Tusher Wash facility.

V. Study Schedule:

This project has been deferred for a number of years, initially due to water right litigation between the Green River Canal Company and Thayn Hydropower which was ultimately resolved in the Utah Supreme Court. Additionally, the State of Utah and the Green River Canal Company have been evaluating the feasibility of rehabilitating the diversion dam to address needed repairs and improve operations. In FY 2012 a partnership was developed between the many local water users, the State of Utah and the NRCS to design, permit, and construct the diversion dam rehabilitation. A Final ROD and EIS were completed in 2015. Construction of the dam rehabilitation is planned for 2016. Prior to the development of the current concept to construct a weir wall in lieu of a fixed plate fish screen, final design of this facility could not be completed in advance of a final design for the dam rehabilitation. However, the weir wall can be designed and constructed independent of the dam rehabilitation. Therefore the only remaining prerequisite to designing and constructing the Tusher Wash weir wall is determining the effectiveness of the Hogback weir wall. An initial study was completed in November 2014, using

hatchery reared fish. Monitoring of real world conditions was delayed in 2015 due to electrical interference with the PIT tag readers caused by the pumping plant VFDs. Therefore the earliest construction start for the Tusher Wash facility is fall of 2016 (but likely not until spring 2017), assuming a positive determination of the effectiveness of the Hogback facility.

VI. Relationship to RIPRAP: Green River Action Plan: Mainstem II.B.2 Screen Tusher Wash diversion to prevent endangered fish entrainment.

VII. Accomplishment of FY 2015 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Upper Colorado Recovery Program Director's Office, FWS and Reclamation staff participated in the Environmental Impact Statement process conducted by the NRCS. During this process, Reclamation assisted by reviewing engineering layouts of fish passage and offering expertise gained from previous Program projects. FWS finalized a biological opinion for the project.

Smith Root, Inc. was contracted to develop and evaluate electrical fish barrier alternatives. Based on a review of other electrical fish barrier installations it is believed that this technology is not effective at preventing the downstream movement and entrainment of fish in canal systems as a standalone facility. At this stage in the decision making process an electrical fish barrier would only be considered in conjunction with the weir wall if the Hogback facility does not perform at an acceptable level.

Conceptual designs for the Tusher Wash weir wall were prepared along with the development of a draft O&M contract between the Green River Canal Company and the United States. As discussed above, final design of this facility and execution of the O&M contract are pending the results of the Hogback monitoring work.

VIII. Additional noteworthy observations: None

IX. Recommendations:

- Continue to conduct a monitoring program at the Hogback fish weir to determine its effectiveness. If the effectiveness of this facility is determined to be acceptable, proceed with final design and construction of the Tusher Wash weir wall. If the Hogback weir wall performance is found to be unacceptable, work with Smith Root Inc. to design and construct an integrated electrical fish barrier at the Hogback weir wall. Monitor and test this facility to determine if the concept merits further consideration at Tusher Wash.
- Continue to monitor fish entrainment at the Green River Canal as part of Recovery Program project C28a. Entrainment levels determined under project C28a will be used to determine the effectiveness of any entrainment solution developed under this project.
- Based on high levels of native fish entrainment seen in the Green River Canal in 2013 and 2014, perform canal salvage in the Green River Canal until the final entrainment solution is implemented. Consider continuing canal salvage for a few years after the entrainment solution to monitor effectiveness of the solution.

X. Project Status: The earliest possible completion date for installation of a facility to

minimize the entrainment of native fish has been delayed to at least March 2017 based on recently discovered information.

XI. FY 2015 Budget Status

- A. Funds Provided: \$0
- B. Funds Expended: \$90,545
- C. Difference: (\$90,545)
- D. Percent of the FY 2015 work completed, and projected costs to complete: NA
- E. Recovery Program funds spent for publication charges: \$0

XII. Status of Data Submission (Where applicable): NA

XIII. Signed: Brent Uilenberg November 04,2015
Principal Investigator Date