

To: Faranhyll Ranch HOA

12/4/2023

RE: Summary Report: Doose Ditch Headgate & Pipeline Repair

During the period mid-October through mid-November 2023, the Faranhyll Ranch Homeowners Association (HOA) completed needed repairs to its Doose Ditch headgate and ditch system. The HOA is responsible for the irrigation and cutting of 80 acres of high quality hay and pasture land on the ranch and much of the irrigation water supply originates from the Doose Ditch, a historic irrigation ditch that diverts water from Fourmile Creek, tributary to the Roaring Fork River in Garfield County. The following provides a brief description of the completed work.

Pre-existing Conditions. Over the last several years, the HOA has experienced repeated disruption in its ability to deliver irrigation water to its pastures due to significant Beaver activity, including multiple dam creations, at and near the Doose Ditch head gate. The dams and resulting high water table cause inundation of the upper 80 feet of open ditch located between the head gate and ditch's Parshall measuring flume. The open ditch segment is necessary to create a stabilizing flow entering the flume. Once through the flume, the water enters a 15 inch diameter pipeline for conveyance to the ranch. The beaver induced inundation is damaging the upper open ditch segment and causes repeated displacement of the measuring flume. It also creates an inability to control unwanted water from entering the down ditch pipeline inlet. Due to these adverse conditions, the HOA devised a mitigation plan that would reduce the impacts associated with the ongoing beaver activity and regain the efficient utilization of the Doose Ditch for irrigation of the ranch.

Doose Ditch Improvements. To mitigate the adverse conditions caused by the on-going beaver activity, the HOA completed the following tasks during the period October and November 2023.

1. The adjacent beaver ponds were temporarily drained in order to lower the water table in proximity to the project site. Lowering the water table was necessary to facilitate the headgate and ditch improvements. Dewatering the ponds became an on-going task for the HOA contractor as the beavers rebuilt their dams and/or plugged the inlet to the temporary drain pipes on a nightly basis. **Photograph 1** shows the drain pipes that were installed to allow pond lowering.
2. Once the groundwater elevation was lowered, the contractor accessed the site with construction equipment. The ditch's Parshall flume was removed and transported to a location on the ditch below the upper piped section (**Photograph 2**). The flume will be reset in the spring 2024 in consultation with the Division 5 Engineer.¹
3. Approximately 80 feet of existing pipeline and/or open ditch near the headgate was improved as highlighted below.
 - 20 feet of pipe that had become exposed due to flood flows and beaver activity were recovered with native soils.
 - Approximately 60+ feet of open ditch was replaced with a buried 15 inch diameter pipe. With these improvements, the entire upper section now flows within a buried pipe. The buried should help mitigate the expected continuing high water tables and inundation caused by the sites robust beaver community. These improvements are shown in **Photographs 3 and 4**.

¹ Approval to relocate the flume to a position lower on the ditch was approved by the Division 5 Engineer and local water commissioner (Heather Ramsey).

4. The contractor removed one of the beaver dams that had been constructed across Fourmile in proximity to the Doose Ditch headgate. The dam was large and effectively encased the ditch's entire concrete and metal diversion structure. Upon removal of the debris, it was discovered that multiple large rocks in Fourmile Creek that effectively directed water to the headgate had been displaced downstream by the force of high spring runoff experienced in 2023. At the direction of the HOA, the rock structures were rebuilt. **Photographs 5 through 8** show pre and post Fourmile Creek conditions of the headgate diversion system.

Project Costs. The Doose Ditch and Headgate and Pipeline Repair project was completed by Streamside Excavation and Reclamation with labor assistance provided by Refugio Curiel (Cuco). The project costs totaled **\$13,227.42** as summarized below.

Streamside Excavation and Reclamation: **\$10,894.42** paid by HOA Check No. 1018.

Cuco: **\$2,333.0** paid by HOA Check Nos. 1016 (\$823.50) and 1017 (\$1,509.50).

Photograph 1. Temporary drainage pipes placed in beaver dam.



Note temporary drainage pipes placed low in the beaver dam for drainage purposes. This dewatering helped lower the ground water table at the construction site.

Photograph 2. Parshall flume is removed from ditch.



The Ditch's Parshall flume was removed and the resulting open section of the ditch was piped. The flume will be repositioned down ditch in spring 2024.



Photograph 3. Pipeline Construction, Doose Ditch, November 6, 2023.

Photograph 4. Pipeline construction, complete, November 15, 2023.



Photograph 5. Fourmile Creek diversion rocks displaced downstream during 2023 runoff.



Photograph 6. Diversion system reconstruction, November 11, 2023.



Photograph 7. Reconstructed diversion system, Fourmile Creek, November 13, 2023.



Photograph 8. Reconstructed diversion system, Fourmile Creek, November 13, 2023.

