
DATE: February 2, 2022

TO: CCBWQA Manager

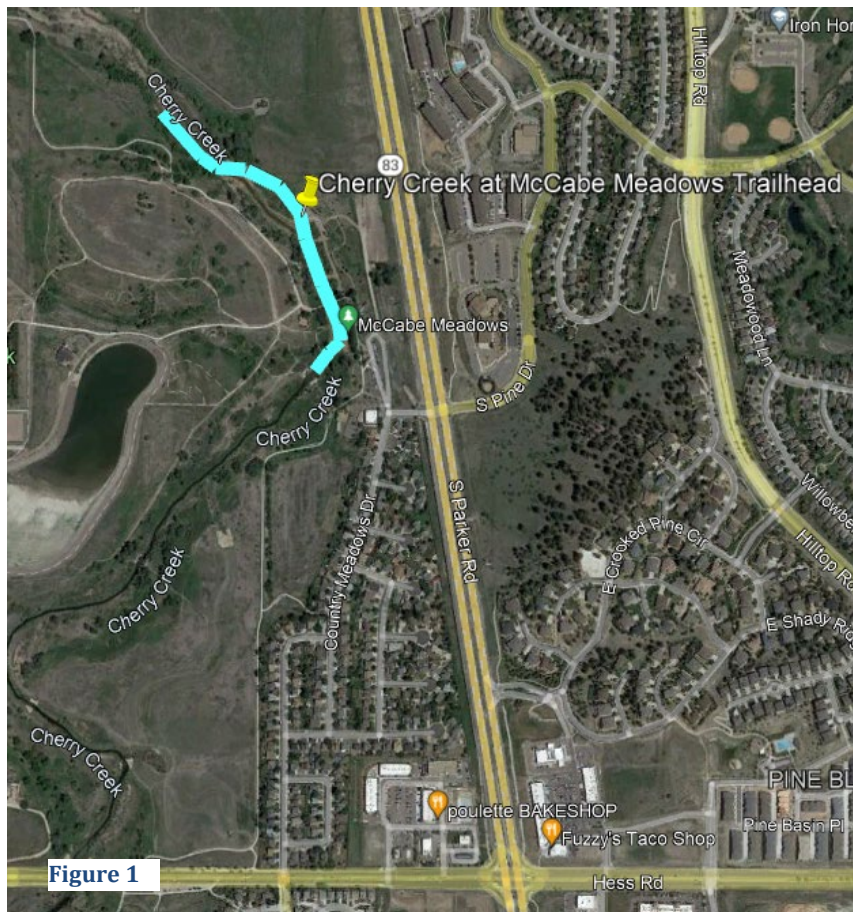
CC: Jacob James, CCBWQA TAC Chairman

FROM: Richard Borchardt, PE & CFM

SUBJECT: Cherry Creek at McCabe Meadows Trailhead Stream Reclamation Project Summary

Background and Purpose:

In 2017, the Town of Parker (Parker), Mile High Flood District (MHFD) and the Cherry Creek Basin Water Quality Authority (CCBWQA) began work on Cherry Creek at the McCabe Meadows Trailhead (aka KOA) which is located downstream of Hess Road and about 9.9 miles upstream of Cherry Creek Reservoir. The location Cherry Creek at McCabe Meadows Trailhead Stream Reclamation Project (Project) is shown in the Cyan line in **Figure 1**.



Cherry Creek at McCabe Meadows Trailhead Stream Reclamation

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Existing Conditions:

Urbanization the watershed upstream of the project resulting in increased rate, frequency, and magnitude of storm flows in Cherry Creek. Historically, the stream was a multithread channel that frequently migrated laterally. With the urbanization continues within the stream is now a single thread stream with a perennial base flow, and wide riparian floodplain benches. The project reach has 2 to 4 feet of downcutting within the stream bed resulting in steep eroded banks. Although wetland and riparian vegetation exists; it is distressed due to the lowering of the groundwater table corresponding to the lower incised stream profile (see **Photos 1-3**).

Design Approach:

The goal of the design was to create a healthy stream that is well connected to the adjacent vegetation while promoting the natural and beneficial functions of filtration and infiltration to improve water quality. Muller Engineering Company (MEC) selected as the design consultant in the Summer 2020. MEC proposed a stream planform that combines natural stream features with engineered bed and bank protection. This approach created a multi-stage stream section that provides for sediment transport from base flows through minor flood stages (i.e. 2-year recurrence interval) and conveys the larger storms (i.e. 2-year recurrence interval). This stream reclamation approach minimizes long-term maintenance and provides an environmentally sound and sustainable practice. MEC designed the Project using a combination of grade control (Boulder Cascade and Riffle Drop Structures), bank protection (Void Filled Riprap and Vegetation), and grading to create overbanks and reduce erosion potential. The Project includes stream reclamation of approximately 2,000 Linear Feet of Cherry Creek.



Photo 1



Photo 2



Photo 3

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Construction:

Construction was started on the Project in November 2020 and was completed in Summer of 2021 by Concrete Express Inc. (CEI). **Photos 4-6** show the constructed stream reclamation. **Photo 5** highlights one of the riffle drop structures installed and **Photo 6** shows a water quality pond installed for a small tributary on the east bank, which treats runoff from the trailhead parking lot and gazebo area.

Funding:

Parker, MHFD, and CCBWQA are partners on the Project. The cost sharing is 44.5% Parker, 37.1% MHFD, and 18.4% CCBWQA. The project cost is \$1,560,000 with \$287,000 being CCBWQA's share.

Water Quality Benefits:

The Project includes stream reclamation which provides water quality benefits for the stream and ultimately Cherry Creek Reservoir¹. Stream reclamation reduces erosion and immobilizes nutrients (including phosphorus and nitrogen) in the soils, reducing the nutrient concentrations in the water. The Project immobilizes an estimated 34 pounds of Phosphorus per year². The water quality pond (**Photo 6**) on the west tributary provides additional water quality treatment above the estimate 34 pounds of Phosphorus.



Photo 4



Photo 5



Photo 6

¹ CCBWQA Stream Reclamation, Water Quality Benefit Evaluation – Interim Status Report; CCBWQA Technical Advisory Committee; June 16, 2011.

² CCBWQA 2020 Capital Improvement Program Supporting Data, Board Adopted Version November 21, 2019.

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Summary:

Water Quality Benefit of reduction of \approx 34 pounds of Phosphorus per year

Total Project Cost = \$1,560,000

Authority's Share = \$287,000

Engineer: Muller Engineering Company

Contractor: Concrete Express, Inc.

Additional information for the Cherry Creek at the McCabe Meadows Trailhead (aka KOA) can be found at the project sponsors websites below.

Parker website link: <https://www.parkeronline.org/205/Capital-Improvements>

MHFD website link: <https://mhfd.org/resources/mapping/>

CCBWQA website link: <https://www.cherrycreekbasin.org/library/>