

DATE: February 8, 2023

TO: Jane Clary, Wright Water Engineers, CCBWQA Technical Manager

CC: Jon Erickson, CCBWQA Technical Advisory Committee Chairman

FROM: Richard Borchardt, PE & CFM

SUBJECT: East Boat Ramp Shoreline Stabilization Phase 2 - Project Summary

Background and Purpose:

The 2018 Annual Inspection of Pollution Reduction Facilities (PRFs) noted, “...that an area of shoreline adjacent to the boat ramp and previous shoreline is unraveling and threatening adjacent infrastructure and trees.”¹ The East Boat Ramp Phase 2 Shoreline Stabilization Project (EBR P2 Project) is located on the east side of the reservoir (see **Figure 1**). In the Shoreline PRF Design Approach at Cherry Creek Reservoir² Ruzzo states, “Erosion is primarily the result of wave and ice forces acting on the shoreline soils, but also from pedestrian and domestic animal uses that destroy vegetation exposing bare soils that are more readily eroded” and “Shoreline stabilization projects qualify as a PRF because they minimize the quantity of soil, with attached phosphorus and other pollutants, eroded along the edge of the reservoir that become deposited directly into the lake.” The purpose of the EBR P2 Project is to stabilize the shoreline and reduce the soil, phosphorus, and other pollutants entering the reservoir.



Figure 1

¹ 2018 Annual Inspection of PRF’s at Cherry Creek State Park; JRS Engineering Consultant, LLC; July 18, 2018

² Shoreline PRF Design Approach at Cherry Creek Reservoir Memorandum; William P. Ruzzo, PE, LLC; November 11, 2013

Existing Conditions:

The shoreline was eroded for 105 Linear Feet; **Photos 1-2** from the 2018 Annual Inspection of PRFs³ show the existing conditions.



Photo 1



Photo 2

³ 2018 Annual Inspection of PRF's at Cherry Creek State Park; JRS Engineering Consultant, LLC; July 18, 2018

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Design Approach:

The EBR P2 Project used riprap supplemented with willow stakes and void filled riprap overlain with topsoil, grass seed, straw mulch, and coir mat to stabilize the shoreline.

Construction:

The EBR P2 Project was constructed from August to November 2022 by 53 Corporation, LLC. **Photos 3-4** show the project under construction. **Photo 5** shows the constructed improvements; native grasses are anticipated to grow, filling in the brown coir mat (top of photo), and willows are anticipated to grow, filling in the grey riprap (bottom of photo).



Photo 3



Photo 4

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R2R Engineers Memorandum



Funding:

CCBWQA funded the EBR P2 Project at a total cost of \$91,000.

Water Quality Benefits:

The EBR P2 Project includes shoreline stabilization that provides water quality benefits for Cherry Creek Reservoir. Shoreline stabilization reduces erosion and immobilizes nutrients (including phosphorus and nitrogen) in the soils, reducing the nutrient concentrations in the water. The EBR P2 Project immobilizes an estimated 12 pounds of phosphorus per year.⁴

Summary:

Water Quality Benefit of reduction of \approx 12 pounds of phosphorus per year

Total Project Cost = \$91,000

Authority's Share = \$91,000

Engineer: R2R Engineers

Contractor: 53 Corporation

Additional information for the EBR P2 Project can be found at the project sponsor websites below.

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

⁴ CCBWQA 2022 Capital Improvement Program Supporting Data, Board Adopted Version November 18, 2021.