



**Cherry Creek Basin Water Quality Authority  
Technical Advisory Committee Meeting Agenda  
Thursday, February 2, 2023, 9:00 a.m.**

**In-Person: SEMSWA  
7437 S. Fairplay St.  
Centennial, CO 80112**

**Virtual: Zoom<sup>1</sup>  
<https://zoom.us/j/3039689098> Passcode: CCBWQA  
Phone (669)900-6833 Mtg ID 3039689098# Passcode: 542117**

**TAC Meeting Documents can be found online at the link below.**

**<https://drive.google.com/drive/folders/12BoEhmFbnnMCxivnpjY2l7T5TzP8Azlq?usp=sharing>**

1. Call to Order/Opening Remarks (Erickson) (9:00)
  - a. Jessica La Pierre - City of Aurora, Introductions
  - b. Caitlin Gappa - Douglas County Health Department, Introductions
  - c. Brad Robenstein - Douglas County, TAC Alternate for Ryan Adrian, Introductions
  - d. Gene Seagle - US Army Corps of Engineers, Introductions
2. Meeting Minutes from January 5, 2023 (enclosed)
3. Highlights from January 19, 2023 Board Meeting (Clary)
4. Action Items (9:10)(30 minutes)
  - a. Acceptance of Project Summary Reports (Borchardt, enclosed)
    - i. East Boat Ramp Shoreline Stabilization Phase 2
    - ii. Cherry Creek Stream Reclamation at 12-mile Park Phase 3
    - iii. McMurdo Gulch 2022 Stream Reclamation
  - b. RDS Operations and Maintenance for 2023 (Goncalves, enclosed)
5. Discussion Items (9:40) (30 minutes)
  - a. Initial Watershed Plan Update (Clary)
  - b. Potential Topics for Subcommittees (Clary)
    - i. MS4 (Retained)
    - ii. Watershed Plan
    - iii. Models
    - iv. Pollution Abatement Projects
  - c. Lake Nutrients Criteria RMH (DiToro)
6. Presentations (10:10)
  - a. Water Quality Standards 101 (DiToro) 10-15 minutes
7. Updates (10:25)
  - a. Cherry Creek Stewardship Partners (Davenhill)
  - b. TAC Members
  - c. TAC Subcommittees
  - d. Contractors
    - i. [Water Quality Update](#) (Stewart)
    - ii. Pollution Abatement Projects (Borchardt/Goncalves)
      - a. CIP Status Report
      - b. Maintenance and Operations Status Report
    - iii. Regulatory (DiToro)
    - iv. [LUR Tracking](#) (Endyk)
  - e. Manager

<sup>1</sup> If you are unable to participate on the CCBWQA's Zoom platform, please email [val.endyk@ccbwwa.org](mailto:val.endyk@ccbwwa.org)

- f. Other
- 8. Upcoming Events
  - a. New Member Orientation - February 16, 2023 - 11:00 am - 12:30 pm
  - b. Cherry Creek in CCSP Muller Report and BMP Effectiveness Workshop - March 16, 2023 8:30-11:30 am
  - c. Watershed Plan Process - September 21, 2023 - 8:30-11:30 am
- 9. Adjournment (*11:00*)



**Cherry Creek Basin Water Quality Authority  
Minutes of the Technical Advisory Committee  
Thursday, January 5, 2023, 9:00 a.m.**

**TAC Members Present**

Alex Mestdagh, Town of Parker  
Ashley Byerley, SEMSWA  
Casey Davenhill, Board Appointee, Cherry Creek Stewardship Partners  
David Van Dellen, Town of Castle Rock (zoom)  
Jacob James, City of Lone Tree (zoom)  
Jeremiah Unger, CDOT (zoom)  
Joseph Marencik, City of Castle Pines (zoom)  
Jon Erickson, TAC Chair, Board Appointee, Colorado Parks and Wildlife  
Rebecca Tejada, Board Appointee, Special Districts, Parker Water and Sanitation District  
Rick Goncalves, Board Appointee (zoom)  
Ryan Adrian, Douglas County (zoom)  
Wanda DeVargas, Board Appointee, E-470 (zoom)

**Board Members Present**

Bill Ruzzo, Governor's Appointee (zoom)  
Tom Downing, Governor's Appointee (zoom)  
Tom Stahl, City of Greenwood Village (zoom)

**Others Present**

Chris Holdren, LRE Water  
Erin Stewart, LRE Water  
James Linden, SEMSWA (zoom)  
Jane Clary, Wright Water Engineers, CCBWQA Technical Manager  
Jessica DiToro, LRE Water  
Larry Butterfield, CPW (zoom)  
Steve Chevalier, Arapahoe County Health Department (zoom)  
Val Endyk, CCBWQA

**1. Call to Order/Opening Remarks**

Jon Erickson called the meeting to order at 9:00 am and moved the agenda item 5b to Action Items.

**2. Approve Meeting Minutes from December 1, 2022**

David VanDellen moved to approve the December 1, 2022 meeting minutes. Seconded by Jacob James. The motion carried.

**3. Highlights from December 15, 2022 Board Meeting**

Jane Clary provided an update on actions taken at the December 15, 2022 board meeting and that all generally board actions followed TAC recommendations. The only other discussion was that CCSP will still be able to

provide the CCBWQA Water Quality sticker to continue to provide CCBWQA revenue with the implementation of the new Colorado Wild State Park passes.

#### 4. Action Items

##### a. 2022 RDS Operations Report

On behalf of Rich Borchardt, Jane Clary presented the [2022 RDS Annual Report](#) providing highlights of operations and maintenance of the reservoir destratification system and recommendations regarding future compressor cleanings and maintenance currently contracted through Ingersoll Rand. Rich's memo can be found [here](#). The 2023 budget includes \$65,000 for Utilities, \$11,000 for Service Plan (PackageCare), and \$47,700 for Maintenance of the RDS.

Discussion included:

- Recommendation to prepare a report that documents the benefits associated with the operation of the CCR RDS system which include topics such as water quality benefits, frequency of algae blooms, anecdotal benefits to fishery/recreation, etc. and report back at a future TAC meeting.
- Suggestion for a summary document about the RDS that can be provided for new TAC/Board members. This led to a broader discussion about a folder of "policy statements" that could be stored in a Google Drive folder accessible to TAC/Board members without having to go back through individual meeting packets and reports. (Note: the current RDS policy is included in Appendix A of the [2022 RDS Annual Report](#).)
- Rick Goncalves will assume management of the RDS operations in 2023. The transition from Rich to Rick is going smoothly.

Jacob James moved to accept the 2022 RDS Operations and Maintenance Report. Seconded by Rick Goncalves. The motion carried.

##### b. Dove Creek Stream Reclamation IGA Amendment

On behalf of Rich Borchardt, Jane Clary presented the Dove Creek Stream Reclamation Improvements from Otero Avenue to Pond D1 IGA explaining that the design is nearing completion and RESPEC is the design engineer. The first phase of construction between Otero Avenue and Chambers Road is scheduled for early 2023 and the IGA Amendment brings in 2023 funding of \$1,700,000 (\$138,000 CCBWQA and \$1,562,000 SEMSWA) for the construction of the first phase and contingency. The project is currently estimated at \$2,100,000 in the IGA. Rich's memo including photos of the project can be found [here](#). The draft IGA can be found [here](#).

Alex Mestdagh moved to recommend that the Board approve an Intergovernmental Agreement (IGA Amendment) with SEMSWA for the first phase of construction of the Dove Creek Stream Reclamation. Seconded by Casey Davenhill. The motion carried.

##### c. Lake Nutrients RMH moved from Discussion to Action Items

Jessica DiToro discussed information from the [Action Item Memo](#) and requested the TAC recommend the CCBWQA Board of Directors approve the Lake Nutrients Criteria Rulemaking Hearing Rebuttal Statement framework [draft](#). Background information and the Lakes Nutrients Criteria RMH Schedule and CCBWQA Meeting Schedule are included. Next steps include continuing to engage with the WQCD, CPW, EPA, and other parties, as appropriate. At the January 19<sup>th</sup> CCBWQA Board meeting, staff will present the draft Rebuttal for the Board to vote on. If the Board approves the associated motion, Davis Graham and Stubbs will submit the Rebuttal by February 15<sup>th</sup>. If the Board does not approve the associated motion, Staff will work to address the Board's concerns with the Rebuttal and bring the updated Rebuttal to the TAC on February 2<sup>nd</sup>. Staff will then work with the Regulation 38 Rulemaking Hearing Subcommittee to finalize the Rebuttal for submission.

Ashley Byerley moved that the CCBWQA TAC recommends that the CCBWQA Board of Directors approve the Lake Nutrients Criteria Rulemaking Hearing Rebuttal Statement, as drafted by Staff, based on the Regulation 38 Rulemaking Hearing Board Subcommittee's direction on December 28, 2022. Seconded by David VanDellen. The motion carried.



**d. CR72 Informational Hearing Letter**

Jessica DiToro provided an action item memo requesting the TAC to recommend that the CCBWQA Board of Directors approve the attached letter to the Water Quality Control Commission. Background information and the attached letter can be found in the attached [memo](#).

Casey Davenhill moved that the CCBWQA TAC recommends that the CCBWQA Board of Directors prepare a letter, a draft of which is [attached](#), to the Water Quality Control Commission. Seconded by Rick Goncalves. The motion carried.

**5. Discussion Items**

**a. Workshops for 2023**

- i. **Cherry Creek in CCSP Muller Report and BMP Effectiveness Workshop - March 16, 2023 8:30-11:30 am**
- ii. **Watershed Plan Process - September 21, 2023 8:30-11:30 am**

Jane Clary informed the TAC of the planned 2023 workshop dates and topics.

**b. Land Use Referral Contacts**

Jane Clary updated the TAC on the Authority's efforts to communicate the Land Use Referral Process change effective January 1, 2023. The [letter](#) sent to local agencies notifying them of the change has been posted to the CCBWQA's website and emailed to various parties as noted in the spreadsheet found [here](#). Val Endyk is updating the spreadsheet as local agencies respond, confirming their receipt of the letter and understanding of the new land use review process.

**6. Presentations**

**a. WY 2022 Monitoring Report**

Erin Stewart provided a presentation on the [WY 2022 Water Quality Monitoring Report](#).

The one-hour presentation provided a summary of findings based on data collected over water year 2022 including precipitation, flow, water quality and biological monitoring. The draft report including detailed analysis will be provided to the TAC and Board later in January.

**b. Water Quality Standards 101 - Moved to February**

**7. Updates**

**a. Cherry Creek Stewardship Partners**

Casey Davenhill provided an update on the [Cherry Creek Stewardship Partners events](#).

- Annual Hawk Walk
- Science fair coming up and details will be posted on the website soon

**b. TAC Members**

Jon Erickson noted that the water level in Cherry Creek Reservoir is lower than ever (approaching critical levels), with reservoir filling restricted by relatively junior water rights. CPW is looking at options to purchase water and potential funding partners for this purpose.

**c. TAC Subcommittees**

**d. Contractors**

- i. [Water Quality Update](#)
- ii. **Pollution Abatement Projects**
  - a. [CIP Status Report](#)
  - b. **Maintenance and Operations Status Report**
- iii. **Regulatory**
- iv. [LUR Summary](#)

**e. Manager**

The CCBWQA still needs a contact for Douglas County Health Department for representation on the TAC.

**f. Other**

**8. Upcoming Events**

**9. Adjournment**

Jon Erickson adjourned the meeting at 11:02 am.



## ACTION ITEM MEMORANDUM

**To:** CCBWQA Technical Advisory Committee (TAC)  
**From:** Richard Borchardt, Pollution Abatement Project Manager  
**Date:** February 2, 2023  
**Subject:** Project Summaries for East Boat Ramp Shoreline Stabilization Phase 2, Cherry Creek Stream Reclamation at 12-mile Park Phase 3, and McMurdo Gulch 2022 Stream Reclamation

**Request:** The TAC reviews and accepts the project summaries for the East Boat Ramp Shoreline Stabilization Phase 2, Cherry Creek Stream Reclamation at 12-mile Park Phase 3, and McMurdo Gulch 2022 Stream Reclamation projects.

**Project/Issue:** CCBWQA completed the East Boat Ramp Shoreline Stabilization Phase 2, Cherry Creek Stream Reclamation at 12-mile Park Phase 3, and McMurdo Gulch 2022 Stream Reclamation projects in 2022. The attached project summaries describe the background, purpose, existing conditions, design approach, construction, funding, and water quality benefits of each project. After the TAC reviews, any comments and revisions will be included in the draft that goes to CCBWQA's Board. Once CCBWQA's TAC and Board accept the project summaries, they will be included in CCBWQA's 2022 Annual Report.

**Budget:** N/A

**Motion:** **I move to accept the project summaries (option – with the associated comments and revisions from TAC) for the East Boat Ramp Shoreline Stabilization Phase 2, Cherry Creek Stream Reclamation at 12-mile Park Phase 3, and McMurdo Gulch 2022 Stream Reclamation projects.**

**DATE:** January 27, 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 - **DRAFT**

**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.”<sup>1</sup> 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 Reservoir<sup>2</sup> 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**

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

<sup>2</sup> 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 PRFs<sup>3</sup> show the existing conditions.



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



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R2R Engineers Memorandum

**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.<sup>4</sup>

**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/>

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



**DATE:** January 27, 2023

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

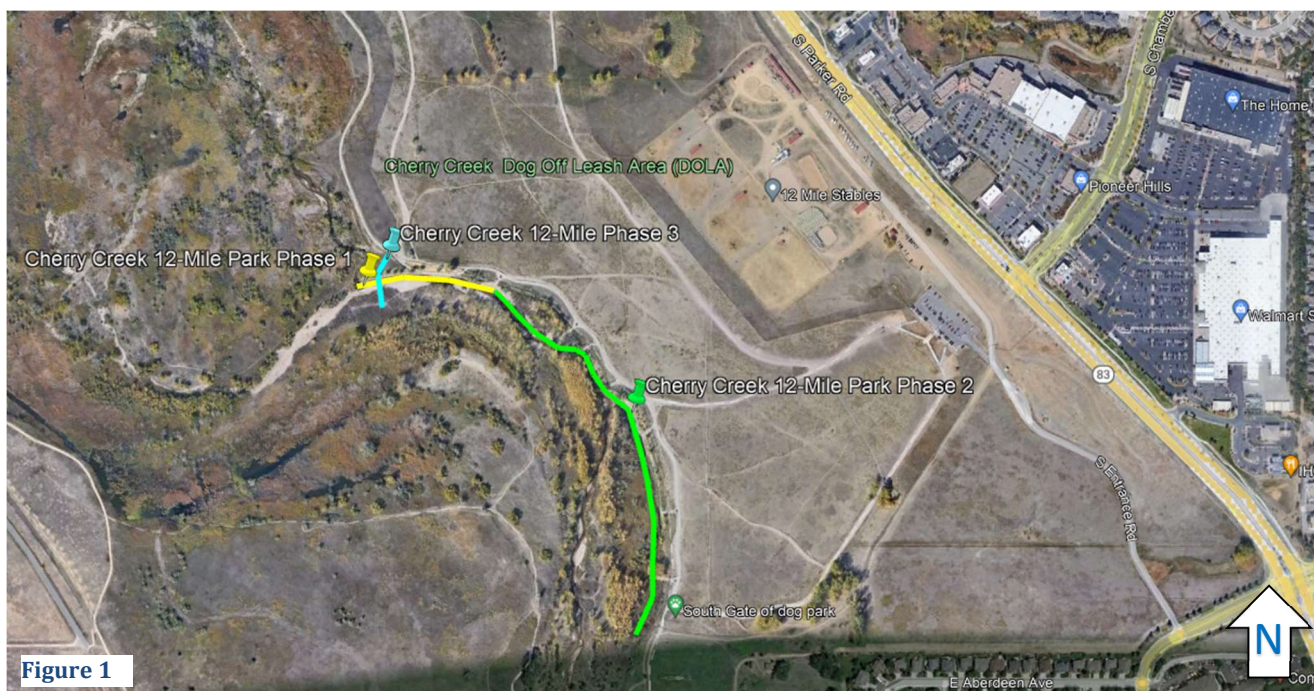
**CC:** Jon Erickson, CCBWQA Technical Advisory Committee Chairman

**FROM:** Richard Borchardt, PE & CFM

**SUBJECT:** Cherry Creek Stream Reclamation at 12-mile Park Phase 3 - Project Summary - **DRAFT**

**Background and Purpose:**

In June 2012, the Cherry Creek Basin Water Quality Authority (CCBWQA) completed the first phase of the Cherry Creek Stream Reclamation at 12-mile Park (Phase 1).<sup>1</sup> In June 2014, CCBWQA completed the second phase of the Cherry Creek Stream Reclamation at 12-mile Park (Phase 2).<sup>2</sup> In 2015, sediment began to deposit within the Phase 1 reach. In 2017, a breach occurred downstream of Phase 1. In November 2018, CCBWQA hired CH2M Hill Engineers, a subsidiary of Jacobs Engineering Group (Jacobs/ch2m), to provide alternative analysis and ultimately design of the third phase of Cherry Creek Stream Reclamation at 12-mile Park (Phase 3). **Figure 1** shows the location of Phases 1 to 3.



**Figure 1**

<sup>1</sup> Cherry Creek Stream Reclamation @ 12-Mile Park Phase I – Project Summary; William P. Ruzzo, PE, LLC; January 28, 2013

<sup>2</sup> Cherry Creek Stream Reclamation @ 12-Mile Park Phase II – Project Summary; JRS Engineering Consultant, LLC; October 21, 2014



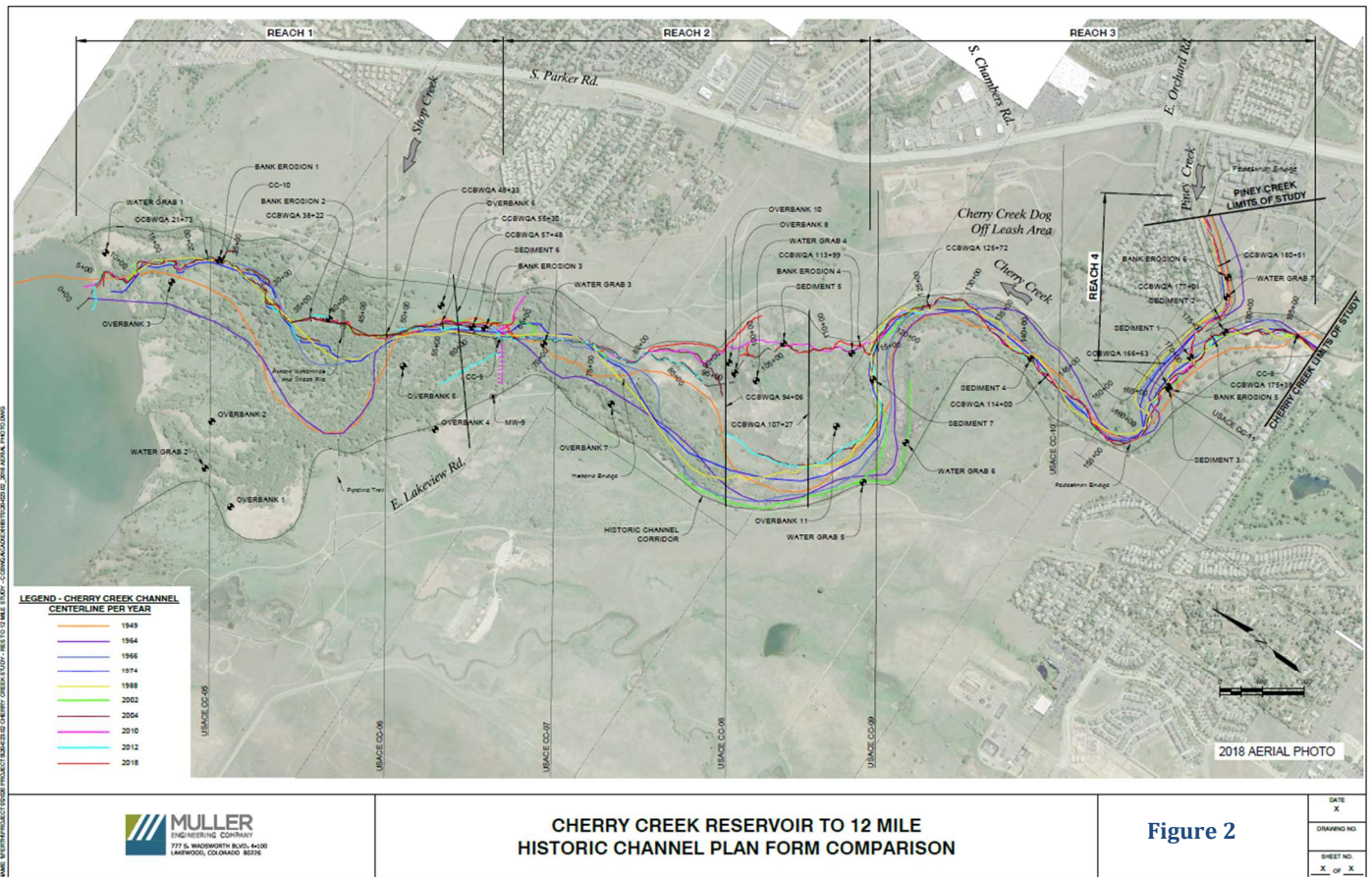
Cherry Creek at 12-mile Park Phase 3 Stream Reclamation Project Summary - **DRAFT**

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R2R Engineers Memorandum

The urbanization in the watershed upstream of the Cherry Creek State Park (CCSP) results in increased rate, frequency, and magnitude of storm flows in Cherry Creek which in turn contribute to the complex and dynamic nature of Cherry Creek in CCSP. In June 2020, CCBWQA hired Muller Engineering Company (MEC) to take a broader look at Cherry and Piney Creeks within Cherry Creek State Park. MEC included in their Report<sup>3</sup> the historic channel plan **Figure 2** which highlights the existing condition and nature of Cherry Creek within CCSP.



The primary purpose of Phase 3 was to protect the infrastructure installed upstream in Phases 1 and 2. Phase 3 includes a grade control structure which serves to help protect the upstream infrastructure of Phases 1 and 2 with the associated water quality benefit and about 30 feet of bank protection which provides an additional water quality benefit.

<sup>3</sup> Cherry Creek Stream and Water Quality Assessment Reservoir to State Park Boundary; Muller Engineering; November 2022



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R2R Engineers Memorandum

**Existing Conditions:**

Cherry Creek in the breach area previously flowed towards top right of **Photo 1**, compared with the current flow path which is towards the bottom right in **Photo 1**. There is approximately a 2-foot head cut at the existing boulder edging (see middle of **Photo 1**) which has been displaced, and the riprap installed below the boulder edging has moved downstream (see right side of **Photo 1**). Upstream of the breach area, near the concrete access trail, the water surface is at the bottom of the boulders (**Photo 2**); if the head cut continues to move upstream, this will likely undercut additional boulder edging thereby threatening additional infrastructure.



Photo 1, 6/1/22

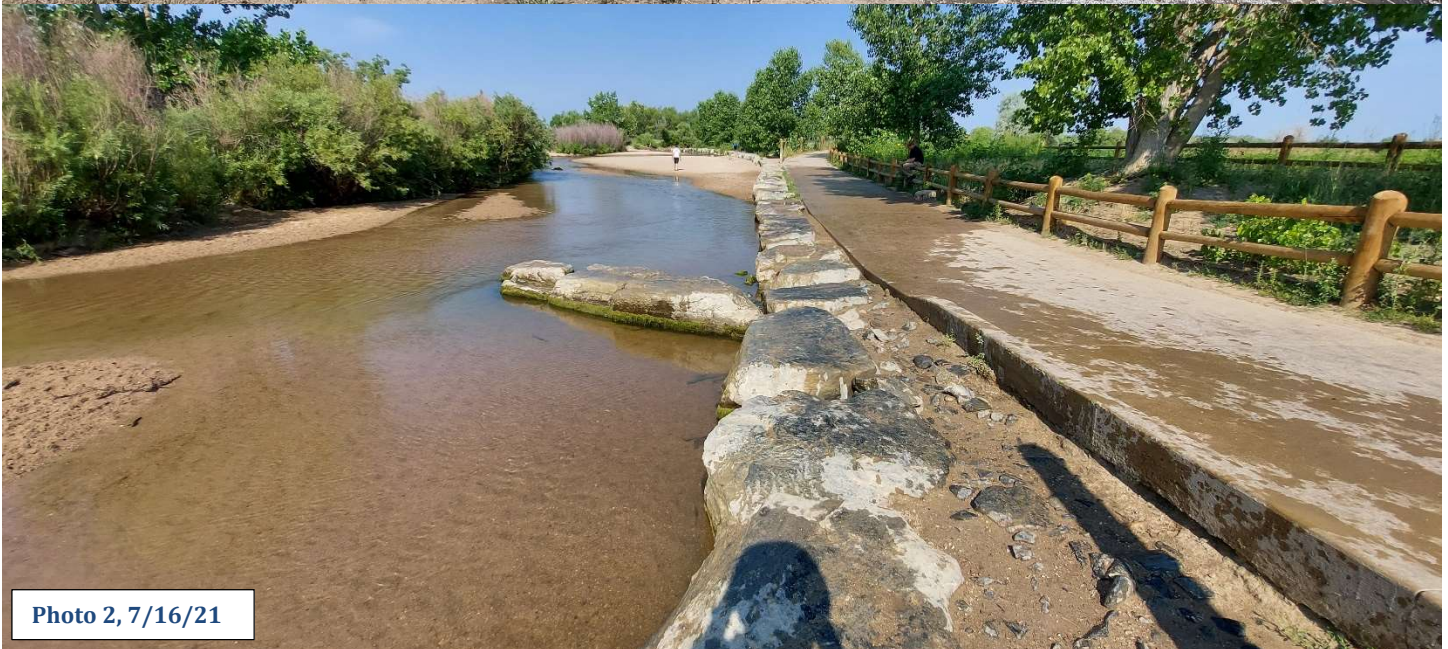


Photo 2, 7/16/21



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R2R Engineers Memorandum

Although wetland and riparian vegetation exist, it is stressed due to the lowering of the groundwater table, corresponding to the lower stream level. Trees and willows in the project area were not budding out (**Photo 3**) when other trees and willows just upstream were budding out (**Photo 4**).



Photo 3, 5/4/22



Photo 4, 5/4/22



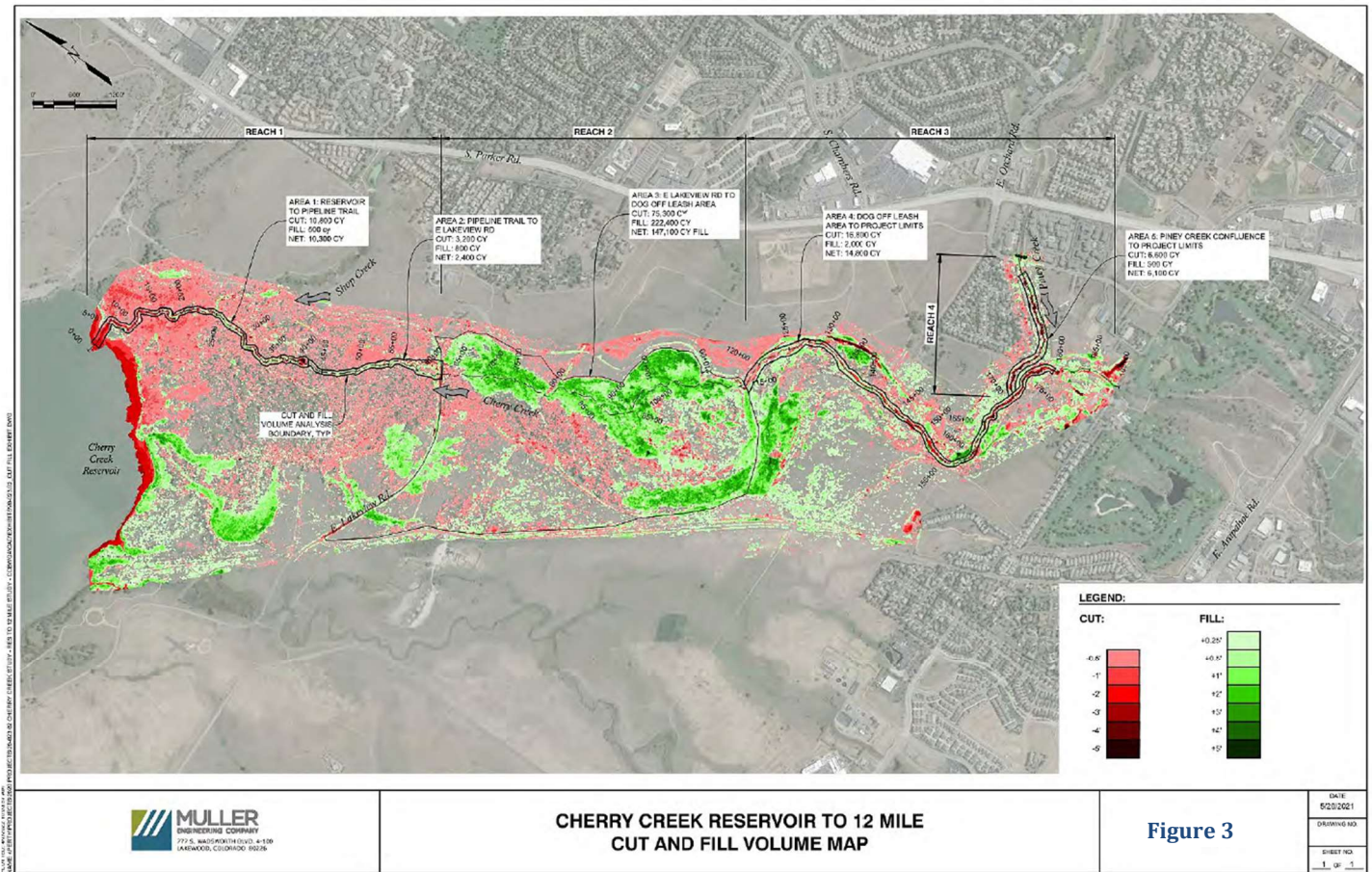
January 27, 2023

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R2R Engineers Memorandum

**Design Approach:**

Due to the complex and dynamic nature of Cherry Creek in CCSP, CCBWQA set up a design review committee<sup>4</sup> to navigate the opportunities and constraints of Phase 3. In MEC's report, it was noted that there is a valley floor alluvial fan downstream of the breach area that serves as a natural depositional area (**Figure 3**). This depositional area allows sediment and other nutrients to settle out; thus, improving the water quality in Cherry Creek.



Jacobs/ch2m and MEC coordinated with the final location of the control structure which was placed at the upstream apex of the valley floor alluvial fan to allow for the stream to take its natural courses over time and allow for the continued natural and beneficial uses of the valley floor alluvial fan and wetlands. The project includes a sheet-pile grade control structure with riprap to reduce bed erosion and help protect the infrastructure installed upstream in Phases 1 and 2 and about 30 feet of bank protection which provides an additional water quality benefit. The design review committee evaluated many options, worked through several difficult constraints, and brought together the recommendations of two different consulting teams determining that Phase 3 should protect the upstream infrastructure, maintain the current flow path of the

<sup>4</sup> The design review committee consisted of David Van Dellen, Jacob James, Casey Davenport, Bahman Hatami/Jon Erickson, and Richard Borchardt.



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R2R Engineers Memorandum

breach, and provide enough flexibility to allow for future movement of the stream downstream of the control structure.

**Construction:**

Construction of Phase 3 occurred from May to June 2022 and was performed by 53 Corporation. Phase 3 constructed stream stabilization measures that include about 30 feet of bank protection (Photo 5) and a sheet-pile grade control structure with riprap (Photo 6).

**Funding:**

CCBWQA funded the Phase 3 project at a total cost of \$443,000.

**Water Quality Benefits:**

Phase 3 stream stabilization helps to maintain the existing water quality benefit of Phases 1 and 2, and it provides an additional water quality benefit from the bank protection. Phase 3 reduces erosion and immobilizes nutrients (including phosphorus and nitrogen) in the soils, reducing nutrient loading to Cherry Creek and Cherry Creek Reservoir.<sup>5</sup> Phase 3 immobilizes an estimated 1 pound of phosphorus per year.<sup>6</sup>



Photo 5, 6/14/22



Photo 6, 6/14/22

<sup>5</sup> CCBWQA Stream Reclamation, Water Quality Benefit Evaluation – Interim Status Report; CCBWQA Technical Advisory Committee; June 16, 2011.

<sup>6</sup> CCBWQA 2022 Capital Improvement Program Supporting Data, Board Adopted Version November 18, 2021.

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R2R Engineers Memorandum

**Summary:**

**Helps to Maintain Water Quality Benefit of Phases 1 and 2  $\approx$  52 pounds of phosphorus per year<sup>7</sup>**

**New Water Quality Benefit of reduction of  $\approx$  1 pounds of phosphorus per year**

**Total Project Cost = \$443,000**

**Authority's Share = \$443,000**

**Engineer: Jacobs/ch2m**

**Contractor: 53 Corporation**

Additional information for the third phase of Cherry Creek Stream Reclamation at 12-mile Park (Phase 3) can be found at the project sponsors websites below.

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

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<sup>7</sup> Table 1 of CCBWQA 2022 Capital Improvement Program Supporting Data, Board Adopted Version November 18, 2021 shows a water quality benefit of 9 pounds for Cherry Creek 12-mile Park Phase I and 43 pounds for Cherry Creek 12-mile Park Phase II of phosphorus immobilized annually.



**DATE:** January 27, 2023

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

**CC:** Jon Erickson, CCBWQA Technical Advisory Committee Chairman

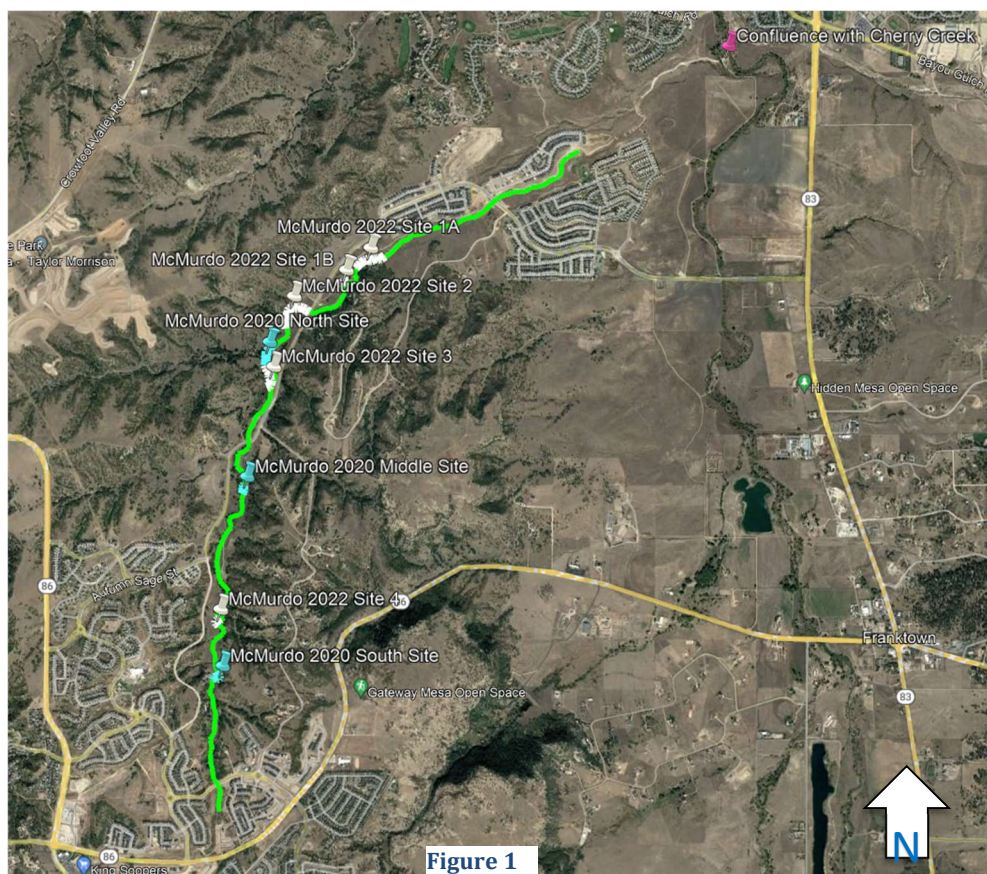
**FROM:** Richard Borchardt, PE & CFM

**SUBJECT:** McMurdo Gulch – 2022 Stream Reclamation Project Summary - **DRAFT**

**Background and Purpose:**

McMurdo Gulch is a western tributary to Cherry Creek that is 6.7 miles long and has a watershed area of 6.5 square miles. The McMurdo Gulch 2022 Stream Reclamation Project (2022 Project) continues the partnership between the Town of Castle Rock (Castle Rock) and Cherry Creek Basin Water Quality Authority (CCBWQA) on McMurdo Gulch, which began with 2011 Project<sup>1</sup> and the 2020 Project.<sup>2</sup> **Figure 1** shows the location of the 2022 Project (see white sites) and the 2020 Project (see cyan sites).

An Adaptive Management Approach (AMA) is used on McMurdo Gulch: as development occurs, stream changes and degradation are monitored, and the stream is reclaimed as needed. Castle Rock monitors and assesses McMurdo Gulch to determine the scope and schedule of stream reclamation needed to



**Figure 1**

<sup>1</sup> McMurdo Gulch Stream Reclamation – Project Summary; William P. Ruzzo, PE, LLC; November 16, 2011.

<sup>2</sup> McMurdo Gulch - 2020 Stream Reclamation Project Summary; R2R Engineers; February 2, 2022.





Photo 1, Site 2



Photo 2, Site 3



Photo 3, Site 4

improve the stability, natural and beneficial functions, and improve water quality of the stream. In November 2016, Muller Engineering Company (MEC) prepared the 2016 McMurdo Gulch Reach Assessment (MGRA).<sup>3</sup> MEC started their monitoring and assessment at the upstream end of McMurdo Gulch and continued downstream approximately 4.9 miles (see green line in **Figure 1**).

**Existing Conditions:**

From the 2016 MGRA, “The average gradient through the studied reach varies between 1.3% and 2.0%. Evidence of erosion was observed in many locations along the length of the channel. Head cuts, incision, and areas of instability were recorded. In addition, the level of instability and potential for future adverse impacts from the upstream watershed were noted and included in the assessment. Channel reaches in good condition were also noted so that they can be used as reference reaches for restoring stability to degraded reaches.” The MGRA informed the first 3 priorities. The 2020 Project was the first priority and the 2022 Project is the second priority in the MGRA and includes 5 reaches labeled starting at the north end with 1A, 1B, 2, 3, and ending with 4 at the south end. **Photos 1-3** show the existing conditions of the 2022 sites.

**Design Approach:**

McMurdo Gulch is changing with the development of the watershed, as can be seen through the bed and bank erosion in **Photos 1-3**. These changes seem relatively mild; however, through the adaptive management approach provides the right project at the

<sup>3</sup> 2016 McMurdo Gulch Reach Assessment; Muller Engineering Company; November 3, 2016.



right time. MEC designed the 2022 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 2022 Project includes stream reclamation of approximately 3,700 Linear Feet of McMurdo Gulch.

**Construction:**

The 2022 Project was constructed from February to November 2022 by Tezak Heavy Equipment. **Photos 4-6** show the constructed improvements for the 2022 Project sites.

**Funding:**

Castle Rock and CCBWQA are partners on the 2022 Project. The cost sharing is 75% Castle Rock and 25% CCBWQA. The project cost is \$1,926,000 with \$482,000 being CCBWQA’s share.

**Water Quality Benefits:**

The 2022 Project includes stream reclamation which provides water quality benefits for the stream and ultimately Cherry Creek Reservoir.<sup>4</sup> Stream reclamation reduces erosion and immobilizes nutrients (including phosphorus and nitrogen) in the soils, reducing nutrient loading to McMurdo Gulch and Cherry Creek Reservoir. Ruzzo states, “Load and concentration reductions during base and storm flow conditions can occur by reducing flow velocities, providing greater areas for filtration and infiltration of stormwater and, to some extent, through increases in dissolved oxygen”.<sup>5</sup> The 2022 Project immobilizes an estimated 63 pounds of phosphorus per year.<sup>6</sup>



Photo 4, Site 1A



Photo 5, Site 2



Photo 6, Site 3

<sup>4</sup> CCBWQA Stream Reclamation, Water Quality Benefit Evaluation – Interim Status Report; CCBWQA Technical Advisory Committee; June 16, 2011.

<sup>5</sup> McMurdo Gulch Stream Reclamation – Project Summary; William P. Ruzzo, PE, LLC; November 16, 2011

<sup>6</sup> CCBWQA 2022 Capital Improvement Program Supporting Data, Board Adopted Version November 18, 2021.

McMurdo Gulch – 2020 Stream Reclamation

January 27, 2023 - DRAFT

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R2R Engineers Memorandum

**Summary:**

**Water Quality Benefit of reduction of ≈ 63 pounds of phosphorus per year**

**Total Project Cost = \$1,926,000**

**Authority's Share = \$482,000**

**Engineer: Muller Engineering Company**

**Contractor: Tezak Heavy Equipment**

Additional information for the McMurdo Gulch – 2022 Stream Reclamation Project can be found at the project sponsor websites below.

Castle Rock website link: <https://crgov.com/1698/Stormwater>

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



## ACTION ITEM MEMORANDUM

To: CCBWQA Technical Advisory Committee  
From: Rick Goncalves, RDS & PRF Maintenance Manager  
Date: January 26, 2023  
Subject: 2022 Reservoir Destratification System (RDS): Operations & Maintenance Annual Report Followup

**Request:** Recommendation to the Board to Implement 2023 Annual Report Recommendations  
**Project:** The 2022 Annual Report highlights the year of Operations & Maintenance for the RDS and makes the following recommendations:

1. The compressor coolers were cleaned on June 14, 2022; however, the compressor had a temperature warning and shutdown on September 2, 2022. For this reason, it is recommended to have Ingersoll Rand (IR) clean compressor coolers at a frequency of about every 2 months during the operating season to minimize the chances of another high temperature shutdown like what happened from September 2-7, 2022. This cleaning can be requested by contacting IR's Technician Supervisor, currently Daniel Ortiz at [DOrtiz@irco.com](mailto:DOrtiz@irco.com) or on his mobile phone 303.598.7069.
2. Since there was a delay in knowing that the compressor wasn't running (CCBWQA had to wait until the after the holiday weekend to be contacted by IR of a potential issue), it is recommended that CCBWQA evaluate options to improve communication with IR and consider other options to monitor RDS operations to minimize the length of future lengths shutdowns.
  - IR was contacted to start this evaluation, and they are beta testing providing their Remote Monitoring System (RMS) to their customers. The RMS provides e-mail and notifications and an online platform to IR that identifies maintenance needs of the compressor. The RMS beta test would be included in CCBWQA's PackageCare so there wouldn't be any additional cost; a request to add CCBWQA has been made to IR's Account Manager, currently Jeff Handley at [Jeff.Handley@irco.com](mailto:Jeff.Handley@irco.com) or on his mobile phone 303.345.4407). If CCBWQA notices an issue through the RMS or site visit, then a call can be placed to 1-800-223-1911 option 1 to IR to request maintenance on the compressor. The standard work hours are Monday through Friday 7:30 am to 4:00 pm (Mountain Time); if maintenance is needed outside of those hours, a recorded message gives instructions for a 24-hour call service that will reach out to the on-call technician. Maintenance during standard work hours is covered under CCBWQA's PackageCare plan, but after-hours work is not covered and is charged at an hourly rate with a 4-hour minimum.
  - If the RMS doesn't meet the information and communication needs of CCBWQA, CCBWQA can look at possibly reviving the previous notification system (SCADA and Mission Control software used with the old compressor)

or a new one that provides a call out to a list (consultant staff and manager) and remote monitoring/control option. This option would likely need further evaluation to determine the scope of work and identification of costs.

3. Since there was an 8.8% increase in energy consumption from 2021 to 2022, it is recommended to continue monitoring the annual energy consumption and look for any trends that may point to developing issues or concerns.

**TAC Review:** TAC reviewed and accepted the 2022 RDS Operations & Maintenance Report at its January 2023 meeting.

**Budget:** The budget requirements are not exactly known at this time, but the costs to implement these recommendations are expected to be minimal and be able to fall within the contingencies for the 2023 RDS budget, which is \$123,700 (\$65,000 for Utilities, \$11,000 for PackageCare Service Plan, and \$47,700 for Maintenance).

**Supporting Reports:** 2023 RDS Annual Report

**Suggested Motion:** **Motion to recommend to the Board that the recommendations made in the 2022 RDS Annual Report be implemented.**

**Next Steps:** Preparation of a Action Item Memorandum recommending the implementation described above.

**CHERRY CREEK BASIN WATER QUALITY AUTHORITY**  
**2023 Capital Project Status Report**  
January 27, 2023

**RESERVOIR PROJECTS**

1. East Shade Shelters Phase III and Tower Loop Phase II Shoreline Stabilization (CCB-17.5 and CCB-17.7)
  - a. Description: These projects were identified in 2014 through the annual inspection. The Tower Loop Phase II connects to the Phase I project and extends shoreline protection 570 feet to the southeast towards Dixon Grove. The East Shade Shelters Phase III starts on the north end of the Shade Structure and goes 400-feet to the south.
  - b. Status: Consultant selection is scheduled for the 1st quarter. A consultant selection committee will be set in February (1/29/21). At the February TAC meeting Jason Trujillo, Jon Erickson, Lanae Raymond, Bill Ruzzo were interested in serving on the consultant selection committee (2/11/21). This selection committee was discussed at the 3/18/21 Board Meeting, and no further members were added. The Request for Proposals (RFP) has been posted on BidNet and Proposals are due 04/21/21 (3/25/21). The pre-proposal meeting was held on 4/7/21. 5 proposals were received on 4/28/21; the selection committee is reviewing them. Interviews were held and a selection is being brought to the May Board meeting (5/14/21). Board authorized negotiations with RESPEC (5/27/21). Agreement has been executed with RESPEC (10/15/21). Field Survey of project areas and topographic mapping is underway (12/30/21). A design kickoff meeting was held on 4/22/22. A design sprint workshop was held on 7/12/22 which included a site visit and evaluation of alternatives. RESPEC is developing a recommended alternative (9/8/22). RESPEC provided updated project costs for budgeting (10/13/22). The 30% submittal was received on 11/16/22 and is under review. *CCBWQA provided comments on 30% review on 1/17/23; a value engineering effort is recommended as the project costs exceed the budget.*

**STREAM RECLAMATION PROJECTS**

1. Cherry Creek Stream Reclamation at Arapahoe Road aka Reaches 3 and 4 (CCB-5.14C)
  - a. Description: This project continues the work on Cherry Creek by CCBWQA, MHFD, and local partners. It ties into the previous stream reclamation projects of Cherry Creek Eco Park to Soccer Fields (CCB-5.14A) and Cherry Creek at Valley Country Club (CCB-5.14B). The 5,167 Linear Feet of stream reclamation reduces bed and bank erosion immobilizing approximately 88 pounds of phosphorus annually. The project is anticipated to be funded over several years and likely be broken into phases.
  - b. Status: In 2021, an IGA was executed between CCBWQA, MHFD, City of Aurora, and SEMSWA to begin this work. IGA Amendment that brings in 2022 funding is under review (5/13/22). Board authorized IGA Amendment for 2022 funding on 7/21/22 (8/12/22). IGA Amendment has been revised to show Aurora's lower participation; CCBWQA's participation was lowered accordingly to meet 25% partner project level; revised IGA Amendment received TAC recommendation and is being taken to Board for their consideration in October (10/13/22). Board authorized the IGA Amendment for 2022 funding at their 10/22/22 meeting.
2. Cherry Creek Stream Reclamation – Upstream of Scott Road (CCB-5.17)
  - a. Description: Design and construction of stream reclamation is in partnership with Douglas County and MHFD. It improves 4,100 feet of Cherry Creek and is located upstream of Scott Road.
  - b. Status: IGA was approved by the Board at their April 2020 meeting. Muller had been selected as consultant, and design scope of work is being prepared. Kickoff meeting was held on 12/11/20; a follow-up field visit will be scheduled for early 2021. Site visit was held on 1/29/21. Conceptual design is complete, negotiations are underway to contract for 60%



design (4/8/21). Muller is working on alternatives (4/30/21). Muller is working on preliminary design and an IGA Amendment to bring in additional 2021 funding from Douglas County is being brought to the Board in October (10/15/21); IGA Amendment has been executed (11/11/21). Muller is preparing 60% Design Submittal (1/28/22). Muller submitted 60% Design on 2/2/22; comments have been provided on 60% Design Submittal (3/10/22). IGA Amendment bringing in 2022 funding is scheduled for TAC and Board consideration in June (5/27/22). IGA Amendment was authorized at the June 16<sup>th</sup> Board Meeting (6/30/22).

3. Cherry Creek Stream Reclamation at Dransfeldt (CCB-5.17.1B)
  - a. Description: Design and construction of stream reclamation is in partnership with Town of Parker and MHFD. It improves 2,400 feet of Cherry Creek near the future location of Dransfeldt bridge which is just downstream of the Cherry Creek at KOA project.
  - b. Status: Initial scoping has begun, and a partners meeting was held on 1/30/21. IGA is scheduled for CCBWQA's May TAC and Board meetings (4/30/21). IGA was approved by all parties and has been executed (6/25/21). Muller Engineering has submitted their Draft Scope of Work for Design Services, and the project sponsors have reviewed it (7/8/21). Design kickoff meeting was held on 10/14/21. Alternatives are being evaluated (12/9/21). Pre-submittal meeting for the 404 permit is being scheduled (12/30/21). CLOMR is being prepared for project (3/10/22) and was submitted to FEMA on 3/31/22. CEI was selected for as project partner to provide contractor input during the design (5/27/22). CLOMR is under review by FEMA (8/12/22). *Muller has received comments on CLOMR and is preparing responses; 90% Submittal is scheduled for early February (1/27/23).*
4. McMurdo Gulch Priority 3 Stream Reclamation (CCB-7.2)
  - a. Description: The design and construction of stream reclamation is in partnership with Castle Rock. Castle Rock is the lead agency. This phase continues the work from the previous phase. Muller Engineering is the design consultant.
  - b. Status: Board authorized IGA for Priority 3 at their May 19,2022 meeting. Muller submitted their 30% deliverable on 10/31/22, review comments were returned on 11/8/22. Easements needed for projects have been identified (1/23/22).
5. Lone Tree Creek in Cherry Creek State Park (CCB-21.1)
  - a. Description: This project includes a trail connection to Cherry Creek State Park and includes 570 linear feet of stream reclamation on Lone Tree Creek from the State Park Boundary to the Windmill Creek Loop Trail. The City of Centennial is the project lead. CCBWQA participation is for the stream reclamation only.
  - b. Status: 95% submittal is under review (5/13/22); review comments have been returned (5/27/22). Project funding was brought to TAC at their 7/7/22 meeting, during drafting of IGA it was discovered that future maintenance of stream reclamation should be considered, project will be brought back to TAC at an upcoming meeting for maintenance discussion and recommendation (8/12/22). A stakeholder meeting was held on 9/29/22 to discuss maintenance. A stakeholder meeting was held on 11/2/22 to discuss findings from CCBWQA's site visit and findings included in Wright Water Engineers report. The Board supports CCBWQA's partnering with Centennial at their 11/17/22 meeting.
6. Happy Canyon Creek – County Line to Confluence with Cherry Creek (CCB-22.1)
  - a. Description: The design and construction are in partnership with Southeast Metro Stormwater Authority and MHFD and includes 2,500 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$325,000. The total project cost is estimated at \$1,300,000.
  - b. Status: IGA is scheduled for June TAC and Board meetings (5/27/21). IGA has been approved and executed by all parties (7/29/21). Jacobs has been selected as design consultant and project scoping is underway; limits have been extended upstream to the County Line and sediment capture area and transport will be included with the project (10/15/21). Jacobs has submitted their scope of work and fee for design which is under review by project sponsors (11/11/21). Project sponsors have completed a review of Jacobs'

fee and scope of work and the agreement is being routed for signatures (1/28/22). IGA Amendment to bring in 2022 funding is in process (3/10/22). A project kickoff meeting was held on 3/28/2022. A site visit was performed on 4/12/22 to document existing conditions and identify sediment source/transport/deposition areas. Project Team is preparing a sampling plan for bank and bed materials to determine phosphorous content (5/13/22). The project team met on 5/24/22 to discuss project goals and Jacobs is progressing through the study. Jacobs and ERC are working on sediment transport analysis and model (6/30/22). The results from the sediment transport model were presented at the 8/23/22 progress meeting and an upstream sediment capture area just south of the JWPP was included in the alternatives analysis (8/26/22). The alternative analysis report is expected to be completed before the end of 2022 (10/13/22). Lab results from stream soil samples were sent to Jacobs so that they include phosphorus reduction in the alternatives analysis report; a groundwater investigation is needed to inform sediment capture facility and stream reclamation alternatives, scoping and negotiations are in progress (11/11/22). Groundwater scope of work has been reviewed and approved by project sponsors (1/13/23).

7. Happy Canyon Creek - Upstream of I-25 (CCB-22.2)

- a. Description: The design and construction are in partnership with Douglas County, City of Lone Tree, and MHFD and includes 2,500 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$500,000. The total project cost is estimated at \$2,000,000.
- b. Status: Douglas County, City of Lone Tree, and MHFD have initially funded and selected Muller Engineering as the design engineer. Design has started and a progress meeting was held on 1/27/21. Design is progressing (2/11/21). Muller has submitted 60% Design Deliverables (5/27/21). IGA for 2021 Funding is being brought to Board in September (9/9/21). 2021 IGA Amendment has been executed (11/11/21). Coordination with CDOT and easement acquisitions are on-going (1/13/22). Board authorized 2022 funding and IGA Amendment at their June 16<sup>th</sup> meeting (6/30/22). The project received environmental clearance from CDOT (8/12/22). The 90% design submittal is scheduled for delivery by end of September (8/26/22). The 90% design submittal is being reviewed (10/13/22). Comments were provided on 90% submittal (11/11/22). Muller completed the 100% design submittal on 11/22/22. CDOT permit was issued, and pre-construction meeting was held on 1/10/23; construction start is scheduled for 1/30/23 pending execution of easement documents from Surrey Ridge which has agreed to terms and easement language. *Notice to Proceed on construction is pending execution of easement documents (1/27/23)*

8. Dove Creek - Otero to Chambers Rd. (CCB-23.1)

- a. Description: The design and construction are in partnership with Southeast Metro Stormwater Authority (SEMSWA) and with Mile High Flood District (MHFD) being a key stakeholder; it includes 1,300 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$175,000. The total project cost is estimated at \$700,000.
- b. Status: SEMSWA is drafting the Intergovernmental Agreement to bring in the 2021 funding for the project (3/12/21). RESPEC is the design consultant; two conceptual design alternatives have been prepared and reviewed during meeting on 3/15/21. IGA is scheduled for CCBWQA's May TAC and Board meetings (4/30/21). IGA has been approved and executed by all parties (7/29/21). 30% Design Review Meeting was held on 8/23/21. A Progress meeting is scheduled for 2/26/22 with 60% Plan submittal expected to follow (1/28/22). The 60% Design was submitted on 2/16/2022, comments were provided, and a design review meeting was held on 2/23/2022. IGA Amendment to bring in 2022 funding is in process (3/10/22). Construction costs were prepared by CEI based on 60% submittal (5/13/22). A design progress meeting was held 6/14/22 and 90% design submittal is being prepared (6/30/22). 90% design submittal is expected by the end of July (7/15/22). The 90% design submittal was reviewed, and comments were submitted on 8/22/22. *Construction is anticipated in 2023 (10/13/22)*. A progress meeting was held on 11/8/22, project will likely be done in 2 phases, IGA Amendment will be needed early in 2023 so that construction can start

ahead of storm season. Dove Creek IGA for construction of Phase 1 is scheduled for TAC and Board in January 2023, construction is expected to start shortly afterwards (12/30/22). *Construction is scheduled to start mid-February; construction agreement and engineering construction services amendment are currently being reviewed (1/27/23).*

- 9. Piney Creek from Fraser Street to Confluence with Cherry Creek aka Reaches 1 and 2 (CCB-21.1)**
  - a. Description: This project includes 2900 liner feet of stream reclamation on Piney Creek. The project partners are SEMSWA and CCBWQA.
  - b. Status: Project coordination meeting was held with SEMSWA on 6/29/22. IGA drafted and is being reviewed by SEMSWA (8/12/22). IGA was approved by CCBWQA at the 9/15/22 Board meeting.
  
- 10. Mountain and Lake Loop Shoreline Stabilization Phase II (OM 4.6)**
  - a. Description: This project was identified in through the 2020 annual inspection and design and permitting started in 2021. It adds about 40 feet of shoreline protection where it has eroded leaving a 1-2 foot tall vertical bank.
  - b. Status: Construction Plans have been prepared and the GESC was submitted to Arapahoe County for review (1/13/22). Plans are being reviewed by US Army Corps of Engineers for 408 clearance (5/13/22).



**CHERRY CREEK BASIN WATER QUALITY AUTHORITY**  
**2023 RDS and In-Park PRF Operations and Maintenance Report**  
**for**  
**February 2023**

**Prepared by:** Rick Goncalves

**Date:** 1/27/2023

**Reservoir Destratification System (OM-7)**

- Description:
  - Operations and Maintenance Activities of the Reservoir Destratification System (RDS).
- Status:
  - System currently in “Sleep Mode”.
  - Updates to O&M procedures in progress-needs Action Item Memorandum approval.
  - Waiting for April system checkout and commencement of fulltime operation on or about May 1.
  - A summary of water quality benefits of the RDS is in process.

**PRF Weed Control (OM 14.1)**

- Description:
  - Includes 2023 weed control from 2022 Annual Observation of Pollution Reduction Facilities (PRFs). For 2023, mechanical weed control is included on the recently completed projects of Cherry Creek 12-mile Phase 3 and East Boat Ramp Phase 2.
- Status:
  - No update.

**PRF Reseeding at CCSP (OM 14.2)**

- Description:
  - Includes 2023 routine restoration of PRF vegetation at Cherry Creek State Park (CCSP) from 2022 Annual Observation of Pollution Reduction Facilities (PRFs). For 2023, Cottonwood Creek at Peoria Pond reseeded includes the decompaction of topsoil, seeding, and mulching of the access road along the embankment.
- Status:
  - No update.

**Shop Creek Maintenance (OM WHPP)**

- Description:
  - Includes concrete repair and tree removal on drop structure 3 (of the 5 drop structures within CCSP numbered 1 through 5 from upstream to downstream) and control of vegetation growing on the faces of the drop structures
- Status:
  - No update.