



**Cherry Creek Basin Water Quality Authority  
Technical Advisory Committee Meeting Agenda  
Thursday, December 1, 2022, 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
2. Meeting Minutes from November 3, 2022 (enclosed)
3. Discussion and Action Items
  - a. 2023 TAC Chair and Vice Chair Positions (James)
  - b. Land Use Referral Process (Clary, enclosed)
  - c. Cherry Creek from Reservoir to Park Boundary (Borchardt, enclosed)
  - d. Lone Tree Creek and Windmill Master Plan Park Boundary to Reservoir (Clary, enclosed)
  - e. Lakes Nutrient Criteria -Recommendation to Delegate Authority to Board Subcommittee (DiToro/Clary, enclosed)
4. Discussion Items
  - a. Workshops for 2023 (Borchardt/Clary)
  - b. TAC Subcommittees (James)
5. Presentations
6. Updates
  - a. Cherry Creek Stewardship Partners (Davenhill)
  - b. TAC Members
  - c. TAC Subcommittees
  - d. Contractors
    - i. [Water Quality Update](#) (Stewart)
    - ii. Pollution Abatement Projects (Borchardt)
      - a. LUR Monthly Summary
      - b. CIP, Maintenance, and Operations Status Report
      - c. 2022 Annual PRF/PAP Observation and Maintenance Report (updated based on TAC's comments in November, enclosed)
    - iii. Regulatory (DiToro)
  - e. Manager
  - f. Other
7. Upcoming Events
8. Adjournment

**[CCBWQA Workplan](#)**

---

<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)



**Cherry Creek Basin Water Quality Authority  
Minutes of the Technical Advisory Committee  
Thursday, November 3, 2022, 9:00 a.m.**

**TAC Members Present**

Alex Mestdagh, Town of Parker  
Ann Woods, City of Greenwood Village (zoom)  
Ashley Byerley, SEMSWA  
David Van Dellen, Town of Castle Rock (zoom)  
Jacob James, TAC Chairman, City of Lone Tree  
Jason Trujillo, Board Appointee, Cherry Creek State Park (zoom)  
Jeremiah Unger, CDOT (zoom)  
Joseph Marencik, City of Castle Pines  
Jon Erickson, TAC Vice Chairman, Board Appointee, Colorado Parks and Wildlife (zoom)  
Lisa Knerr, Arapahoe County  
Rick Goncalves, Board Appointee (zoom)  
Ryan Adrian, Douglas County (zoom)  
Wanda DeVargas, Board Appointee, E-470 (zoom)

**Board Members Present**

Caryn Johnson, Town of Castle Rock (zoom)  
Margaret Medellin, Governor's Appointee (zoom)  
Steve Sundberg, City of Aurora (zoom)  
Tom Downing, Governor's Appointee (zoom)

**Others Present**

Alan Leak, RESPEC  
James Linden, SEMSWA (zoom)  
Jane Clary, Wright Water Engineers, CCBWQA Technical Manager  
Jessica DiToro, LRE Water (zoom)  
Richard Borchardt, R2R Engineers  
Val Endyk, CCBWQA

**1. Call to Order**

Jacob James called the meeting to order at 9:02 am.

**2. Meeting Minutes from October 6, 2022**

Lisa Knerr moved to approve the October 6, 2022 minutes. Seconded by Ashley Byerley. The motion carried.

**3. Discussion and Action Items**

**a. TAC Appointments and Recommendations for 2023**

Jacob James explained that every year the TAC reviews its current members and discusses recommendations for board appointed TAC members for the upcoming year. Jacob James presented a current [list](#) of TAC members.

Discussion included:

Jason Trujillo has 2 years and 6 months left before retirement. He plans to train his successor and introduce him/her to the CCBWQA TAC when appropriate.

Since TriCounty Health will dissolve as of January 1, 2023, we need to discuss reaching out to Douglas County Health and Arapahoe County Health.

TAC would like the Board to consider appointing Joe Maxwell with the USACE.

Discussion only. No motion made.

#### **b. Site Specific Standards Scope and Memo**

Jane Clary updated the TAC that Hydros Consulting has prepared a scope and cost estimate to develop site-specific nutrient standards for Cherry Creek Reservoir. The Hydros [memo](#) was provided to the TAC. Based on review of this memorandum, the approach and cost estimate are believed to be appropriate for the project. Additionally, Hydros has included multiple “go/no-go” steps in their approach that would enable the effort to end at an interim step in the process, if directed by CCBWQA. Hydros’ proposed budget is \$87,755 with an optional task for additional meetings of \$5,000 for a total of \$92,755. This cost has been included in the proposed 2023 CCBWQA budget.

Discussion included:

Intent is to have Hydros finish the technical analysis by Dec. 2023, with a planned start date following the April RMH, which may affect the analysis/path forward.

Contingency in the budget would allow for flexibility for additional meetings.

Future TMDL will require millions of dollars in expenditures, so having appropriate nutrient targets is important. Important that CCR not be “thrown into the same bag” with other reservoirs as we are very unique, have our own robust data set, and have consultants that can do the work to develop site-specific standards.

Multiple decision points for the CCBWQA to decide if we should continue with work or stop.

Intend to continue collaborating with WQCD throughout the site-specific standards development process.

Rick Goncalves moved to recommend that the Board engage Hydros Consultants to conduct analysis to develop site-specific standards for Cherry Creek Reservoir in accordance with the scope of work and cost estimate provided by Hydros Consultants on September 16, 2022. Seconded by Jon Erickson. The motion carried.

#### **c. 2022 Annual PRF/PAP Observation and Maintenance Report**

Rich Borchardt presented the [2022 Annual Field Observation](#) of Pollution Reduction Facilities (PRFs) at Cherry Creek State Park. The purpose of the Field Observation is to assess whether the PRFs are functioning as designed and to identify routine, restorative, and rehabilitative maintenance requirements. The TAC will use this report to provide recommendations to the Board for maintenance activities. The 2023 maintenance budget is based on these observations. Restorative and rehabilitative maintenance requirements are the responsibility of the CCBWQA with the exception of West Boat Ramp where CCSP performs maintenance. Routine maintenance is the responsibility of CCSP.

The conclusions from the 2022 Annual Field Observation of PRFs are:

- All PRFs appear to be performing their functions. The Field Observation assessments include thoughts on maintenance, monitoring, and planning efforts for future capital projects.
- The maintenance identified for consideration by the TAC and Board includes a Summary of Operation & Maintenance costs and individual budget estimates for Restorative/Rehabilitation work included in Appendix A. The Operations and Maintenance cost as the result of this Field Observation for 2022 is \$53,600 as compared to the 2021 budget of \$204,850.
- Concerns and issues that were located outside the limits of the original PRF or require additional analysis/study beyond the engineering already done for the original PRF were suggested as planning

efforts. These planning efforts would identify the capital project needed, determine priority, identify the water quality benefit, and costs.

Discussion included:

Cherry Creek 12-mile Park Phase III was added to the PRF Field Observation.

A significant storm event occurred in August 2022 and higher flows were observed on Cherry Creek and Cottonwood Creek triggering post-storm observations on those PRFs.

Maintenance projects were included for:

- Cottonwood Creek had compaction of topsoil impacts to vegetation along access at embankment on wetland pond.
- Shop Creek drop structures are experiencing spalling of concrete at crests and vegetation growing on drop faces.
- Mountain/Lake Loop Shoreline has erosion near main parking lot for Lake Loop.
- Vegetation management on Cherry Creek 12-mile park Phase III and East Boat Ramp where construction and seeding was done in 2022.

Shop Creek may need special attention moving forward due to seepage and spalling concrete on drop structures.

- Drop structures are monitored on an annual basis.
- Timeline for a more significant project in this area: we are approaching the design life of the drop structures and likely more significant repairs. The crest repairs on the three drop structures will hopefully extend the life of the drops until more significant repairs are needed.

CCSP requested a separate summary sheet identifying what needs priority within the park. Rich will highlight action items when he communicates with Jason and Claudia at CCSP.

TAC requested that:

- weed control will be replaced by vegetation management, weed control will start with mechanical cutting of weeds until native grasses mature enough to allow for herbicide treatment of weeds; and,
- add dates to photos.

Rick Goncalves moved to accept the 2022 Annual PRF/PAP Observation and Maintenance Report with proposed weed control changes. Seconded by Lisa Knerr. The motion carried.

#### **d. 2023-2032 Capital Improvement Program**

Rich Borchardt provided the TAC with a summary of 2023-2032 Capital Improvement Program (CIP). Table 1 provides the water quality benefit of dollars per pound of phosphorus. Table 2 outlines the pollutant reduction facilities. Figures 1 and 2 compare the water quality benefits for stream reclamation projects in CCSP and partner projects (generally outside of CCSP) respectively. The CIP with summary tables and accompanying figures for stream reclamation both inside and outside CCSP can be found [here](#).

Rich noted changes to CIP previously provided at the October TAC Meeting; these changes are noted in purple in the CIP.

Discussion included:

Benefits of partnering on projects.

At the next TAC meeting, Staff will provide a technical memorandum that outlines the results of a field investigation of the Lone Tree Creek in CCSP upstream of the confluence with Cottonwood Creek.

Discussion around comparing projects and the benefits of phosphorus removal in the different creeks and factoring inflation into planning efforts.

Incorporating these projections into the Watershed Plan.

Improving water quality benefit comparison in future CIPs by normalizing costs (using the CPI and adjusting cost to a common year).

Lisa Knerr moved to recommend the Board approve the 2023-2032 Capital Improvement Program. Seconded by Alex Mestdagh. The motion carried.

#### **e. Lake Nutrients Criteria RMH**

Jessica DiToro explained to the TAC that CCBWQA Staff has reviewed the WQCD's sPPHS and has determined that it does not substantively affect the CCBWQA's previously submitted RPHS. Staff recommends that CCBWQA resubmit its RPHS so that it includes a brief letter from Hydros as an exhibit that describes the above statement in more detail. The [letter](#) from Hydros was included in the TAC packet for review. Staff also recommends that the following sentence be added to the beginning of the RPHS: *"CCBWQA has reviewed the Division's Supplemental Proponent's Prehearing Statement and determined that it does not substantively affect the CCBWQA's previously submitted RPHS, as described in Exhibit X."* Participation in this RMH effort is covered under the current CCBWQA regulatory budget for fiscal year 2022 and is also included in the draft budget for fiscal year 2023.

Discussion included:

- Sharing the RPHS with the WQCD ahead of time as an opportunity to discuss details and negotiate and allow additional time for Rebuttal Statement drafting. The Board already authorized Staff to coordinate with WQCD.

Ashley Byerley moved that TAC recommends that the Board retract the previously submitted Responsive Prehearing Statement (RPHS) and resubmit its RPHS for the Lakes Nutrient Criteria Rulemaking Hearing with the attached 10-7-22 letter from Hydros included as an exhibit to the new RPHS. Brief text referencing the exhibit will also be included in the revised RPHS. TAC also recommends that Staff continue to coordinate with the WQCD on this topic as previously directed. Seconded by Rick Goncalves. The motion carried.

#### **f. Watershed Modeling**

Jane Clary introduced RESPEC's [technical memo](#) to the TAC and explained that the memo presents the assumptions, methods, and results of a hypothetical 2030 land use and associated wastewater discharge scenario using the existing Cherry Creek Watershed HSPF watershed model application.

Suggested next steps include reconvening the TAC's Modeling Committee to review recommendations in RESPEC's memo and consider whether additional model scenarios should be completed and identify recommendations for next steps to the TAC. Additionally, outputs from the Watershed Model should be packaged in a manner to be linked with the Reservoir Model previously developed by Hydros.

Alan Leak from RESPEC explained that this is a planning document. The goal is to predict possible outcomes from various future scenarios, ultimately linking the watershed model to the reservoir to evaluate how the reservoir responds under various conditions.

Discussion included:

Timeline for next steps.

May be appropriate to model anticipated nitrogen reductions for WWTFs.

Subcommittee should be set up to review RESPEC's recommendations and identify additional model run scenarios of interest to the Board. Some discussion about a watershed-specific modeling committee or Res+Watershed modeling committee. Findings from the BMP effectiveness study should be reviewed to see if adjustments to model assumptions are needed.

Some discussion about modeling budget for 2023; RESPEC has an on-call contract. A scope for modeling work should be developed.

Need to identify members of subcommittee at December TAC and start committee in January 2023.

Ryan Adrian moved that the TAC recommends that the Board accept the Technical Memorandum prepared by RESPEC summarizing findings of the Cherry Creek HSPF Watershed Model 2030 Buildout Scenario. Seconded Rick Goncalves. The motion carried.

**4. Discussion Items**

**a. TAC Chairman and Vice Chairman Positions**

Jacob James noted that next month TAC will vote on chair and vice chair positions. Jon Erickson is still willing to be chair. Lisa Knerr volunteered to serve as vice chair.

**5. Presentations**

**6. Updates**

**a. Cherry Creek Stewardship Partners**

**b. TAC Members**

SPLASH group working on rain barrel workshops with a waiting list of people wanting rain barrels. Possible rain garden education upcoming.

Turf conversion grants are being offered by some local governments/water utilities in the watershed.

Updates to land development codes are also in progress. High-water turf varieties, turf conversions, and low-water and native landscape alternatives are being encouraged.

**c. TAC Subcommittees**

**d. Contractors**

**i. [Water Quality Update](#) (Stewart)**

On behalf of Erin Stewart, Jane Clary presented the [water quality update](#).

**ii. Pollution Abatement Projects (Borchardt)**

**a. [LUR Monthly Summary](#)**

**b. [CIP, Maintenance, and Operations Status Report](#)**

**iii. Regulatory (DiToro)**

**e. Manager**

Dec. TAC - changes to Land Use Referral reviews and MS4 subcommittee will be discussed. Notice needs to be given to local agencies of the proposed process change.

**f. Other**

**7. Upcoming Events**

**8. Adjournment**

Jacob James adjourned the meeting at 11:07 am.

[CCBWQA Workplan](#)



## MEMORANDUM

**To:** CCBWQA Board  
**From:** Executive Committee  
**Date:** December 15, 2022 [DRAFT TO BE FINALIZED FOLLOWING TAC INPUT]  
**Re:** Land Use Reviews

---

During the preparation of the CCBWQA 2023 Annual Budget, the Executive Committee recommended and the Board approved eliminating routine technical reviews of land development type activities (called “Land Use Reviews”) from local governments for compliance with Control Regulation 72. This memorandum addresses how this change will be implemented during 2023.

**Background.** Review of land disturbance activities for compliance with Regulation 72, namely implementation of construction and post-construction BMPs, was initiated in the early 2000’s. Since that time, local governments have progressively become more sophisticated and experienced in ways to minimize the discharge of pollutants during and after development activities, as demonstrated by the minimal number of referrals where the Authority did not recommend approval of projects to local government. Additionally, recent municipal separate storm sewer system (MS4) permits are more explicit regarding requirements for compliance with Regulation 72. For these reasons, the Authority believes that the local government’s review is sufficient to ensure compliance with Regulation 72 requirements. In cases where the local government would like additional review or consultation with the Authority, the Authority’s Technical Manager will be available to discuss questions or arrange an independent review if needed.

**TAC Review.** Eliminating the Authority’s Land Use Reviews was discussed at a TAC meeting during which time the TAC supported this change but had questions regarding local governments’ need for the Authority’s “approval” as part of their MS4 permits and how the change would be implemented. The TAC formed a subcommittee to review changes in the procedure and recommended approval of the procedure at the **December 1, 2022 TAC meeting**.

**Proposed Process.** The Executive Committee recommends the following initial approach for 2023 that can be altered as needed to meet both the Authority and local government requirements.

- Local governments will continue to notify the Authority of proposed development plans by email addressed to [LandUseReferral@ccbwwqa.org](mailto:LandUseReferral@ccbwwqa.org). The Authority's Administrative Assistant will respond by email or other established electronic system with the following statement:

The Cherry Creek Basin Water Quality Authority (Authority) acknowledges notification from [*local agency*] that the proposed development plans for [*development name or project ID*] have been or will be reviewed by the [*local agency*] for compliance with the applicable Regulation 72 construction and post-construction requirements. Based on the Authority's current policy, the Authority will no longer routinely conduct a technical review and instead the Authority will defer to the [*local agency's*] review and ultimate determination that the proposed development plans comply with Regulation 72.

- To request a technical review of the proposed development plan, please contact [LandUseReferral@ccbwwqa.org](mailto:LandUseReferral@ccbwwqa.org). The review may include consultation with the Authority's Technical Manager to address specific questions or a more detailed Land Use Review, if warranted.

**Timing:** This process will become effective as determined by the Board.

**Budget Impact.** Eliminating Land Use Reviews is expected to reduce the Authority's budget requirements by over \$30,000 per year.

**Recommended Action.** Motion to recommend that the Board update its policy on the land use referral process as described in this Action Memo.

**Next Steps.** The Board will be updated on how the process is working or where additional changes to the process may be needed.





## ACTION ITEM MEMORANDUM

**To:** CCBWQA Technical Advisory Committee (TAC)  
**From:** Richard Borchardt, Pollution Abatement Project Manager  
**Date:** November 28, 2022  
**Subject:** Cherry Creek from the Reservoir to Cherry Creek State Park (CCSP) Boundary – Stream and Water Quality Assessment and Baseline Channel Monitoring Reports

**Request:** The TAC accepts the Stream and Water Quality Assessment and Baseline Channel Monitoring Reports and recommends to the Board that a workshop be scheduled to seek input and direction from the TAC and Board to determine CCBWQA’s next steps on Cherry Creek and Piney Creek within CCSP.

**Project:** CCBWQA sole-sourced the [Stream and Water Quality Assessment](#) and [Baseline Channel Monitoring](#) Reports to Muller Engineering in 2020 and 2021, respectively. Muller presented their initial findings to CCBWQA at the July 15, 2021 Board Meeting, which was followed by a field trip that included a stop on Cherry Creek near the Aurora water lines to observe existing conditions. Muller has now completed the two reports. The Stream and Water Quality Assessment report includes site conditions, historical alignment and profile comparisons, two-dimensional hydraulic model, geomorphic and sediment transport analysis, ecological assessment, and water quality analysis. The Baseline Channel Monitoring report includes field inspection, channel monitoring survey, stream flow analysis, lateral stream bank stability model, observations, and recommendations for monitoring.

Muller segmented Cherry Creek into three reaches starting at the Reservoir going upstream and included a fourth reach for Piney Creek, with the results of their analysis included in Table 2. Muller recommended monitoring of the reaches as shown in Table 3.

Muller’s scope of work includes two workshops (up to 4 hours each) to help CCBWQA digest the information in the reports, get input and direction from the TAC and Board and help CCBWQA determine its next steps. The workshop could inform some upcoming projects (Alternatives Analysis on Cherry Creek from Reservoir to Lake View Drive and Piney Creek Reaches 1 and 2) in CCBWQA’s Capital Improvement Project.

Reach	Bank	Length of Bank (ft)	Average Lateral Bank Erosion Rate (ft/yr)	Estimated Annual Soil Loss (ft <sup>3</sup> /yr)	Estimated Annual Soil Loss (tons/yr)	Estimated Annual TP Load from Soil Loss (lb/yr)
Reach 1	Left	5800	0.141	4314	160	92
	Right	5800	0.151	4768	177	101
Reach 2	Left	550	0.119	303	11	6
	Right	550	0.140	355	13	8
Reach 3	Left	7400	0.177	9271	343	197
	Right	7400	0.167	7393	274	157
Reach 4	Left	2000	0.371	6305	234	134
	Right	2000	0.313	4287	159	91

Table 2: BANCS Analysis and Total Phosphorus Summary by Reach

Monitoring Activity	Reach 1: Cherry Creek 5+00 to 63+00	Reach 2: Cherry Creek 63+00 to 116+00	Reach 3: Cherry Creek 116+00 to 190+00	Reach 4: Piney Creek 0+00 to 20+00
<u>Site Visit</u> Visual Assessment, photos, and report	Annually Post Major Storm Event	Annually Post Major Storm Event	Annually Post Major Storm Event	Annually Post Major Storm Event
<u>Detailed Survey</u> Monitoring Cross Sections and Channel Profile	Every 2 to 3 years Post Major Storm Event  Observed Significant Erosion or Deposition	Every 2 to 3 years Post Major Storm Event  Observed Significant Erosion or Deposition	Every 2 to 3 years Post Major Storm Event  Observed Significant Erosion or Deposition	Every 2 to 3 years Post Major Storm Event  Observed Significant Erosion or Deposition
<u>Drone</u> Aerial Imagery	Every 1 to 2 years Post Major Storm Event	Every 1 to 2 years Post Major Storm Event	Every 1 to 2 years Post Major Storm Event	Every 1 to 2 years Post Major Storm Event
<u>Drone</u> Aerial Topography	Every 5 years Post Major Storm Event Observed Significant Erosion or Deposition	Every 5 years Post Major Storm Event Observed Significant Erosion or Deposition	Every 5 years Post Major Storm Event Observed Significant Erosion or Deposition	Every 5 years Post Major Storm Event Observed Significant Erosion or Deposition

**Table 3: Summary of Channel Monitoring Activities**

**Budget:** No additional costs are associated with the workshop with CCBWQA’s TAC and Board. CCBWQA’s Capital Improvement Program includes \$200,000 for an Alternatives Analysis on Cherry Creek from Reservoir to Lake View Drive and \$63,000 for Piney Creek Reaches 1 and 2 in 2023.

**Reports:** See 12/1/2022 [TAC Packet directory](#) due to file size.

**Motion:** I move to accept the Stream and Water Quality Assessment and Baseline Channel Monitoring Reports prepared by Muller Engineering and recommend to the Board that a workshop be scheduled to seek input and direction from the TAC and Board to determine CCBWQA’s next steps on Cherry Creek and Piney Creek within CCSP.



**Wright Water Engineers, Inc.**

2490 West 26th Ave., Suite 100A  
Denver, Colorado 80211  
(303) 480-1700 TEL  
(303) 480-1020 FAX

www.wrightwater.com  
e-mail: aearles@wrightwater.com

November 28, 2022

**Via email: [Bill.Ruzzo@comcast.net](mailto:Bill.Ruzzo@comcast.net)**

Bill Ruzzo, P.E., Executive Committee Representative  
Cherry Creek Basin Water Quality Authority  
PO Box 3166  
Centennial, CO 8016

Re: Master Plan Update for Lone Tree and Windmill Creeks in Cherry Creek State Park

Wright Water Engineers, Inc. (WWE) has prepared this letter for the Cherry Creek Basin Water Quality Authority (Authority) to outline an approach for a companion master plan for portions of Lone Tree, Windmill and Cottonwood Creeks within Cherry Creek State Park. This work will build upon a Major Drainageway Plan (MDP) update for these watersheds that WWE is currently conducting for the upstream Southeast Metro Stormwater Authority (SEMSWA) service area, which includes the City of Centennial and Arapahoe County. The Mile High Flood District (MHFD), SEMSWA, and WWE have been working together in developing the MDP since January 2022, and it is anticipated to be completed in the summer of 2023. (Attachment 3 provides an overview of the MHFD/SEMSWA MDP for general reference.)

Based on our discussions over the past few weeks, WWE proposes four primary tasks:

- Task 1. Evaluate Current Conditions – Much of Task 1 can build upon work WWE has already completed with SEMSWA regarding updating the hydrology for these watersheds. For Task 1, WWE will provide an update to these studies to incorporate contributing drainage areas previously not included within the Cherry Creek State Park. This will include generating updated hydrology for several watersheds including Lone Tree Creek, Windmill Creek and Cottonwood Creek that have been identified as needing routing in this model. WWE will also meet with designated representatives of the Authority<sup>1</sup> and other stakeholders to identify priority areas for evaluation of the existing site condition, including a discussion of flood history if applicable. Early input from Colorado Parks and Wildlife representatives for Cherry Creek State Park and U.S. Army Corps of Engineers representatives will be critical for the project. Based on these discussions and a review of the existing hydrology, WWE staff will perform field work to collect information on these waterways. Field work will include an evaluation of existing stream corridors, contributing watersheds, storm conveyance, and water quality control measures.

---

<sup>1</sup> WWE will defer to the Authority to determine whether meetings will include designated representatives of the Board, TAC members and/or the Board itself. This group should be identified early in the project.

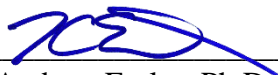
- Task 2. Develop Alternatives – Based on the findings of the site visit and hydrology assessment, WWE will develop a master list of potential improvement projects within the three watersheds to be considered for inclusion in the master plan. From this list, WWE will meet with designated representatives of the Authority and other stakeholders to determine which drainage improvements should be evaluated further in the master plan update. This initial qualitative screening will be documented so that it is clear which initial ideas were considered but eliminated from further consideration. For Cottonwood Creek, although hydrology will be completed to the reservoir, alternatives evaluation will primarily focus on management alternatives rather than structural alternatives. One of the goals of the alternatives development will be to address issues with an existing relic stock pond on Lone Tree Creek just downstream of the access road to the Caretakers Cabin. The pond accepts primary flow and more frequent storm events from Lone Tree Creek. Severe erosion is occurring below and within the spillway. Alternatives evaluated for this pond will include ways to address the apparent lack of existing water rights, nutrient retention, and potential embankment failure. Another major component of the alternatives analysis will include planning for the major and minor storm flow paths of Lone Tree Creek, which currently splits flow with the main branch going to the retention pond and a secondary branch going to Windmill Creek. In addition to these focus areas, the alternatives development process will consider stream restoration, flow conveyance, channel instability, wetland preservation, culvert capacity, adaptive stream management strategies, planning for recreational trail crossings of waterways, and management of pollution reduction facilities (PRFs).
- Task 3. Evaluate Alternatives and Develop MDP – WWE will evaluate and select alternatives from Task 2. Selection of alternatives will incorporate feedback from designated representatives of the Authority, stakeholders, and the public (e.g., birding community, trail users). This task also includes some time for public outreach. We assume that WWE will assist in providing content for stakeholder and community outreach. We also have budgeted for developing a simple presentation providing an overview of the master plan update that can be provided to the Authority, stakeholders and the public. These results will be incorporated into a report including generation of graphics, mapping, preliminary cost analysis (budget-level costs), and conceptual sizing calculations. Conceptual design is not included in the project scope. The report will be in a form suitable for posting to the Authority’s website and will be prepared as a companion report to the ongoing MHFD/SEMSWA project described in Attachment 3.
- Task 4. Project Management and Plan Review – This task includes time for project management; internal coordination meetings; check-in calls with the project team; review of tasks, time, and charges; and similar tasks. We have assumed that WWE staff will attend two monthly Board and/or TAC meetings. This task also includes some time for ad hoc meetings as needed with Board/TAC members and stakeholders and general correspondence not related to Tasks 1 - 3. WWE will submit the draft report and all required supplementary materials to the Authority and stakeholders for review and comment. Task 4 includes addressing and responding to one round of formal comments from the Authority’s representatives.


WWE has attached a spreadsheet that lists each of these tasks and estimated hours and costs. WWE's estimated budget for this scope of work is \$40,000, including an allowance for direct costs. Additionally, we have identified a \$4,000 contingency for additional meetings or reviews, if needed and directed by the Authority. WWE's standard hourly rate schedule also is attached.

We look forward to kicking this work off in 2023. If you have any further comments on the proposed scope of work or estimated budget, we would be glad to have a meeting to discuss. We really appreciate the opportunity to conduct this work for the Authority.

Sincerely,

WRIGHT WATER ENGINEERS, INC.

By   
Andrew Earles, Ph.D., P.E., D.WRE  
Vice President of Water Resources

By   
Maggie Lewis, P.E.  
Water Resources Engineer

#### Attachments

1. Worksheet with Tasks, Hours, and Costs
2. WWE 2022 Rate Schedule
3. MHFD-SEMSWA Southwest Tributaries Master Drainage Plan Scope (for reference)

cc: Jane Clary, WWE, [clary@wrightwater.com](mailto:clary@wrightwater.com)

# **Attachment 1**

**Worksheet with Tasks, Hours and Costs**

Attachment A												
Master Plan for Lone Tree and Windmill Creek in the Cherry Creek State Park												
Proposed Scope of Work and Estimated Budget												
Staff	Role	Rate	Task 1. Evaluate Existing Conditions		Task 2. Develop Alternatives		Task 3. Evaluate Alternatives and Develop MDP		Task 4: Project Management and Plan Review		Total	
			Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Earles	Project Manager	\$242	10	\$2,420	15	\$3,630	10	\$2,420	12	\$2,904	47	\$11,374
Lewis	Project Engineer	\$157	22	\$3,454	30	\$4,710	20	\$3,140	16	\$2,512	88	\$13,816
Wilson	Project Engineer	\$115	28	\$3,220	20	\$2,300	22	\$2,530	8	\$920	78	\$8,970
Clary	Peer Review	\$231	4	\$924	4	\$924	8	\$1,848	2	\$462	18	\$4,158
Waters	Admin	\$93		\$0		\$0	4	\$372	6	\$558	10	\$930
Subtotals Labor			64	\$10,018	69	\$11,564	64	\$10,310	44	\$7,356	241	\$39,248
Estimated direct costs (plotting, phone, mileage, etc., estimated at ~ 2% of labor subtotal)												\$752
<b>Total</b>												<b>\$40,000</b>
Contingency (10% for additional meetings, if needed)												\$4,000

**Tasks**

Task 1. Evaluate Current Conditions – Much of Task 1 can build upon work WWE has already completed with SEMSWA regarding updating the hydrology for these watersheds. For Task 1 WWE will provide a companion to these studies to incorporate contributing drainage areas previously not included within the Cherry Creek State Park. This will include generating hydrology for several sub-basins that have been identified as needing routing in this model. WWE will also meet with designated representative of the Board (including the State Park) and other stakeholders to identify priority areas for evaluation of the existing site condition, including a discussion of flood history if applicable. Based on these discussions and a review of the existing hydrology, WWE staff will perform field work to collect information on these waterways. Field work will include an evaluation of existing stream corridors, contributing watersheds, storm conveyance, and water quality control measures.

Task 2. Develop Alternatives – Based on the findings of the site visit and hydrology assessment, WWE will develop a list of potential improvements projects within the three watersheds to be considered for inclusion in the master plan. From this list, WWE will meet with the designated Board representatives and other stakeholders to determine which drainage improvements should be evaluated in the master plan update. The alternatives development process will consider stream restoration, flow conveyance, channel instability, wetland preservation, culvert capacity, adaptive stream management strategies, planning for recreational trail crossings of waterways, and management of pollution reduction facilities (PRFs).

Task 3. Evaluate Alternatives and Develop MDP – WWE will evaluate and select alternatives from Task 2. Selection of alternatives will incorporate feedback from designated representatives of the Board, stakeholders, and the public. This task also includes some time for public outreach. We assume that WWE will assist in providing content for stakeholder and community outreach. We also have budgeted for developing a simple presentation providing an overview of the master plan update that can be provided to stakeholders and the public. These results will be incorporated into a MDP report companion including generation of graphics, mapping, preliminary cost analysis, and conceptual sizing calculations.

Task 4. Project Management and Plan Review – This task includes time for project management; internal coordination meetings; check-in calls with the project team; review of tasks, time, and charges; and similar tasks. We have assumed that WWE staff will attend four meetings identified by the CCBWQA. This task also includes some time for ad hoc meetings as needed with Board members and stakeholders and general correspondence not related to Tasks 1 - 3. WWE will submit the draft report and all required supplementary materials to designated Board representatives, the TAC and stakeholders for review and comment. Task 4 includes addressing and responding to one round of formal comments from CCBWQA.

**Notes and Assumptions**

Task 1 includes two 6-hr field visits by two WWE staff.

Task 3 includes one formal meeting and presentation with stakeholders.

The anticipated review process for Task 4 includes a response to one set of comments. Contingency funds may be used if additional rounds of review are needed.

Contingency added to allow for additional meetings or reviews. Contingency will not be used without prior approval from the CCBWQA.

# **Attachment 2**

## **WWE 2022 Rate Schedule**



**WRIGHT WATER ENGINEERS, INC.  
2022 SCHEDULE OF HOURLY RATES  
SCHEDULE A**

PERSONNEL	RATE PER HOUR
SENIOR PRINCIPAL/CONSULTANT	\$242
PRINCIPAL/CONSULTANT	\$231
SENIOR PROJECT ENGINEER/CONSULTANT	\$207
SENIOR ENGINEER/SCIENTIST CONSULTANT	\$184
ENGINEERING/SCIENTIST PROFESSIONAL I	\$171
ENGINEERING SPECIALIST/CONSULTANT	\$157
ENGINEERING/SCIENTIST PROFESSIONAL II	\$140
ENGINEERING DESIGNER/PROFESSIONAL III	\$129
ENGINEERING TECHNICIAN I	\$115
ENGINEERING TECHNICIAN II	\$100
ENGINEERING TECHNICIAN III	\$97
ENGINEERING TECHNICIAN IV	\$80
ENGINEERING TECHNICIAN V	\$73
◆ Automobile at 60 cents per mile	◆ GIS computer at 20 dollars per hour.
◆ Four-wheel drive/Pick-up truck vehicle at 70 cents per mile	◆ Info water® at 20 dollars per hour.
◆ AutoCAD computer at 15 dollars per hour.	◆ Civil 3D at 25 dollars per hour.
<i>Seven and one-half percent (7.5%) will be added to all reimbursable expenses to cover administration for special consultants, independent laboratory tests, direct printing costs, telephone, supplies, lodging and subsistence, all in-house computer, auto, postage, fax, and travel.</i>	

**TERMS OF PAYMENT:** It is agreed that this account will be billed on a monthly basis. Unless otherwise approved by the Company, payment is due upon receipt of invoice. Mail payment to the main office of the Company at 2490 West 26th Avenue, Suite 100A, Denver, Colorado 80211.

## **Attachment 3**

**MHFD-SEMSWA Southwest Tributaries Master Drainage Plan Scope  
(for reference)**

Account No.:	20-07-75111-108254
Amount:	\$179,500

AGREEMENT REGARDING CONSULTING SERVICES FOR  
MAJOR DRAINAGEWAY PLAN UPDATE FOR COTTONWOOD, LONE TREE  
WINDMILL, AND DOVE CREEKS

Agreement No. 21-12.21  
Project No. 108254

THIS AGREEMENT, by and between URBAN DRAINAGE AND FLOOD CONTROL DISTRICT D/B/A MILE HIGH FLOOD DISTRICT (hereinafter called "DISTRICT") and WRIGHT WATER ENGINEERS, INC., a professional consulting firm (hereinafter called "CONTRACTOR") and collectively known as "PARTIES";

WITNESSETH THAT:

WHEREAS, DISTRICT has previously established a work program for 2021 (Resolution No. 66, Series of 2020) which includes master planning; and

WHEREAS, DISTRICT desires to engage CONTRACTOR to render certain technical and professional services to major drainageway plan updates for Cottonwood, Lone Tree, Windmill, and Dove Creeks.

NOW, THEREFORE, in consideration of the mutual promises contained herein, PARTIES hereto agree as follows:

1. EMPLOYMENT OF CONTRACTOR

DISTRICT will engage CONTRACTOR and CONTRACTOR hereby agree to perform the services hereinafter set forth.

2. SCOPE OF SERVICES

The SCOPE OF SERVICES is detailed in Exhibit A.

3. COST OF SERVICES

DISTRICT agrees to pay CONTRACTOR a sum not to exceed One Hundred Seventy Nine Thousand Five Hundred Dollars (\$179,500) for all services described herein, subject to the terms and conditions of Paragraphs 4 and 5 below, unless a change in the Scope of Services is approved in accordance with Paragraph 11 below.

4. BASIS OF PAYMENT

CONTRACTOR shall receive from DISTRICT as full and complete payment for the work under this Agreement a task-based rate not to exceed the amount specified under Paragraph 3, which sum is assigned to each task in Exhibit B.

5. METHOD OF PAYMENT

CONTRACTOR shall receive monthly partial payments for work completed in the preceding pay period based on a percentage of the amount of work actually completed at the time of billing and mutually agreed upon by PARTIES. All billing items shall be referenced to the tasks identified under Exhibit A of this Agreement. If billings are received by the 25th of the month, payment shall be by the 25th of the following month. Otherwise, payment shall be delayed by an additional full

month. CONTRACTOR shall, for all billings, keep work and cost records that shall permit any comparison with Exhibits A and B.

6. PERSONNEL

A. CONTRACTOR represents that it shall use as a minimum the following personnel in performing the services under this Agreement:

NAME	RESPONSIBILITY
Andrew Earles	Project Manager
Maggie Lewis	Project Engineer

Any change in the above personnel must have approval of DISTRICT, which approval shall not be unreasonably withheld.

B. All of the services required hereunder, except where specified, shall be performed by CONTRACTOR's personnel or CONTRACTOR's subcontractors and all personnel engaged in the services shall be fully qualified and shall be authorized under applicable state or local law to perform such services.

C. None of the services covered by this Agreement, except where specified, shall be subcontracted without the prior approval of DISTRICT.

7. TIME OF PERFORMANCE

The Time of Performance is through December 31, 2023.

8. DIRECTION OF EFFORT AND COORDINATION

Notwithstanding any of the provisions of this Agreement, the Executive Director of DISTRICT will be the only individual authorized to redirect the effort or in any way amend or modify the terms of this Agreement. DISTRICT may appoint a Project Director who shall represent the Executive Director in matters related to PROJECT. All such redirection shall be transmitted in writing and directed to CONTRACTOR's Project Manager, and shall be subject to the provisions of Paragraph 11.

9. OWNERSHIP OF DATA

Ownership, in paper and electronic form, of all data; drawings; details, documents; special software; spreadsheets and templates; photographs; and information collected, acquired, developed, and documented under this Agreement (hereinafter called "DATA") shall be vested with DISTRICT. CONTRACTOR may retain a record copy of such DATA. Should DISTRICT see fit to make use of DATA assembled under this Agreement for a use not included under the scope of this Agreement, DISTRICT will assume all subsequent liability for such use and CONTRACTOR shall not make claims of liability against DISTRICT for such use.

10. TERMINATION OF AGREEMENT

This Agreement may be terminated by DISTRICT and/or CONTRACTOR, upon seven (7) days' written notice. In the event of termination, CONTRACTOR shall be paid for services performed to

termination date as determined by DISTRICT. This payment shall be full satisfaction of all obligations to CONTRACTOR under this Agreement.

All DATA shall be surrendered to DISTRICT by CONTRACTOR before payment is made.

11. CHANGES IN AGREEMENT

DISTRICT may request changes in the scope of services of CONTRACTOR. Such changes, including any increase or decrease in the amount of CONTRACTOR's compensation or/and time of performance, which are mutually agreed upon by and among PARTIES shall be incorporated in written amendments to this Agreement.

12. INSURANCE

During the performance of the work defined by this Agreement, CONTRACTOR, acting as an independent contractor, shall be solely responsible for procuring and keeping in full force and effect the insurance listed below:

INSURANCE	MINIMUM LIMITS
A. Commercial General Liability	\$1,000,000 each occurrence and in the aggregate in combined single limit coverage for bodily injury and property damage
B. Professional Liability	\$250,000 each claim and in the aggregate
C. Automobile Liability	\$600,000 each occurrence in combined single limit coverage for bodily injury and property damage
D. Workers' Compensation	
1. Workers' Compensation	statutory limits required by law
2. Employer's Liability	statutory limits required by law

The limits of coverage listed above are as required by DISTRICT. CONTRACTOR shall evaluate individual needs regarding higher levels of insurance.

Except for Professional Liability insurance, each type of insurance procured by CONTRACTOR shall provide coverage for all claims arising out of, or in connection with, any operations, work, or services performed under this Agreement by CONTRACTOR, CONTRACTOR's employees, subconsultants, subcontractors, agents, or representatives. CONTRACTOR's Professional Liability insurance shall provide coverage for claims arising out of the negligent acts, errors and omissions of CONTRACTOR in the performance of services under this Agreement. CONTRACTOR may elect not to provide the above-specified coverage for the subconsultants or subcontractors. In that event, CONTRACTOR shall require that the subconsultants or subcontractors procure and maintain the same insurance coverage as set forth above. DISTRICT shall be listed as "additionally insured" on all commercial liability insurance policy/certificates and all automobile liability insurance policy/certificates.

Certificates of insurance showing CONTRACTOR is carrying the above-described insurance shall be provided to DISTRICT at the time of execution of this Agreement. As necessary, certificates of insurance showing the subconsultants and subcontractors are carrying the above described

insurance shall be provided to DISTRICT within ten (10) days of beginning work by the subconsultant or subcontractor pertaining to this Agreement. All the certificates of insurance shall include language stating that, should the insurance policy be canceled before its expiration date, the insurance company shall provide 30 days written notice to DISTRICT. The costs of insurance shall be considered a part of the overhead costs of CONTRACTOR.

13. INDEMNIFICATION

CONTRACTOR shall indemnify and save DISTRICT harmless from and against claims, demands, liabilities, damages, suits, actions, or causes of action including reasonable attorney's fees and costs which may be brought or asserted against any or all of the above named only to the extent and for an amount represented, or caused by the negligent acts, errors, or omissions in the performance of the work under this Agreement by CONTRACTOR, CONTRACTOR's employees, subconsultants, subcontractors, agents, or representatives together with any liability accrued by any or all of the above-named on account thereof.

14. ASSIGNABILITY

This Agreement is for the expert professional services of the personnel of CONTRACTOR, and is not assignable, save and except with the consent of DISTRICT who may withhold consent at their option with or without cause.

15. APPLICABLE LAWS

This Agreement shall be governed by and construed in accordance with the laws of the State of Colorado. Jurisdiction for any and all legal actions regarding this Agreement shall be in the State of Colorado and venue for the same shall lie in the County where PROJECT is located.

16. NO DISCRIMINATION IN EMPLOYMENT

In connection with the performance of work under this Agreement, CONTRACTOR agrees not to refuse to hire, discharge, promote or demote, or to discriminate in matters of compensation against any person otherwise qualified on the basis of race, color, ancestry, creed, religion, national origin, gender, age, military status, sexual orientation, gender identity, marital status, or physical or mental disability and further agrees to insert the foregoing provision in all subcontracts hereunder.

CONTRACTOR shall provide a list of subcontractors and which of those subcontractors are Disadvantaged Business Enterprises (DBE) and the basis for determining or defining the subcontractor as a DBE. The list shall be submitted prior to final payment.

17. WORKER WITHOUT AUTHORIZATION

A. At the time of execution of this Agreement, CONTRACTOR does not knowingly employ or contract with a worker without authorization who will perform work under this Agreement.

B. CONTRACTOR shall participate in the E-Verify Program, as defined in § 8 17.5-101(3.7), C.R.S., to confirm the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement.

- C. CONTRACTOR shall not knowingly employ or contract with a worker without authorization to perform work under this Agreement.
  - D. CONTRACTOR shall not enter into a contractor with a subconsultant or subcontractor that fails to certify to CONTRACTOR that it shall not knowingly employ or contact with a worker without authorization to perform work under this Agreement.
  - E. CONTRACTOR shall confirm the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement through participation in the E-Verify Program.
  - F. CONTRACTOR is prohibited from using the E-Verify Program procedures to undertake pre-employment screening of job applicants while performing its obligation under this Agreement, and that otherwise requires CONTRACTOR to comply with any and all federal requirements related to use of the E-Verify Program including, by way of example, all program requirements related to employee notification and preservation of employee rights.
  - G. If CONTRACTOR obtains actual knowledge that a subconsultant or subcontractor performing work under this Agreement knowingly employs or contract with a worker without authorization, it will notify such subconsultant or subcontractor and PARTIES within three (3) days. CONTRACTOR shall also then terminate such subconsultant or subcontractor if within three (3) days after such notice the subconsultant or subcontractor does not stop employing or contracting with the illegal alien, unless during such three (3) day period the subconsultant or subcontractor provides information to establish that the subconsultant or subcontractor has not knowingly employed or contracted with a worker without authorization.
  - H. CONTRACTOR shall comply with any reasonable request made in the course of an investigation by the Colorado Department of Labor and Employment under authority of § 8-17.5-102(5), C.R.S
  - I. CONTRACTOR shall, within twenty days after hiring an employee who is newly hired for employment to perform work under this Agreement, affirms that it has examined the legal work status of such employees, retained file copies of the documents required by 8 U.S.C. Section 1324a, and not altered or falsified the identification documents for such employees. CONTRACTOR shall provide a written, notarized copy of the affirmation to PARTIES.
18. EXECUTION IN COUNTERPARTS – ELECTRONIC SIGNATURES  
This Agreement, and all subsequent documents requiring the signatures of PARTIES to this Agreement, may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. PARTIES approve the use


of electronic signatures for execution of this Agreement, and all subsequent documents requiring the signatures of PARTIES to this Agreement. Only the following two forms of electronic signatures shall be permitted to bind PARTIES to this Agreement, and all subsequent documents requiring the signatures of PARTIES to this Agreement.

- A. Electronic or facsimile delivery of a fully executed copy of a signature page; or
  - B. The image of the signature of an authorized signer inserted onto PDF format documents.
- Documents requiring notarization may also be notarized by electronic signature, as provided above. All use of electronic signatures shall be governed by the Colorado Uniform Electronic Transactions Act, §§ 24-71.3-101-121, C.R.S.

WHEREFORE, PARTIES hereto have caused this instrument to be executed by properly authorized signatories as of the date and year written below.



WRIGHT WATER ENGINEERS, INC.

By   
DocuSigned by:  
2E64DDAA1CE240C...

Name Andrew Earles

Title Vice President

Date 16 December 2021

*AE*

URBAN DRAINAGE AND  
FLOOD CONTROL DISTRICT D/B/A  
MILE HIGH FLOOD DISTRICT

By   
DocuSigned by:  
3982FD229529485...

Name Ken A. MacKenzie

Title Executive Director

Date 17 December 2021

DS  
*BS*

---

Checked By



**Wright Water Engineers, Inc.**

2490 West 26th Ave., Suite 100A  
Denver, Colorado 80211  
(303) 480-1700 TEL  
(303) 480-1020 FAX

www.wrightwater.com  
e-mail: aearles@wrightwater.com

November 22, 2021

**Via email:** [kbauer@mhfd.org](mailto:kbauer@mhfd.org) & [madams@semswa.org](mailto:madams@semswa.org)

Kurt Bauer, P.E., CFM  
Mile High Flood District  
2480 W. 26<sup>th</sup> Avenue, Suite 156-B  
Denver, Colorado 80211

Tiffany Clark, P.E., CFM  
Southeast Metro Stormwater Authority  
7437 South Fairplay Street  
Centennial, Colorado 80112

Re: Major Drainageway Plan Update for Cottonwood, Lone Tree, Windmill, and Dove Creeks (SEMSWA Southwest Tributaries)

Dear Kurt and Tiffany:

Wright Water Engineers, Inc. (WWE) has prepared this letter to outline a proposal to update the Mile High Flood District (MHFD) master plans for Cottonwood, Lone Tree, Windmill, and Dove Creeks (referred to as Southwest Tributaries). We sincerely appreciate the input that we have received from MHFD and the Southeast Metro Stormwater Authority over the past month, and this has helped us to refine our proposed scope of work and estimated budget.

Based on our discussions over the past few weeks, WWE proposes five primary tasks:

- Task 1. Evaluate Current Conditions – Much of Task 1 can build upon work WWE has completed with SEMSWA regarding updating the hydrology for these watersheds and an evaluation of existing and future WQCV demand. For Task 1 WWE will use these studies to determine areas that have been quantified to need stormwater improvements or refinements to previously planned improvements. WWE will also meet with SEMSWA, MHFD, and other stakeholders to identify priority areas for evaluation of the existing site condition, including a discussion of flood history if applicable. Based on these discussions and a review of the existing studies, WWE staff will perform field work to collect information on areas identified as potential improvement projects in the MDP. Field work will also include an evaluation of existing wetland and riparian zones (high level evaluation based on Engenuity stream assessment and National Wetlands Inventory) and will revisit conclusions from 2004 study by WWE for these watersheds that was referenced in the effective MDP. One of the goals of the wetlands assessment will be to identify permits that may be needed to maintain online water quality and detention facilities that may be subject to Section 404 permitting requirements.
- Task 2. Develop and Select Alternatives – Based on the findings of the site visit and discussions with stakeholders, WWE will develop a list of potential improvements projects within the three

Kurt Bauer, P.E., CFM and Tiffany Clark, P.E., CFM

November 22, 2021

Page 2

watersheds to be considered for inclusion in the MDP analysis. From this list WWE will meet with MHFD, SEMSWA, and other stakeholders to determine which drainage and water quality improvements should be evaluated in the MDP with regard to generating cost estimates and revised modeling efforts.

- Task 3. Evaluate Alternatives and Develop MDP – WWE will evaluate selected alternatives from Task 2 with regard to cost and incorporate into effective hydrologic models to develop a future conditions model. These results will be incorporated into a formal MDP report consistent with MHFD criteria including generation of graphics and mapping. One aspect that we plan to evaluate as a part of this task is the effectiveness of SEMSWA's 20-10 Rule, a topic that we have evaluated at the site scale. As a part of the MDP update, WWE will integrate the findings of our site-level analysis into the hydrologic models for the watersheds. This is expected to provide insight into additional WQCV capacity of SEMSWA's regional ponds, given broad implementation of the 20-10 Rule over more than a decade.
- Task 4. Submit and Address Comments from Review – WWE will submit the draft MDP report and all required supplementary materials to SEMSWA and MHFD for review and approval. Task 4 includes addressing and responding to one round of formal comments from SEMSWA and MHFD.
- Task 5. Project Management and Stakeholder Involvement – This task includes time for project management; internal coordination meetings; check-in calls with the SEMSWA and MHFD; review of tasks, time, and charges; and similar tasks. We have assumed bi-weekly check in meetings over the course of the next year. This task also includes some time for ad hoc meetings as needed with SEMSWA and MHFD and general correspondence not related to Tasks 1 - 4. This task also includes some time for stakeholder outreach. Based on discussions with SEMSWA and MHFD, we will use a virtual outreach strategy. We assume that WWE will assist in providing content for stakeholder outreach. We also have budgeted for developing a simple presentation providing an overview of the master plan update that can be provided to stakeholders and/or SEMSWA management.

WWE has attached a spreadsheet that lists each of these tasks and estimated hours and costs. WWE's estimated budget for this scope of work is \$179,500, including an allowance for direct costs. WWE's standard hourly rate schedule also is attached.

We look forward to kicking this work off in the near future. If SEMSWA or MHFD have any further comments on the proposed scope of work or estimated budget we would be glad to have a meeting to discuss. We really appreciate the opportunity to conduct this work for SEMSWA and MHFD.


Kurt Bauer, P.E., CFM and Tiffany Clark, P.E., CFM

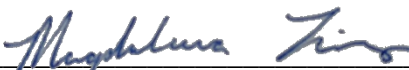
November 22, 2021

Page 3

Sincerely,

WRIGHT WATER ENGINEERS, INC.

By   
Andrew Earles, Ph.D., P.E., D.WRE  
Vice President of Water Resources

By   
Maggie Lewis, P.E.  
Water Resources Engineer

Attachments

Worksheet with Tasks, Hours, and Costs

WWE 2021 Rate Schedule

cc:

Ashley Byerley, SEMSWA, [abyerley@semswa.org](mailto:abyerley@semswa.org)

Tiffany Clark, SEMSWA, [tclark@semswa.org](mailto:tclark@semswa.org)

Laura Hinds, MHFD, [lhinds@mhfd.org](mailto:lhinds@mhfd.org)

Z:\Project Files\21\211-088\211-088.000\Engineering\Proposal and Scope\SEMSWA SW Tribs MDP Update Ltr Proposal 11-22-2021.docx

Major Drainageway Plan Update for Cottonwood, Lone Tree, Windmill, and Dove Creeks (SEMSWA Southwest Tributaries)														
Conceptual Proposed Scope of Work and Estimated Budget														
Staff	Role	Rate	Task 1. Evaluate Current Conditions		Task 2. Develop and Select Alternatives		Task 3. Evaluate Alternatives and Develop MDP		Task 4: Submit and Address Comments from Review		Task 5. Project Management & Stakeholder Involvement		Total	
			Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Earles	Project Manager	\$230	24	\$5,520	24	\$5,520	26	\$5,980	24	\$5,520	60	\$13,800	158	\$36,340
Lewis	Project Engineer	\$149	60	\$8,940	60	\$8,940	80	\$11,920	40	\$5,960	60	\$8,940	300	\$44,700
Wilson	Project Engineer	\$109	80	\$8,720	80	\$8,720	100	\$10,900	60	\$6,540	40	\$4,360	360	\$39,240
Leisure	Wetland Scientist	\$163	40	\$6,520	8	\$1,304	32	\$5,216	8	\$1,304	8	\$1,304	96	\$15,648
Olson	Peer Review	\$197	8	\$1,576	8	\$1,576	16	\$3,152	8	\$1,576	16	\$3,152	56	\$11,032
Nelson	AutoCAD	\$92	0	\$0	40	\$3,680	120	\$11,040	24	\$2,208	0	\$0	184	\$16,928
Waters	Admin	\$95	8	\$760	8	\$760	16	\$1,520	40	\$3,800	8	\$760	80	\$7,600
Subtotals Labor			220	\$32,036	228	\$30,500	390	\$49,728	204	\$26,908	192	\$32,316	1234	\$171,488
Estimated direct costs (plotting, phone, mileage, etc., estimated at 5% of labor subtotal)														\$8,012
Total														\$179,500

**Tasks**

Task 1. Much of Task 1 can build upon work WWE has completed with SEMSWA regarding updating the hydrology for these watersheds and an evaluation of existing and future WQCV demand. For Task 1 WWE will use these studies to determine areas that have been quantified to need stormwater improvements or refinements to previously planned improvements. WWE will also meet with SEMSWA, MHFD, and other stakeholders to identify priority areas for evaluation of the existing site condition, including a discussion of flood history if applicable. Based on these discussions and a review of the existing studies, WWE staff will perform field work to collect information on areas identified as potential improvement projects in the MDP. Field work will also include an evaluation of existing wetland and riparian zones (high level evaluation based on Engenuity stream assessment and National Wetlands Inventory) and will revisit conclusions from 2004 study by WWE for these watersheds that was referenced in the effective MDP. One of the goals of the wetlands assessment will be to identify permits that may be needed to maintain online water quality and detention facilities that may be subject to Section 404 permitting requirements.

Task 2. Based on the findings of the site visit and discussions with stakeholders, WWE will develop a list of potential improvements projects within the three watersheds to be considered for inclusion in the MDP analysis. From this list WWE will meet with MHFD, SEMSWA, and other stakeholders to determine which drainage and water quality improvements should be evaluated in the MDP with regard to generating cost estimates and revised modeling efforts.

Task 3. WWE will evaluate selected alternatives from Task 2 with regard to cost and incorporate into effective hydrologic models to develop a future conditions model. These results will be incorporated into a formal MDP report consistent with MHFD criteria including generation of graphics and mapping. One aspect that we plan to evaluate as a part of this task is the effectiveness of SEMSWA's 20-10 Rule, a topic that we have evaluated at the site scale. As a part of the MDP update, WWE will integrate the findings of our site-level analysis into the hydrologic models for the watersheds. This is expected to provide insight into additional WQCV capacity of SEMSWA's regional ponds, given broad implementation of the 20-10 Rule over more than a decade.

Task 4. WWE will submit the draft MDP report and all required supplementary materials to SEMSWA and MHFD for review and approval. Task 4 includes addressing and responding to one round of formal comments from SEMSWA and MHFD.

Task 5. This task includes time for project management; internal coordination meetings; check-in calls with the SEMSWA and MHFD; review of tasks, time, and charges; and similar tasks. We have assumed bi-weekly check in meetings over the course of the next year. This task also includes some time for ad hoc meetings as needed with SEMSWA and MHFD and general correspondence not related to Tasks 1 - 4. This task also includes some time for stakeholder outreach. Based on discussions with SEMSWA and MHFD, we will use a virtual outreach strategy. We assume that WWE will assist in providing content for stakeholder outreach. We also have budgeted for developing a simple presentation providing an overview of the master plan update that can be provided to stakeholders and/or SEMSWA management.

**Notes and Assumptions**

Task 1 includes two days for field visits by two WWE staff and two formal meeting and presentation with stakeholders (one to receive input on current conditions, goals of MDP, etc. and. The second to present preliminary concepts for alternatives.

The anticipated review process for Task 4 includes a response to one set of comments and one resubmittal to MHFD for the submittal package.



## ACTION ITEM MEMORANDUM

To: CCBWQA TAC  
From: Jessica DiToro, PE, LRE Water  
Date: November 22, 2022  
Subject: Lake Nutrients WQCC Rulemaking Hearing – Delegation of Authority to Board Subcommittee

**Request:** That the CCBWQA TAC recommend a Board subcommittee with authority to make time-sensitive decisions related to minor changes to the CCBWQA's written testimony in submittals for the Lake Nutrients Criteria Rulemaking Hearing (RMH), provided that such changes are substantively consistent with prior direction provided by the Board and TAC.

**Issue:** As directed by the CCBWQA TAC and Board at their respective November CCBWQA meetings, on November 18<sup>th</sup> CCBWQA Technical Manager Jane Clary coordinated with Blake Beyea (Water Quality Control Division [WQCD] Standards Unit Manager) to briefly discuss the CCBWQA's request for a delayed effective date to allow time for development of site-specific standards for Cherry Creek Reservoir. Based on this discussion, the WQCD agreed to provide some additional informal feedback to CCBWQA on the draft RPHS, with initial discussion suggesting that more specificity regarding the site-specific standards approach could be beneficial to CCBWQA's Responsive Prehearing Statement (RPHS).

The next deadline for the RMH is submittal of the RPHS on December 21<sup>st</sup>. The December 1<sup>st</sup> TAC meeting and the December 15<sup>th</sup> Board meeting will be the last regularly scheduled CCBWQA meetings before the RPHS deadline. At the November TAC and Board meetings, both the TAC and the Board approved retracting the CCBWQA's original RPHS that was submitted in August (prior to the hearing schedule changes) and resubmitting a new RPHS with an additional sentence and a brief exhibit with Hydros' memorandum documenting that the CCBWQA reviewed the WQCD's supplemental Proponent's Prehearing Statement (sPPHS) and that this review did not yield any substantially changes to the CCBWQA's request for a delayed effective date.

If additional feedback from WQCD and related discussions identify minor changes that could result in WQCD supporting the Authority's position, Staff would like the ability to make such changes if the timing does not align with the December TAC and Board meetings. To address this potential timing constraint, Staff requests that the TAC recommend that a Board subcommittee be created with the delegated authority to make decisions during time-constrained hearing deadlines and/or make minor edits to hearing documents for the Lake Nutrients Criteria RMH that are substantively consistent with prior direction provided by the Board and TAC.

**Budget:** Participation in this RMH effort is covered under the current CCBWQA regulatory budget for fiscal year 2022 and is also included in the draft budget for fiscal year 2023.

**Recommendation:** The CCBWQA TAC recommends the formation of a CCBWQA Board subcommittee that has authority to make time-sensitive decisions related to minor changes to the CCBWQA's written testimony in submittals for the Lake Nutrients Criteria RMH, provided that such changes are substantively consistent with prior direction provided by the Board and TAC. The CCBWQA TAC recommends the following Directors be on this subcommittee: Topher Lewis, John McCarty, Joshua Rivero, Bill Ruzzo, and John Woodling.

**Next Steps:** Staff will continue to engage with the WQCD as appropriate. At the December 15<sup>th</sup> CCBWQA Board meeting, Staff will bring forward this topic of a Board subcommittee as a Discussion and Action Item. If the Board approves the associated motion, the subcommittee will be utilized as needed.

**Attachment 1**

<b>Lakes Nutrients Criteria (Regulations 31-38) RMH Schedule + CCBWQA Meeting Schedule</b>		
<b>Event</b>	<b>Date</b>	<b>Activity</b>
Nutrient Town Hall	May 2 <sup>nd</sup>	Proposed criteria released by WQCD
May TAC	May 5 <sup>th</sup>	1 <sup>st</sup> discussion related to draft criteria at TAC level
May Board	May 19 <sup>th</sup>	1 <sup>st</sup> discussion related to draft criteria at Board level
June TAC	June 2 <sup>nd</sup>	2 <sup>nd</sup> discussion related to draft criteria at TAC level
June Board	June 16 <sup>th</sup>	2 <sup>nd</sup> discussion related to draft criteria at Board level
July TAC	July 7 <sup>th</sup>	3 <sup>rd</sup> discussion related to draft criteria at TAC level – Motion for Party Status
July Board	July 21 <sup>st</sup>	3 <sup>rd</sup> discussion related to draft criteria at Board level – Motion for Party Status
PPHS	August 3 <sup>rd</sup>	Review WQCD's PPHS
August TAC	August 4 <sup>th</sup>	4 <sup>th</sup> discussion related to draft criteria at TAC level – Motion for RPHS
Party Status Requests	August 17 <sup>th</sup>	Submit Party Status Request
August Board	August 18 <sup>th</sup>	4 <sup>th</sup> discussion related to draft criteria at Board level – Motion for RPHS
September TAC	September 1 <sup>st</sup>	5 <sup>th</sup> discussion related to draft criteria at TAC level – Discuss Rebuttal
September Board	September 15 <sup>th</sup>	5 <sup>th</sup> discussion related to draft criteria at Board level – Motion for Rebuttal if needed
Supplemental PPHS	October 5 <sup>th</sup>	Review WQCD's Supplemental PPHS
October TAC	October 6 <sup>th</sup>	6 <sup>th</sup> discussion related to draft criteria at TAC level – Update on status
October Board	October 20 <sup>th</sup>	6 <sup>th</sup> discussion related to draft criteria at Board level – Update on status
November TAC	November 3 <sup>rd</sup>	7 <sup>th</sup> discussion related to draft criteria at TAC level – Discuss RPHS
November Board	November 17 <sup>th</sup>	7 <sup>th</sup> discussion related to draft criteria at Board level – Motion for RPHS
<b>December TAC</b>	<b>December 1<sup>st</sup></b>	<b>8<sup>th</sup> discussion related to draft criteria at TAC level – Discuss Board Subcommittee</b>
<b>December Board</b>	<b>December 15<sup>th</sup></b>	<b>8<sup>th</sup> discussion related to draft criteria at Board level – Motion for Board Subcommittee</b>
<b>RPHS</b>	<b>December 21<sup>st</sup></b>	<b>Submit Supplemental RPHS – TBD + Review other parties' RPHSs</b>
<b>January TAC</b>	<b>January 5<sup>th</sup></b>	<b>9<sup>th</sup> discussion related to draft criteria at TAC level – Discuss Rebuttals</b>
<b>January Board</b>	<b>January 19<sup>th</sup></b>	<b>9<sup>th</sup> discussion related to draft criteria at Board level – Motion for Rebuttals(?)</b>
<b>February TAC</b>	<b>February 2<sup>nd</sup></b>	<b>10<sup>th</sup> discussion related to draft criteria at TAC level – Update on status</b>
<b>Rebuttals</b>	<b>February 15<sup>th</sup></b>	<b>Submit Rebuttal Statement – TBD + Review other parties' Rebuttals</b>
<b>February Board</b>	<b>February 16<sup>th</sup></b>	<b>10<sup>th</sup> discussion related to draft criteria at Board level – Update on status</b>
<b>Motions</b>	<b>February 22<sup>nd</sup></b>	<b>TBD</b>
<b>Complex Outstanding Issues Index</b>	<b>March 1<sup>st</sup></b>	<b>Review Index</b>
<b>March TAC</b>	<b>March 2<sup>nd</sup></b>	<b>11<sup>th</sup> discussion related to draft criteria at TAC level – Discuss RMH Presentation</b>
<b>Prehearing Conference</b>	<b>March 7<sup>th</sup></b>	<b>Participate (virtually) in conference to maintain Party Status</b>
<b>March Board</b>	<b>March 16<sup>th</sup></b>	<b>11<sup>th</sup> discussion related to draft criteria at Board level – Motion for RMH Presentation</b>
<b>Negotiation Cutoff</b>	<b>March 16<sup>th</sup></b>	<b>Final negotiations with WQCD and other parties today</b>
<b>Consolidated Proposal</b>	<b>March 30<sup>th</sup></b>	<b>Review Proposal</b>
<b>Cost Benefit Analysis</b>	<b>March 31<sup>st</sup></b>	<b>Review Cost Benefit Analysis</b>
<b>Regulatory Analysis</b>	<b>April 5<sup>th</sup></b>	<b>Review Regulatory Analysis</b>
<b>April TAC</b>	<b>April 6<sup>th</sup></b>	<b>12<sup>th</sup> discussion related to draft criteria at TAC level – Update on status</b>
<b>RMH</b>	<b>April 10<sup>th</sup></b>	<b>Participate (virtually) in RMH</b>
<b>April Board</b>	<b>April 20<sup>th</sup></b>	<b>Update on RMH outcome</b>
<b>May TAC</b>	<b>May 4<sup>th</sup></b>	<b>Update on RMH outcome</b>



Cherry Creek Basin Water Quality Authority							
Land Use Referral Summary							
Prepared:	November 10, 2022						
November yielded 19 reviews to date, down from 23 in October. 10 were commercial, 6 were residential, 2 were mixed use, and 1 was utility.							
Nov-22							
Referral Agency	Proposed Development	Type of Land Use	Date Received	Review Deadline	Approx. Dev. Size (acres)	Review Date	Comments
Douglas County	Cielo Metropolitan District Service Plan, 2nd Amendment	Mixed Use	11/1/2022	11/15/2022	0	11/9/2022	No exceptions taken with the proposed service plan amendment
Douglas County	Mirabelle Metropolitan District Nos. 1-4 Consolidated Service Plan, 2nd	Mixed Use	11/1/2022	11/15/2022	0	11/9/2022	No exceptions taken with the proposed service plan amendment
City of Aurora	CATTLEMENS AT EAGLE BEND FLG #01	residential	11/1/2022	11/4/2022	9.1	11/3/2022	Previously Reviewed 2330, 2400,2417 & 2452 No exceptions taken with the signature set
Town of Parker	Parker Pointe F1 L13 - McDonald's Site Plan	commercial	11/2/2022	12/5/2022	1.5	11/11/2022	1.The Authority's Control Regulation 72 requires construction and post-construction Best Management Practices (BMPs). 2. No exceptions taken with the proposed post construction BMPs. 3. For Construction BMPs, the CBMP plan only shows silt fence as a perimeter control along Parker Road (west), how will controls limit runoff to Napa Avenue?
SEMSWA	South Denver Islamic Center	commercial	11/2/2022	11/23/2023	3	11/14/2022	1.The Authority's Control Regulation 72 requires construction and post-construction Best Management Practices (BMPs). 2. No exceptions taken with the proposed post construction and Construction BMPs.
City of Centennial	Smoky Hill Kum & Go (24-hour)	commercial	11/4/2022	12/7/2022	1.55	11/15/2022	1.The Authority's Control Regulation 72 requires construction and post-construction Best Management Practices (BMPs). 2. No exceptions taken with the proposed post construction BMPs. 3. When construction BMPs (GESC plan) are available, please provide for our review and comment.
Town of Parker	Parker Task Force L1 - Addition to Existing Building	commercial	11/7/2022	12/5/2022	2.6	11/18/2022	1.This project is within the Cherry Creek Basin and therefore subject to the CCBWQA (Authority's) Control Regulation 72. CR72 requires construction and post-construction Best Management Practices (BMPs). 2. It appears this project will meet Tier 3 designation per CR72 (>5000sf of added imperviousness) and will therefore require post construction BMPs meeting Tier 3 requirements (treatment of the Water Quality Capture Volume). It does not appear treatment of the WQCV is being provided, please provide more information of how this site will meet CR72 regulations. 3. No exceptions taken with the construction BMPs.
City of Centennial	Vermillion Creek Site Plan Phase 1	commercial	11/8/2022	11/22/2022	93.9	11/21/2022	1.This project is within the Cherry Creek Basin and therefore subject to the CCBWQA (Authority's) Control Regulation 72. CR72 requires construction and post-construction Best Management Practices (BMPs). 2. No exceptions taken with the proposed Full Spectrum Detention for post construction BMPs. However, it appears development will encroach in the existing defined "stream preservation area" and will be subject to the additional BMP requirements per CR72 (See section 72.7-2.(c)(8)(i)) 3. Construction BMPs were not provided for review, this project should note the requirements of CR72 phased construction (Section 72.7-2.(b)(5)(i)(A.) "Areas of Land Disturbance equal to 40 acres or greater must not be exposed for more than 30 consecutive days without temporary or permanent stabilization."
Town of Parker	Tanterra F8	residential	11/9/2022	12/13/2022	153	11/21/2022	1.The Authority's Control Regulation 72 requires construction and post-construction Best Management Practices (BMPs). 2. No exceptions taken with the use of full spectrum detention for post construction BMPs. However the final report for design of these features should be provided for review. 3. Civils CD files would not open from Trakit site (possibly related to file size). Construction Plans and Construction BMPs were not able to be reviewed. This project should note the requirements of CR72 phased construction (Section 72.7-2.(b)(5)(i)(A.) "Areas of Land Disturbance equal to 40 acres or greater must not be exposed for more than 30 consecutive days without temporary or permanent stabilization."
Town of Parker	Tanterra F9	residential	11/9/2022	12/13/2022	12.6	11/21/2022	1.The Authority's Control Regulation 72 requires construction and post-construction Best Management Practices (BMPs). 2. No exceptions taken with the use of full spectrum detention for post construction BMPs. However the final report for design of these features (by Muller) should be provided for review. 3. Civils CD files would not open from Trakit site (possibly related to file size). Construction Plans and Construction BMPs were not able to be reviewed. This project should note the requirements of CR72 phased construction (Section 72.7-2.(b)(5)(i)(A.) "Areas of Land Disturbance equal to 40 acres or greater must not be exposed for more than 30 consecutive days without temporary or permanent stabilization." This shall be considered with total disturbance for overall development.
Castle Pines	Parkway Plaza Planned Development	commercial	11/14/2022	12/5/2022	10		
Douglas County	Meridian Office Park Filing 1, 2nd Amendment, Most of Tract D (Meridian Water Campus – Potable Water Treatment Plant)	Other - Utility	11/14/2022	11/28/2022	25.8		
City of Aurora	Pioneer Hills F12	commercial	11/15/2022	11/29/2022	0.7		Previously Reviewed 2275
Town of Parker	Tanterra F10	residential	11/18/2022	12/20/2022	8.4		
Town of Parker	Tanterra F11	residential	11/18/2022	12/20/2022	18.9		

SEMSWA	Vermillion Creek - Phase 1 Site plan and Plat	residential	11/18/2022	12/5/52022	93.9		
Douglas County	Inverness Filing 7, 6th Amendment, Lot 2, 1st Revision	commercial	11/18/2022	12/9/2022	12.9		
Arapahoe County	Waste Management	commercial	11/18/2022	12/14/2022	161	11/21/2022	Outside CCBWQA Limits
Douglas County	Highfield Business Park, Lot 4.	commercial	11/21/2022	12/14/2022	4.7		

**CHERRY CREEK BASIN WATER QUALITY AUTHORITY**  
**2022 Capital Project, Maintenance, and Planning Status Report**  
November 28, 2022

**RESERVOIR PROJECTS**

1. Reservoir Destratification System (RDS)– Distribution System Concepts (CCR-2)
  - a. Description: The RDS in-lake distribution system consists of several lines and 116 membrane disc diffusers that create the bubble plumes to help mix the reservoir and improve water quality. The RDS reduces the chlorophyll a in the reservoir. The RDS was originally installed in 2008. The in-lake distribution which has been requiring increased maintenance in 2019-2021, which is indicating that replacement may be needed within the 10-year CIP window. In January 2020, Wright Water Engineers (WWE) evaluated in-lake treatment in the Reservoir included an expansion of existing destratification system. This project evaluates the replacement and/or upgrade of the distribution system and informs cost and timing of the work.
  - b. Status: Project is waiting on watershed model runs, at which time it will be brought back to TAC and Board for further discussion, input, and direction (3/31/22).
2. Reservoir Nutrient Mitigation Alternatives Study (CCR-3)
  - a. Description: Nutrients in the Reservoir fuel the chlorophyll a level. In January 2020, Wright Water Engineers (WWE) evaluated in-lake treatment in the Reservoir. In 2021, Solitude Lake Management performed a sediment sampling and testing in the Reservoir. This study combines this recent work with CCBWQA's ongoing water quality sampling in the reservoir and the reservoir model, to inform options to reduce nutrients in the reservoir and refine their viability.
  - b. Status: *Alternatives study has been moved to 2024 pending feasibility and modeling results.*
3. 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.*

**STREAM RECLAMATION PROJECTS**

1. Cherry Creek Monitoring Station CC-10, Flow Measuring Improvements (CCB-5.13)
  - a. Description: This project was identified in 2019 as part of the exploration of the downcut area and through the flow analysis with during the reservoir and watershed modeling effort. It installs equipment upstream of the perimeter road that would be used to measure the flow

- that splits off to the west and bypasses the CC-10 and provide a new rating curve at CC-10 to improve measurements of high flow at this location.
- b. Status: RESPEC provided scope of work and fee for the engineering and survey work needed, and it was approved by the Board at their April 2020 meeting. Survey is scheduled for 5/29/20. Survey is complete. Updated rating curves are scheduled to be delivered by late September. Received update from RESPEC that information is under Quality Assurance and Quality Check review and will be submitted soon (10/8/20). RESPEC's draft memo was received on 12/4/20 and comments have been returned. A meeting was held with Erin, Chuck, Chris, and Rich on 12/16/20 to discuss measuring station improvements and scheduling. A tour with Jason Trujillo was held on 2/12/21, no fire damage was noted on CC-10. A stage gage will be added upstream of Lake View Drive to allow for flow measurement of flows that bypass CC-10 and go directly to Cherry Creek reservoir (3/12/21). Work order has been prepared to Hydrologik for stage measurement at Lake View Drive (4/13/21). Hydrologik has installed the stage measurement at Lake View Drive and RESPEC has submitted the Final Draft of the Rating Curve and it is currently under review (8/13/21). Comments on report have been provided to RESPEC (11/11/21). Additional analysis on rating curve for CC10 was done to determine effects of reservoir level (3/31/22). RESPEC prepared a detailed rating curve for Lake View Drive which will facilitate flow comparison between CC10 and Lake View Drive (5/13/22).
2. 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, and 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.
  3. Cherry Creek Stream Reclamation at 12-Mile Park – Phase 3 (CCB 5.16A)
    - a. Description: The design contract with CH2M Hill was executed on November 27, 2018. Notice to proceed included only those services defined as Phase 1 in CH2M Hill's scope of services. As part of the approved Action Item Memo to the Board, staff recommended that a design review committee consisting of the Capital Projects Manager and up to three TAC members be established. The not-to-exceed fee totals \$104,991.88; with the Part 1 services not-to-exceed fee of \$45,078.88, and the Part 2 services not-to-exceed fee of \$59,913.00. The design review committee is David Van Dellen, Jacob James, Casey Davenhill, Bahman Hatami/Jon Erickson, and Richard Borchardt. CH2M Hill is now Jacobs.
    - b. Status: Jacobs is starting data collection for topographic survey and wetland mapping. Survey is scheduled to start 2/28/19 and is coordinated with Colorado State Parks. Survey has been completed and wetland mapping is underway. Jacobs has prepared updated schedule to account for weather delays on surveying and wetland mapping. The design kickoff meeting was held on 5/15/19. Jacobs is preparing concepts and costs for 4 alternatives. A field visit and progress meeting are scheduled for 8/8/19. Jacobs presented alternatives and costs to the design review committee on 8/8/19. Jacobs and the design review committee are preparing a presentation on alternatives and costs for the TAC (9/5/19 and 10/3/19) and Board (10/17/19). Received authorization from Board at 10/17/19 meeting to move project forward in 2 phases; Jacobs is working on scope of work adjustments needed for this approach. Final design of phase 3A (protects existing work done in phases 1

and 2) and permit level design of Phase 3B (adaptive approach downstream of breach area) are underway. A progress meeting was held on 1/30/20; design on Phase 3A is about 30% complete. The initial site visit with the Army Corps of Engineers has been cancelled due to stay at home orders, approach has changed to supplying them a draft of the materials and addressing questions and comments. Progress meeting and site visit to look at Phase 3B was held on 6/1/20. Scope of work and fee for adaptive management and preliminary design of Phase 3B is under review by committee. A joint Cherry Creek Committees meeting is scheduled for 10/5/20 to discuss optimization between the Cherry Creek 12-mile Phase 3B project and the Cherry Creek Reservoir to Park Boundary study. Phase 3A was submitted to the US Army Corps of Engineers for their 408 review on 11/4/20. Construction BMPs plan and report were reviewed and approved by Arapahoe County on behalf of Cherry Creek State Park on 12/22/20. Jacobs submitted draft Scope of Work (draft SOW) for the optimization for Phase 3B (north of breach repair) for adaptive management approach; the joint committee meeting is schedule for 2/3/21 to review SOW. A meeting is scheduled with USACOE's new contact Bobbi Jo Trout for CCBWQA on 2/1/21 where a status update on the 408 review will be requested. The Joint Cherry Creek Committees recommended holding off on Jacobs draft SOW, as the scope and scale of adaptive management may evolve with Muller's Study of the area between Reservoir and the Park Boundary; Bobbi is checking on status of 408 review (2/11/21). A site visit with Bobbi and Jason was held on 4/26/21 to help facilitate the USACOE's 408 review. A site visit with the Cherry Creek subcommittee was held on 6/24/21, plan modifications associated with additional erosion from spring 2021 runoff and Muller's study work on Cherry Creek are being evaluated by the Cherry Creek subcommittee. A coordination meeting was held on 7/12/21 with Jacobs and Muller to discuss updating the location cutoff wall and layout (based on the erosion from the 2021 Spring runoff and the Muller's geomorphic and 2D modeling effort); Jacobs is preparing exhibits for subcommittee's discussion and consideration (7/29/21). The subcommittee met on 8/12/21 and provided Jacobs direction on cutoff wall location and plan revisions. Revised plans and engineer's opinion of probable construction cost has been sent to project committee (11/11/21). Board is considering the release of the project to Bid (12/9/21). Board authorized project for bidding with the base bid and add alternate at their December 2021 meeting. We received confirmation that plan revisions made are still in conformance with 408 approval; are waiting for response regarding revisions and the 404 permit; received approval on GESC plans and report (12/30/21). CCBWQA received concurrence on conformance with existing 404 permit and project is out for bid (1/13/22). The project is out to bid and the pre-bid meeting was held on 1/28/22. CCBWQA received 10 bids on 2/4/22; the low bidder is 53 Corporation. Notice of Award has been issued to 53 Corporation (3/10/22). Construction Agreement has been executed (3/31/22). The pre-construction meeting was held on 4/6/22 with construction scheduled to start on 4/25/22. Construction is underway (5/13/22). Construction is nearing completions with the final walk-through was held on 6/14/22. Project is substantially complete and is waiting for seeding and planting window to complete willow staking and touch up seeding (7/15/22). Jacobs is scheduled to do a site visit on 9/9/22 to evaluate post-storm condition and recommend repairs needed because of the 8/15/22 storm. Repairs are minor and are being scheduled with 53 Corporation (10/13/22). Visited site with 53 Corporation on 11/2/22.

4. 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).

5. 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).
  
6. McMurdo Gulch 2020/2021/2022 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 project and the improves the next set of high priority areas about 2,500 feet. The Authority's water quality component share for design and construction is estimated to be \$360,000 (\$60,000 for design in 2020, and \$300,000 for construction in 2021). The total project cost is estimated at \$1,440,000.
  - b. Status: 2020 Funding was approved at June Board Meeting and capital budget restructure will be drafted for future consideration. 60% level progress meeting is scheduled for 10/5/20. Review comments on 60% submittal were provided on 10/6/20. 90% design submittal is scheduled by end of March (3/12/21). 90% design submittal is being reviewed (4/8/21). CCBWQA submitted comments on 90% design on 4/13/21. The 90% design review and progress meeting was held on 7/22/21, and the construction funding for project is being considered by the TAC at their August meetings (7/29/21). The IGA is currently be drafted and will be brought to the Board at their September meeting (8/13/21). The project is being bid by Castle Rock with the bid opening scheduled for 11/12/21. Tezak Construction was the apparent low bidder (12/9/21). The pre-construction meeting was held on 1/3/22. Construction is underway (2/11/22). A construction meeting was held on 3/8/22, with sites 1-3 have the general construction completing and are waiting for a revegetation window and site 4 has started work on riffle structure. Seeding and revegetation are underway during spring planting window (5/13/22). *Visited site on 11/22/22, construction appears complete and vegetation establishment has begun.*
  
7. 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.*

8. 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).
9. 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.*
10. 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.

11. 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.

## **MAINTENANCE**

1. Reservoir Destratification Operations (OM-7)
  - a. Description: Includes 2022 Annual Operations and Maintenance of the Reservoir Destratification System (RDS).
  - b. Status: Ingersoll Rand replaced the top pressure regulating valve on 4/4/22; the pre-season check was done simultaneously, and no leaks were observed. The RDS was started for the season on 5/1/22. At the request of Colorado Parks and Wildlife (CPW) to aid in search and recovery efforts the RDS was turned off on 5/10/22 and it will be started back up when notified by CPW that it is appropriate. The RDS was restarted on 5/14/22. Ingersoll Rand preformed compressor maintenance on 6/14/22 and B&RW repaired a leaky diffuser head on 6/22/22. Annual maintenance on the in-lake distribution system started on 8/22/22 and 8/23/22 with the remaining maintenance scheduled for the end of September. Compressor shut down with a high temperature warning on 9/2/22; the Ingersoll Rand technician responded on 9/7/22, cleaned out coolers, and restarted compressor. A leak in the reservoir distribution was observed on 9/15/22, the affected zone 1 was turned off until repairs can be made, repairs were completed on 9/27/22 and zone 1 was turned back on then. Annual maintenance continued the week of 10/3/22 and when it was completed the system was turned off for the season on 10/6/22.
2. PRF Weed Control (OM 14.1)
  - a. Description: Includes 2022 weed control from 2021 Annual Observation of Pollution Reduction Facilities (PRFs).
  - b. Status: No weed control was performed in 2022.
3. PRF Reseeding at CCSP (OM 14.2)
  - a. Description: Includes 2022 routine restoration of PRF vegetation at Cherry Creek State Park (CCSP) from 2021 Annual Observation of Pollution Reduction Facilities (PRFs).
  - b. Status: No seeding was performed in 2022.
4. 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).
5. East Boat Ramp Shoreline Stabilization Phase II (OM 4.6)



- a. Description: This project was identified in through the 2012 annual inspection and design and permitting started in 2019. It connects to the Phase I project and extends shoreline protection 100 feet to the north towards the East Shade Shelters.
  - b. Status: Field work has been completed on the East Boat Ramp Shoreline Stabilization and design is underway. Permitting Meeting was held on 9/16/19. ERO has been contracted to for 404 permitting assistance. Preliminary Design was completed on the East Boat Ramp in December 2019; permitting and final design has begun. Design is about 80% complete. Site meeting with Colorado Parks and Wildlife was held on 3/25/20. ERO has prepared 404 permit application on 4/30/20. 404 permit application has been submitted. East Boat Ramp Plans were submitted on 8/26/20 to USACOE and Cherry Creek State Park staff for their review and approval. USACOE's 408 approval was received and final bid documents are being prepared (1/29/21). Contract Documents are being updated for Bidnet (5/27/21). GESC is being prepared (11/11/21). GESC was submitted to Arapahoe County for review (1/13/22). Project is out for bid (5/13/22). The pre-bid meeting was held on 5/25/22. The bid opening was on 6/8/22 with 53 Corporation being the low bidder. The Board authorized the award to 53 Corporation and the construction funding at their June 16<sup>th</sup> meeting (6/30/22). 53 Corporation started construction on 8/22/23. Project is nearing completion and final walk-through was held on 10/4/22. Construction is complete (11/11/22).
6. 2021 Wetland Harvesting Pilot Project (OM WHPP)
- a. Description: Includes 2021 Wetland Harvesting on Cottonwood Creek (Western Bank) to remove Phosphorus and Nitrogen. Harvesting cuts the above ground biomass, collects and hauls off cuttings effectively removing the Phosphorus and Nitrogen trapped in the cuttings. The preserved below ground biomass will regenerate and regrow, creating a sustainable harvesting program that retains the natural and beneficial functions of the wetlands.
  - b. Status: The Board authorized Wetland Harvesting Pilot Project at their March 2021 meeting (8/13/21). The Pilot Project started on 10/11/21, a site visit was made on 10/13/21, and is scheduled to be completed by 10/31/21. Field work has been completed (11/11/21). Lab data is being compiled (12/9/21). LRE Water is preparing a google earth and GIS boundaries of 2021 harvest limits (12/30/21). Lab data on vegetation samples was received and nutrient removal information from 2021 harvesting is being developed (1/28/22). The 2021 update and data were presented to TAC at their 4/7/22 meeting. Presentation of 2021 Update is scheduled for the May Board meeting (5/13/22). An update on the regrowth of the 2021 Harvest Area will be provided at the 8/18/22 Board Meeting and 9/1/22 TAC Meeting.
7. 2022 Wetland Harvesting Pilot Project (OM WHPP)
- a. Description: Includes 2022 Wetland Harvesting on Cottonwood Creek (Eastern Bank) to remove Phosphorus and Nitrogen. Harvesting cuts the above ground biomass, collects and hauls off cuttings effectively removing the Phosphorus and Nitrogen trapped in the cuttings. The preserved below ground biomass will regenerate and regrow, creating a sustainable harvesting program that retains the natural and beneficial functions of the wetlands.
  - c. Status: Action for 2022 is scheduled for the May Board meeting (5/13/22). The Board authorized the wetland harvesting work for 2022 (5/27/22). L&M is preparing proposal for 2022 wetland harvesting (8/12/22). The 2022 wetland harvesting is scheduled from 9/12/22 to 9/23/22 (8/26/22). The 2022 wetland harvesting has been completed; lab results of samples, area measurement, and final weights of harvesting are in progress (10/13/22).

## **PLANNING**

- 1. Cherry Creek Master Plan Cherry Creek State Park Boundary upstream to the Mile High Flood District Boundary (PAPM-0)
  - a. Description: The Mile High Flood District (MHFD), Southeast Metro Stormwater Authority, Town of Parker, Douglas County, and CCBWQA are preparing a Major Drainageway Planning Study for Cherry Creek upstream of Cherry Creek Reservoir. The Plan identifies potential Pollution Abatement Projects (PAPs). Potential PAPs are stream reclamation (immobilizes phosphorus in soil).

- b. Status: Muller Engineering has been selected as the consultant for the project and their scope of work and fee and currently under review by the project sponsors. Field visits by the consulting team started on 10/8/20 and were completed on 11/6/20. Progress meeting was held on 12/14/20, which included overview of field visits. At the 2/8/21 progress meeting, a water quality parametric was discussed, and could be mapped and used to identify deficiencies along Cherry Creek. Muller is scheduled to present at TAC at the 5/6/21 TAC meeting, and the 2021 Water Quality Planning Scope of Work and Fee will be considered at CCBWQA's May TAC and Board meetings (4/30/21). Muller provided update and 2021 Water Quality Planning work was authorized (5/27/21). A progress meeting was held on 10/11/21. Muller has added a water quality parametric to the overall stream assessment exhibit and is working with RESPEC to include information from watershed model (12/30/21). A draft storyboard of the work was presented at the progress meeting on 4/11/22. Water Quality text for StoryMap/WebPlan submittal is scheduled for mid-August (7/15/22). Received water quality submittal on 8/26/22 and it is being reviewed (9/8/22). Muller is incorporating final comments and presented story map at the 9/23/22 Cherry Creek Stewardship Conference. *Study has been completed (11/28/22).*
2. Cherry Creek Tributaries Major Drainageway Planning (PAPM-1)
- a. Description: The Mile High Flood District (MHFD), City of Aurora, Southeast Metro Stormwater Authority, and Douglas County are preparing a Major Drainageway Planning Study for Cherry Creek Tributaries upstream of Cherry Creek Reservoir and Dewberry / J3 is the consultant. The tributaries included are Little Raven Creek, Suhaka Creek, Joplin Tributary, Grove Ranch, Valley Club Acres, North Arapahoe Tributary, South Arapahoe Tributary, Chenango Tributary, Tagawa Tributary, Kragelund Tributary, and 17-mile Tributary. This project identifies potential Pollution Abatement Projects (PAPs) within the Cherry Creek Tribs MDP and the areas of those tributaries in CCSP. Potential PAPs are stream reclamation (immobilizes phosphorus in soil) and water quality treatment within detention basins (settlement of sediments and attached phosphorus).
- b. Status: Board authorized CCBWQA to enter into Agreement with Dewberry at their 2/20/20 meeting, and CCBWQA contracted with Dewberry. Dewberry conducted field work 4/28-4/30/20. Dewberry will continue CCBWQA's work in conjunction with hydrology and alternatives in MHFD master plan. Dewberry has submitted the Alternatives Memo which is being reviewed (10/15/21). Comments have been provided on Alternatives Memo (12/9/21). Dewberry is working on the grading of the proposed water quality ponds (6/10/22). Study progress meetings were held for 17-mile Tributary on 8/15/22 and Kragelund Tributary on 8/22/22. A study progress meeting was held for Chenango Tributary on 9/2/22. The draft alternatives analysis was submitted on 10/26/22 and is under review.
3. Cherry Creek Stream Planning and Approach Study Reservoir to 12-Mile Park (BAPM-1)
- a. Description: Several issues and concerns exist on Cherry Creek between the reservoir and 12 -mile Park: the continued head cut erosion and fallen and dying trees, CCBWQA's CC-10 monitoring station's declining accuracy and reliability of flow measurements, Bank and bed erosion along Cherry Creek from Perimeter Road to downstream, and the change in flow path downstream of the Cherry Creek 12-mile Park Phase 2 project (Breach Area). This study will help determine the water quality implications of these issues, CCBWQA's approach and role in the area, and stake-holders and possible partners.
- b. Status: Interim committee is being set up to negotiate with Muller and determine scope of work, fee, and deliverables for TAC and Board consideration. Interim committee consists of Bill Ruzzo, John McCarty, Jon Erickson, Jason Trujillo, Rich Borchardt, and Chuck Reid. The scoping meeting is scheduled for 3/30/20. Muller conducted field assessment work on 4/28/20. Drone video is pending permit approval by USACOE. Muller has submitted draft base scope of work and optional additional services, which are being reviewed and considered by interim committee at their next meeting on 5/4/20. The next scoping meeting with interim committee and Muller is scheduled for 5/15/20; with a final draft of scope and fee being prepared for consideration shortly afterwards. Muller's scope of work and fee were distributed to TAC and Board authorized design services at their April 2020 meeting. Muller's

revised scope and fee is being reviewed by committee. The study committee of John McCarty, Bill Ruzzo, Jacob James, Lanae Raymond, David VanDellen, and Jon Erickson has been formed to assist with decisions and direction during study. The kickoff meeting was held on 8/11/20. A joint Cherry Creek Committees meeting is scheduled for 10/5/20 to discuss optimization between the Cherry Creek 12-mile Phase 3B project and the Cherry Creek Reservoir to Park Boundary study. Muller is preparing draft scope of work for the optimization approach (11/12/20). Muller has submitted the draft scope of work and fee for the optimization approach on 12/9/20. Muller revised draft Scope of Work (draft SOW) for the optimization to include sub-consultant work; the joint committee meeting is schedule for 2/3/21 to review draft SOW. The Joint Cherry Creek Committees and TAC have reviewed the draft SOW, and the final version is being included for Board consideration at their February Board Meeting (2/11/21). The Board approved Muller's Optimization work at their February Board Meeting (2/26/21). Muller plans to provide an update at July TAC meeting (4/30/21). Muller provided a draft submittal of historical site information and the survey efforts on 5/24/21. Muller will provide an update at the July TAC and Board Meetings (6/25/21). Please submit any comments on Draft report to Rich by 8/20/21 (7/29/21). Muller's additional scope of work for workshops and partnering efforts are scheduled was authorized by the Board in September (10/15/21); amendment to Muller's contract has been executed (11/11/21). It is anticipated that the workshop will be held in 2022 (12/30/21). Muller submitted the water quality assessment report on 4/9/22 which is currently being reviewed by the Pollution Abatement Project Manager. Comments on water quality study and monitoring have been sent to Muller (5/27/22). Muller is revising study to include comments (7/15/22). Muller has submitted revised channel monitoring report on 9/8/22. Muller has submitted the revised stream assessment report on 10/10/22. *Muller revised reports and resubmitted them on 11/21/22; reports will be taken to TAC and Board in December with a proposed workshop for consideration.*



RIFFLES TO RIPPLES

## MEMORANDUM

---

**DATE:** November 1, 2022 (Revised to include TAC input on November 4, 2022)

---

**TO:** Jacob James, P.E.; Cherry Creek Basin Water Quality Authority (CCBWQA) – Technical Advisory Committee (TAC) Chairman  
Jane Clary, Wright Water Engineers, CCBWQA Technical Manager

**CC:** Jason Trujillo, Cherry Creek State Park (CCSP) Park Manager

**FROM:** Richard G. Borchardt PE, CFM

**SUBJECT:** 2022 Annual Field Observation of Pollution Reduction Facilities (PRFs) at CCSP

---

### Introduction

Annually, the CCBWQA performs Field Observation of the PRFs constructed by the CCBWQA at CCSP. The annual Field Observation is a requirement of the Operations and Maintenance Agreement between the CCBWQA and CCSP dated January 14, 2006 (Agreement). The West Boat Ramp PRF was excluded from the Agreement by the First Amendment dated April 18, 2013 (Amendment).

The purpose of the Field Observation is to assess whether the PRFs are functioning as designed and to identify routine, restorative, and rehabilitative maintenance requirements. The TAC of the CCBWQA will use this report to provide recommendations to the Board for the following fiscal year budgeting of maintenance activities. Restorative and rehabilitative maintenance requirements are the responsibility of the CCBWQA. Routine maintenance is the responsibility of CCSP. Other items, such as educational/interpretive sign replacement and weed control, as outlined in the Agreement, are shared 50% by CCSP and 50% by CCBWQA. The West Boat Ramp PRF’s routine, restorative, and rehabilitative maintenance responsibility is 100% CCSP and/or the Marina.

As defined in the Agreement, the term “Restorative and Rehabilitative Maintenance” shall mean all maintenance and repair reasonably necessary to keep the structural and other essential components or portions of a PRF in good working order and functioning as designed, including but not limited to the repair of walls, embankments, pipes, gates, monitoring facilities, erosion and riprap, the removal of sediment, and the replacement of vegetation within the disturbed area of a PRF as needed to maintain or restore the PRF’s function. “Routine Maintenance” shall mean any and all maintenance that is necessary (other than Restorative and Rehabilitative Maintenance) to keep a PRF in a clean, visually appealing and safe condition, free from debris and rubbish, and protected from vandalism and malicious mischief to the same extent as any other public facility located within the CCSP.

The PRFs that are part of the Stream and Drainage System are observed at least annually and after storm events since they are more likely to have changes in their condition. The PRFs that are Shoreline Stabilization are observed on an as needed basis or as the CCBWQA, CCSP and/or United States Army Corps of Engineers personnel identify issues or concerns during the year. The Field Observation frequency by PRF is shown in **Table 1**. The Cherry Creek at 12-mile Park (Phase III) PRF was substantially complete in 2022 and therefore was added to **Table 1**.

PRFs Field Observation Annually and After Significant Storm Events (Part of Stream and Drainage System)	PRFs Field Observation As-Needed (Part of Shoreline Stabilization)
Shop Creek Cherry Creek at 12-Mile Park (Phases I and II) Cherry Creek at 12-Mile Park (Phases III) Cottonwood Creek Stream Reclamation Cottonwood Wetlands Quincy Drainage West Boat Ramp	Tower Loop East Shade Shelters East Boat Ramp Dixon Grove Mountain and Lake Loop

**Table 1 – Frequency of Field Observation by PRF**

The CCSP brochure map (**Figure 1**) is included for reference and shows general vicinity of PRFs.

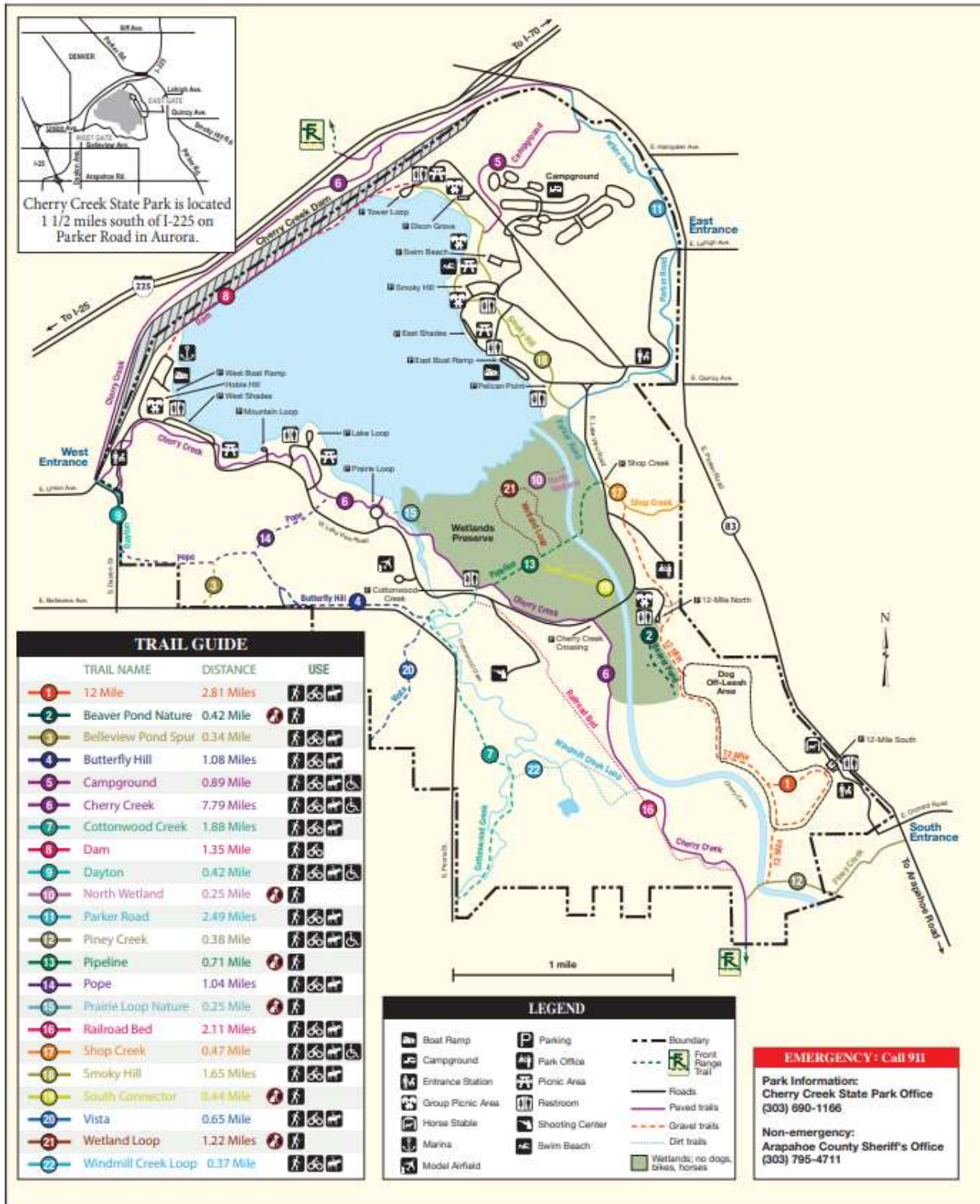


Figure 1 - CCSP brochure map

In 2022, all PRFs were observed. The Field Observation was performed in July and August. A coordination meeting with Colorado Parks and Wildlife (Claudia Mead and Jonathan Kingery) occurred on August 2, 2022.

On August 15-16, 2022, there was a significant storm event (see storm photos on right and following page courtesy of Erin Stewart with LRE Water). This storm event necessitated post-storm visits of the Cherry Creek 12-mile Park (Phases I, II, and III), the Cottonwood Creek Stream Reclamation, and Cottonwood Wetlands, as those were the primary PRFs that saw increased runoff from this storm event.



**Storm Photo - Cherry Creek at CC10**



**Storm Photo - Cottonwood Creek at CT-P1**



**Storm Photo - Cherry Creek at Lake View Drive**

### **General Assessments**

The 2022 annual Field Observation general assessments and photos are provided on the following pages. The post-storm findings and photos have been included for the Cherry Creek 12-mile Park (Phases I, II, and III), the Cottonwood Creek Stream Reclamation, and Cottonwood Wetlands PRFs.



West Boat Ramp (Reservoir Water Surface Elevation = 5547.7 on 7/28/22): Construction of this PRF was completed in 2014. All maintenance for this PRF is the responsibility of CCSP. Routine maintenance is needed to clear woody vegetation (**Photo 1**). At the 8/2/22 meeting with CCSP, CCSP staff marked limits of the spillway with paint and will coordinate with Marina and associated groups to relocate items currently stored there to another location (**Photo 2**). Maintenance that was identified for CCSP is cutting and clearing of vegetation around outlet and relocating stored items outside of spillway.

**Photo 1 - 7/28/22**



**Photo 2 - 7/28/22**



**Cottonwood Wetlands:** Some woody vegetation was observed around outlet (**Photo 3**). This vegetation was subsequently cut and removed with the wetland harvesting effort. Some aquatic vegetation and algae were observed in water (**Photo 4**) and maintenance bench above outlet grate had cattail debris covering it (**Photo 5**); the outlet grate and bench were subsequently cleaned with the wetland harvesting. Several standing dead trees were noted around the PRF (**Photo 6**). The educational signs appear to be in functional shape (**Photos 7 and 8**). The post-storm visit was done on August 26, 2022; no damage was observed from the post-storm visit and a higher water surface was observed (**Photos 9 and 10**). Stressed vegetation and compaction of soils was observed on the access along the embankment (**Photos 11-14**); decompaction and reseeded will likely benefit the recovery of the native grasses and protection of embankment during overtopping events. The maintenance identified for CCBWQA's consideration is cleaning of the outlet grate and decompaction and revegetation of the access along the embankment.



**Photo 3 – 8/1/22**



**Photo 4 – 8/1/22**



**Photo 5 – 8/1/22**



**Photo 6 – 8/1/22**



Photo 7 – 8/1/22



Photo 8 – 8/1/22



**Photo 9 (Post-storm visit on 8/26/22)**



**Photo 10 (Post-storm visit on 8/26/22)**



**Photo 11 – 8/1/22 (before heavy access use in 2022)**



**Photo 12 – 10/10/22 (after heavy use in 2022)**



Photo 13 – 10/10/22 (Compaction test along access)



Photo 14 – 10/10/22 (Compaction test outside of access)

Cottonwood Creek Stream Reclamation: Riparian and wetland vegetation along stream banks is thriving (**Photo 15**). Riffle drops are functioning with some Russian olives, a Colorado noxious weed list B species, present (**Photo 16**). Common reed, a Colorado noxious weed watch-list species, was observed (**Photo 17**). Several downed trees were noted from beaver activity (**Photo 18**). The post-storm visit was done on August 26, 2022; no damage was observed from the post-storm visit and evidence of high-water debris was observed (**Photos 19 and 20**). No maintenance was specifically identified; however, continued monitoring and coordination with CCSP staff on noxious weeds is suggested.



**Photo 15 – 8/1/22**



**Photo 16 – 8/1/22**



**Photo 17 – 8/1/22**



**Photo 18 – 8/1/22**





**Photo 19 (Post-storm visit on 8/26/22)**



**Photo 20 (Post-storm visit on 8/26/22)**

Cherry Creek 12-mile Park Phase I: Phase I was completed in 2012. Bed erosion was noted in 2021 Annual Field Observation. A grade control structure was installed downstream with the Cherry Creek 12-mile Park Phase III project which appears to be helping (**Photos 21 and 22**). Additional bank erosion was observed (**Photo 23**) and the August storm event appears to have accelerated it (**Photo 24**). Bank and bed erosion appear to be active further upstream and away from the grade control structure installed with the Cherry Creek 12-mile Park Phase III project (**Photo 25**). No maintenance was identified; however, a capital project for stream reclamation may be needed. Continued planning is suggested to identify work needed, overall priorities, and costs for Cherry Creek between Lake View Drive and the CCSP Boundary.



**Photo 21 – 7/28/22**



**Photo 22 – 7/28/22**



**Photo 23 (Bank Erosion on 7/28/22)**



**Photo 24 (Bank Erosion at post-storm visit on 8/23/22)**



**Photo 25 – 7/28/22**

Cherry Creek 12-mile Park Phase II: Phase II was completed in 2014 and is experiencing high pedestrian and dog activity. Bed and bank erosion were observed near the boundary between Phase I and Phase II (**Photo 27**). Vegetation continues to be denuded by heavy park use (**Photo 28**). Additional bank erosion was observed (**Photo 29**) and the August storm event appears to have accelerated it (**Photo 30**). Bank erosion was observed on secondary channel, east of main stem (**Photo 31**). No maintenance was identified; however, a capital project for stream reclamation may be needed. Continued planning is suggested to identify work needed, overall priorities, and costs for Cherry Creek between Lake View Drive and the CCSP Boundary.



**Photo 27 – 7/28/22**



**Photo 28 – 7/28/22**



**Photo 29 (Bank and Bed Erosion on 7/28/22)**



**Photo 30 (Bed and Bank Erosion at post-storm visit on 8/23/22)**



**Photo 31 – 7/28/22**

Cherry Creek 12-mile Park Phase III: Phase III was substantially complete (**Photos 32 and 33**) ahead of the August storm event. There was some damage that resulted from the August storm event (**Photos 34 to 35**) and the construction Best Management Practices/Stormwater Control Measures greatly minimized the storm impact. Repairs are anticipated to be made in 2022 as the project is not fully closed out at the time of this report. Weed control is needed to help with vegetation re-establishment in project area; it will likely start with mechanical control and then move to herbicide once grasses start to mature. A capital project for stream reclamation may be needed, continued planning is suggested to identify work needed, overall priorities, and costs for Cherry Creek between Lake View Drive and the CCSP Boundary.



**Photo 32 – 7/28/22**



**Photo 33 – 7/28/22**





**Photo 34 – 8/23/22**



**Photo 35 – 8/23/22**

Shop Creek: There are 5 drop structures within CCSP numbered 1 through 5 from upstream to downstream, and an additional drop structure outside of the CCSP Boundary. Drop 1 has spalling concrete along the crest (**Photos 36**). Drop 2 has spalling concrete along the crest, seepage between layers of roller-compacted concrete, and vegetation growing on downstream face (**Photo 37**). Drop 3 has spalling concrete along the crest, a tree growing next to drop with tree root intrusion in drop (**Photos 38 to 39**), and vegetation growing on downstream face of drop (**Photo 40**). Drop 4 has vegetation growing on downstream face and less severe spalling of concrete (**Photos 41 to 42**). Drop 5 has seepage between layers of roller-compacted concrete and less severe spalling of concrete (**Photo 43**). CCSP performs regular maintenance by cleaning the trash racks and mowing and removing vegetation around inlets (**Photo 44**). No deficiencies were observed with the

educational signage. The maintenance identified for CCBWQA consideration is concrete repairs at crests of drops 1, 2, 3; removal of tree at drop 3; and vegetation control on face of drops 2, 3, and 4. Since seepage was noted on drops 2 and 5, it is recommended that seepage be monitored on all drops.



**Photo 36 – Drop 1 – 7/27/22**



**Photo 37 – Drop 2 – 7/27/22**



**Photo 38 – Drop 3 – 7/27/22**



**Photo 39 – Drop 3 – 7/27/22**



**Photo 40 – Drop 3 – 7/27/22**



**Photo 41 – Drop 4 – 7/27/22**



**Photo 42 – Drop 4 – 7/27/22**



**Photo 43 – Drop 5 – 7/27/22**



**Photo 44 – Drop 5 – 7/27/22**

Quincy Drainage: CCSP Staff cleans outlet structure (**Photo 45**). Some dead standing and fallen trees were observed (**Photo 46**). Bed and bank erosion observed in channel from Lake View Drive to PRF (**Photos 47 to 48**). No maintenance was identified. A capital project for stream reclamation may be needed from Lake View Drive to PRF. Planning is suggested to identify work needed, overall priorities, and costs.



**Photo 45 – 7/27/22**



**Photo 46 – 7/27/22**



**Photo 47 – 7/27/22**





**Photo 48 – 7/27/22**

Dixon Grove (Reservoir Water Surface Elevation = 5548.1 on 7/27/22): Boulders and riprap serve as protection of shoreline (**Photos 49 and 50**). Area includes a water quality capture area (**Photo 51**) that receives runoff from adjacent parking lot (**Photos 52 and 53**). Shoreline erosion was observed just south of Dixon Grove (**Photo 54**). No maintenance needs were identified. Shoreline stabilization may be needed for the erosion located to the south of the PRF, and a planning effort may be useful in identifying work needed, priority, and costs.



**Photo 49 - 7/27/22**



**Photo 50 - 7/27/22**



**Photo 51 - 7/27/22**



**Photo 52 - 7/27/22**



**Photo 53 - 7/27/22**



**Photo 54 - 7/27/22**

East Boat Ramp (Reservoir Water Surface Elevation = 5547.9 on 8/9/22, 5547.3 on 10/4/22): Boulders and riprap serve as protection of shoreline (**Photos 55 and 56**). Maintenance work was completed in October 2022 (**Photos 57 and 58**). Weed control is needed to help with vegetation re-establishment in the project area; it will likely start with mechanical control and then move to herbicide once grasses start to mature.



**Photo 55 - 8/9/22**



**Photo 56 - 8/9/22**



Photo 57 – 10/4/22



Photo 58 – 10/4/22

East Shade Shelters (Reservoir Water Surface Elevation = 5547.9 on 8/9/22):

*South Section:* Boulders and riprap have shifted, and erosion was observed (**Photos 59 to 60, 62**). Concrete walk and bench have been eroded and undermined (**Photo 61**). Social trail with erosion (**Photos 63, 66, 68 to 70**). Shoreline bank erosion was observed (**Photos 64 to 65, 67**). No maintenance needs were identified. Shoreline stabilization may be needed for the erosion located in this section of this PRF, and a planning effort may be useful in identifying work needed, priority, and costs.

*North Section:* This area includes bank erosion (**Photo 71**) and social trails (**Photo 72**). A capital project is currently being designed to stabilize the shoreline. No maintenance needs were identified as the capital project is expected to address the bank erosion and minimize impact of trails.



**Photo 59 – 8/9/22**



**Photo 60 – 8/9/22**



Photo 61 – 8/9/22



Photo 62 – 8/9/22





**Photo 63 – 8/9/22**



**Photo 64 – 8/9/22**



Photo 65 – 8/9/22

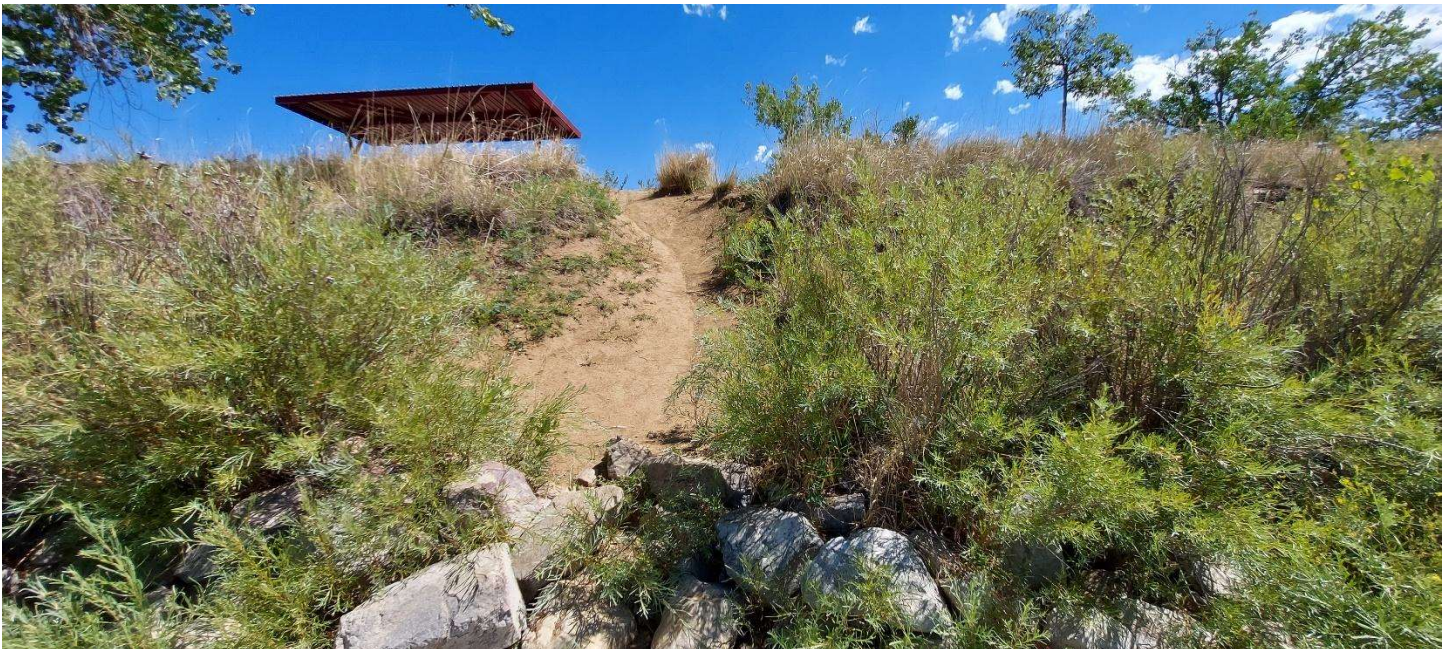
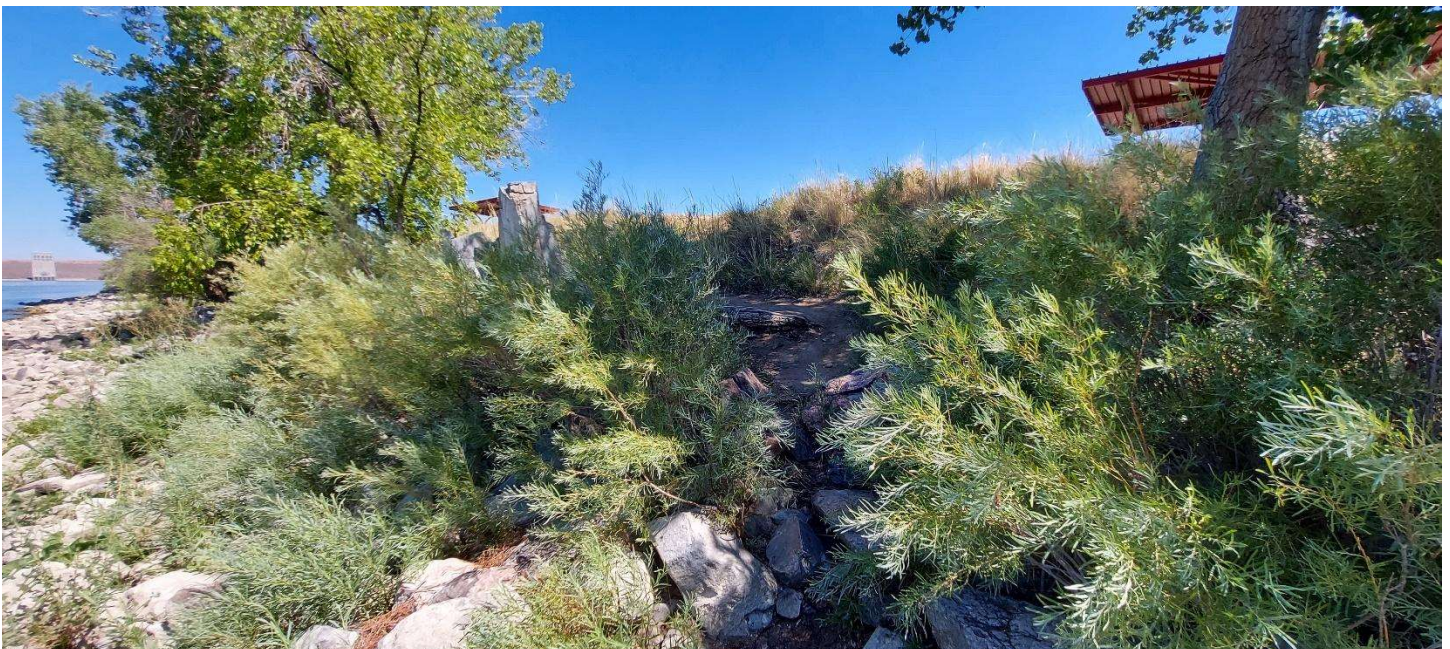


Photo 66 – 8/9/22



**Photo 67 – 8/9/22**



**Photo 68 – 8/9/22**



**Photo 69 – 8/9/22**



**Photo 70 – 8/9/22**



**Photo 71 – 8/9/22**



**Photo 72 – 8/9/22**

Mountain and Lake Loop (Reservoir Water Surface Elevation = 5548.1 on 7/28/22): Approximately 100 feet of shoreline is eroding (**Photo 73**) near the Lake Loop parking lot; there is a current maintenance design and permitting underway. Erosion was noted around a tree (**Photo 74**) near the rowing club storage buildings and the tree's roots seem to be providing some protection. No additional maintenance was identified beyond the current project. It suggested that erosion at tree near rowing club storage buildings be monitored.



**Photo 73 – 7/28/22**



**Photo 74 – 7/28/22**

Tower Loop (Reservoir Water Surface Elevation = 5548.2 on 7/12/22): This area includes boulders and riprap for shoreline protection (**Photo 75**). Bank erosion and social trails (**Photo 76**) are located to the south and east of the PRF; a capital project is currently being designed to stabilize the shoreline. No maintenance needs were identified as the capital project is expected to address the bank erosion and minimize impact of trails.



**Photo 75 – 7/12/22**



**Photo 76**

## Conclusions

The conclusions from the 2022 Annual Field Observation of PRFs are:

1. All PRFs appear to be performing their functions. The Field Observation general assessments included thoughts on maintenance, monitoring, and planning efforts for future capital projects.
2. The maintenance identified for consideration by the TAC and Board includes a Summary of Operation & Maintenance costs and individual budget estimates for Restorative/Rehabilitation work included in **Appendix A**. The Operations and Maintenance cost as the result of this Field Observation for 2022 is \$53,600 as compared to the 2021 budget of \$204,850.
3. Concerns and issues that were located outside the limits of the original PRF or require additional analysis/study beyond the engineering already done for the original PRF were suggested as planning efforts. These planning efforts would identify the capital project needed, determine priority, identify the water quality benefit, and costs. These planning efforts include:
  - a. Cherry Creek 12-mile Park Projects – continued planning on Cherry Creek from Lake View Drive to CCSP Boundary
  - b. Quincy Drainage – planning for stream reclamation on Quincy Drainage to address bank and bed erosion from Lake View Drive to PRF
  - c. Dixon Grove – planning for shoreline stabilization for Cherry Creek Reservoir to address erosion located to the south of the PRF
  - d. East Shade Shelter – planning for shoreline stabilization for Cherry Creek Reservoir to address erosion located in the south section of the PRF



## **Appendix A**

Cherry Creek Basin Water Quality Authority  
**Summary of Operation & Maintenance (O&M) Costs**  
 Prepared / Updated: November 4, 2022

Project	Quantity			CCSP Work	CCBWQA Purchases Seed with CCSP Installation	CCBWQA Work				Comments	Total Cost	
	Each	Hours	Acres	Herbicide Application <sup>1</sup>	Tractor Reseeding (Seed Cost Only) <sup>2</sup>	Weed Control <sup>1</sup>	Tree Planting <sup>3</sup>	Shrub Planting <sup>3</sup>	Misc.			Restorative / Rehabilitation work <sup>4</sup>
Shop Creek	1					\$ 3,000					Herbicide treatment of vegetation growing on faces of drops at 100% CCBWQA, since it isn't weed control related.	\$ 13,000
	1									\$ 10,000	Project carryover from 2022 to 2023, Concrete Repair at Crests of 3 drop structures.	
Cottonwood Wetlands	1									\$ 3,600	PRF Routine, Decompaction and revegetation of access along embankment. Cleaning of outlet grate.	\$ 3,600
Mountain/Lake Loop Shoreline	1									\$ 30,000	Project carryover from 2022 to 2023, Restore shoreline area.	\$ 30,000
East Boat Ramp	1					\$ 3,000					Weed Control for noxious weeds at 100% CCBWQA, since within 5 years of PRF construction.	\$ 3,000
Cherry Creek 12-mile Phase III	1					\$ 4,000					Weed Control for noxious weeds at 100% CCBWQA, since within 5 years of PRF construction.	\$ 4,000
Subtotal						\$ 10,000	\$ -	\$ -	\$ -	\$ 43,600		
<b>Totals</b>						<b>CCSP = \$ -</b>						<b>CCBWQA = \$ 53,600</b>
						<b>Combined = \$ 53,600</b>						

Note 1. CCBWQA performs weed control (mechanical until native grasses mature, then herbicide) for first 5 years after PRF construction; afterwards 50/50 split between CCBWQA and CCSP.  
 Note 2. Reseeding Rate = \$800/acre. CCBWQA purchases seed CCSP installs it with their tractor and the seed attachment purchased by CCBWQA.  
 Note 3. Tree Replacement = \$1,000/ea. Shrub Replacement = \$50/ea. CCBWQA Participation @ 100%.  
 Note 4. PRF Function Repair/Maintenance. Project Specific Estimate. CCBWQA Participation @ 100%.

2022 PRF Field Observation  
 Shop Creek 2023 Repair

Date: 10/31/2022



No.	Item	Quantity	Unit	Unit Price	Extension
1	Mobilization	1	LS	\$ 700.00	\$ 700.00
2	Concrete Repair at Crests	1	LS	\$ 5,000.00	\$ 5,000.00
3	Water Control	1	LS	\$ 1,000.00	\$ 1,000.00
4	Concrete Washout	1	EA	\$ 750.00	\$ 750.00
5	Tree Removal	1	LS	\$ 875.00	\$ 875.00
				Subtotal	\$ 8,325.00
				Contingency 20%	\$ 1,665.00
				Subtotal	\$ 9,990.00
				Surveying	
				Engineering, Permitting & Const Svcs	\$ -
				<b>Total Estimated Construction Cost</b>	<b>\$ 9,990.00</b>

# 2022 PRF Field Observation Cottonwood Wetlands 2023 Repair

Date: 10/31/2022



No.	Item	Quantity	Unit	Unit Price	Extension
1	Mobilization	1	LS	\$ 500.00	\$ 500.00
2	Decompaction	0.2	AC	\$ 5,000.00	\$ 1,000.00
3	Reseeding and Mulch	0.2	AC	\$ 5,000.00	\$ 1,000.00
4	Clean out Outlet Structure	1	LS	\$ 500.00	\$ 500.00

	Subtotal	\$	3,000.00
	Contingency	20% \$	600.00
	Subtotal	\$	3,600.00
	Surveying		
	Engineering, Permitting & Const Svs	\$	-
	<b>Total Estimated Construction Cost</b>	<b>\$</b>	<b>3,600.00</b>

# 2022 PRF Inspection

## Mountain and Lake Loop 2023 Repair

Date: 10/31/2022



No.	Item	Quantity	Unit	Unit Price	Extension
1	Mobilization	1	EA	\$ 1,200.00	\$ 1,200.00
2	Construction Fence	800	LF	\$ 4.50	\$ 3,600.00
3	Erosion Control Log	80	LF	\$ 3.00	\$ 240.00
4	Type M Soil Riprap	85	CY	\$ 185.00	\$ 15,725.00
5	Seed	0.5	AC	\$ 2,500.00	\$ 1,250.00
6	Mulch	0.5	AC	\$ 2,500.00	\$ 1,250.00
7	Remove and Reset Fence for Access	50	LF	\$ 32.00	\$ 1,600.00

Subtotal			\$	24,865.00
Contingency	20%		\$	4,973.00
Subtotal			\$	29,838.00
Surveying				
Engineering, Permitting & Const Svs	30%		\$	-
<b>Total Estimated Construction Cost</b>			<b>\$</b>	<b>29,838.00</b>