



**Cherry Creek Basin Water Quality Authority
Technical Advisory Committee Meeting Agenda
Thursday, October 5, 2023, 9:00 a.m.**

In-person attendance is encouraged due to audio limitations in the meeting room.

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

**Virtual: Zoom¹
<https://us06web.zoom.us/j/87425775963> Passcode: CCBWQA
Phone (646)931-3860 Mtg ID: 874 2577 5963# Passcode: 815374**

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

<https://drive.google.com/drive/folders/12BoEhmFbnnMCxivnpjY2I7T5TzP8Azlq?usp=sharing>

1. Call to Order (9:00) (5 minutes)
 - a. Introduce Michelle Seubert, Cherry Creek State Park
2. Meeting Minutes from September 7, 2023 (enclosed)
3. Highlights from the September 21, 2023 Board Meeting and Watershed Plan Workshop (Clary) (9:05) (5 minutes)
4. Action Items (9:10) (10 minutes)
 - a. Recommendation on IGA Amendment for Cherry Creek at Scott Road (Borchardt, enclosed)*
 - b. Recommendation on IGA for Dove Creek Construction Phase 2 (Borchardt, enclosed)
5. Discussion Items (9:20) (40 minutes)
 - a. CCBWQA 2024 Draft Budget (Clary)
 - b. 2024-2033 Capital Improvement Program (Borchardt, enclosed)
 - c. [CCBWQA Routine Sampling and Analysis Plan](#) (SAP/QAPP) Updates (Stewart)
 - d. Modeling Subcommittee Recommendations (Alan Leak, RESPEC)
6. Presentations (10:00) (15 minutes)
 - a. Social Media Initiative Options for CCBWQA (Lindsey Leyden, LRE Water)
7. Updates (10:15) (15 minutes)
 - a. Cherry Creek Stewardship Partners (Davenhill)
 - b. TAC Members
 - c. TAC Subcommittees
 - i. Modeling Subcommittee
 - ii. Watershed Plan Subcommittee (Clary)
 - a. Touchpoints
 - iii. Cherry Creek Reservoir to Lakeview Drive Alternatives Analysis Subcommittee (Borchardt)
 - d. Contractors
 - i. [Water Quality Update](#) (Stewart)
 - ii. Pollution Abatement Projects
 - a. CIP Status Report (Borchardt, enclosed)
 - b. Wetland Harvesting (Stewart)
 - iii. In-Park PRF and RDS Maintenance and Operations Report (Goncalves)
 - iv. Regulatory (DiToro)
 - v. [Land Use Referral Tracking](#) (Endyk)
 - e. Manager (Clary)
 - i. Confluence at the Confluence, October 17, 2023
8. Adjournment

¹ If you are unable to participate on the CCBWQA's Zoom platform, please email val.endyk@ccbwwqa.org



**Cherry Creek Basin Water Quality Authority
Minutes of the Technical Advisory Committee Meeting
Thursday, September 7, 2023, 9:00 a.m.**

TAC Members Present

Ashley Byerley, SEMSWA
Casey Davenhill, Board Appointee, Cherry Creek Stewardship Partners
Cayla Cappello, City of Greenwood Village
David Van Dellen, Town of Castle Rock (zoom)
Jacob James, City of Lone Tree
James Linden, SEMSWA - Alternate (zoom)
Jeremiah Unger, CDOT
Jessica La Pierre, City of Aurora (zoom)
Jim Watt, Board Appointee, Mile High Flood District (zoom)
Joseph Marencik, City of Castle Pines (zoom)
Jon Erickson, TAC Chair, Board Appointee, Colorado Parks and Wildlife
Larry Butterfield, Board Appointee, Cherry Creek State Park (zoom)
Rebecca Tejada, Board Appointee, Special Districts, Parker Water and Sanitation District (zoom)
Rick Goncalves, Board Appointee
Ryan Adrian, Douglas County (zoom)
Steve Chevalier, Arapahoe County Public Health

Board Members Present

Bill Ruzzo, Assistant Secretary, Governor's Appointee
Tom Downing, Governor's Appointee (zoom)

Others Present

Alan Leak, RESPEC (zoom)
Chris Olosn, Wright Water Engineers (zoom)
Erin Stewart, LRE Water
Jane Clary, Wright Water Engineers, CCBWQA Technical Manager
Jessica DiToro, LRE Water (zoom)
Lily Montesano, Wright Water Engineers
Richard Borchartdt, R2R Engineers
Val Endyk, CCBWQA

1. Call to Order

- a. Introduce Cayla Cappello Representing Greenwood Village**
- b. Introduce Michelle Seubert, Cherry Creek State Park**

Jon Erickson called the meeting to order at 9:00 am and introduced Cayla Cappello from Greenwood Village. Introduction of Michelle Seubert, the new Cherry Creek State Park manager, was postponed to October.

2. Meeting Minutes from August 3, 2023

Rick Goncalves moved to approve the meeting minutes from August 3, 2023. Seconded by Steve Chevalier. The motion carried.

3. Highlights from the August 17, 2023 Board Meeting

Jane Clary provided an update on actions taken at the August 17, 2023 Board meeting. Minutes from the meeting can be found [here](#).

4. Action Items

None

5. Discussion Items

a. 2023 CIP Budget Update

Rich Borchardt provided a [memo](#) to the TAC detailing the impacts of increased construction costs and highlighted the possible variance in CCBWQA PAF budget due to inflation.

The Board would need to approve any project spending, but there is no need for the Board to amend the overall 2023 budget.

A draft 2024 budget will be presented to the TAC and Board in October, with a final 2024 budget in November.

Rich will provide an update on the 2023 CIP budget to the Board at the September meeting.

b. 2024-2033 CIP Schedule and Update

Rich Borchardt provided an update on the 10 year CIP budget and reported that he has reached out to partners to coordinate project planning.

CCBWQA staff is meeting next week to work on the 2024 budget and will consider how next year's CIP spending fits into the larger 10 year plan.

c. Runoff Reduction Study Update and Discussion

Jane Clary introduced Chris Olson from Wright Water Engineers. Chris provided the TAC with an [overview and update](#) on the SEMSWA/MHFD/CCBWQA joint RPA runoff reduction project. He discussed feasibility challenges with completing the studies planned for the monitoring sites within the State Park in regard to limited water access for water truck simulated runoff tests (SRTs) and the potential needed changes to the study.

Seeking TAC input on options presented:

- Option 1: determine alternative sites to perform SRTs
- Option 2: remove CCSP SRTs from scope and budget

TAC discussed the multiple benefits of option 1 including current CDOT studies and how to locate another site like a roadside swale in the basin that could be used and to bring back information to the next TAC meeting.

6. Presentations

a. SEMSWA Stormwater Retrofit Grant Program

Ashley Byerley presented information on the [SEMSWA Grant Retrofit Program](#) that was developed to provide funding to upgrade low functioning, high maintenance stormwater facilities and to provide funding for opportunities such as adding water quality features to detention ponds.

Discussion included:

- SEMSWA would like to see monitoring at some of these sites to quantify water quality benefits of retrofits.
- Consideration of the Authority providing funding to encourage retrofits. For example, the Authority could provide matching funds on such projects or projects outside of the SEMSWA boundary.

7. Updates

a. Cherry Creek Stewardship Partners (Davenhill)

Casey Davenhill provided an update on the successful Watershed Conference and highlighted upcoming Stewardship Partners [events](#).

b. TAC Members

Rebecca Tejada updated the TAC that the third Reg 72 Stakeholder meeting will be held on Sept 14th.

c. TAC Subcommittees

- i. **Modeling Subcommittee**
- ii. **Watershed Plan Subcommittee**
- iii. **Cherry Creek Reservoir to Lakeview Drive Alternatives Analysis Subcommittee**

d. Contractors

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

Erin Stewart provided an update that the sampling for the Wetland Harvesting project for 2023 was completed yesterday and the harvesting effort will start next week.

The low chlorophyll-a concentrations observed this spring and early summer have started to increase and based on the concentrations from July and August, the current seasonal mean is 22.9ug/L. The reservoir appears to be in good condition for this time of year and current weather patterns.

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

a. **CIP Status [Report](#)**

iii. **In-Park PRF and RDS Maintenance and Operations Report (Goncalves)**

Rick Goncalves reported that the annual inspection for the RDS is scheduled for next week.

RDS did sustain a shutdown from clogged oil filters. The problem was resolved and the system was back online within 3 hours.

RDS maintenance will be conducted by Foster Dirt since Blair Wacha is no longer able to provide this service.

iv. **Regulatory (DiToro, enclosed)**

Jessica DiToro provided two regulatory updates: 1) Enclosed is the semi-annual [hearings memo](#) that summarizes the WQCC's RMH procedures and outlines upcoming RMHs that may be of relevance to CCBWQA; and 2) CCBWQA Staff submitted data to the WQCD as part of the 2025 Regulation #93 RMH [data call](#) that will focus on segments found in Regulation #38 (i.e., South Platte Basin).

v. **[Land Use Referral Tracking](#) (Endyk)**

e. Manager (Clary)

8. Upcoming Events

- a. **Watershed Plan Process Workshop - September 21, 2023 - 8:30-11:30 am**

9. Adjournment

Jon Erickson adjourned the meeting at 11:01 am.

FIFTH AMENDMENT TO
AGREEMENT REGARDING
DESIGN AND CONSTRUCTION
OF DRAINAGE AND FLOOD CONTROL IMPROVEMENTS FOR
CHERRY CREEK UPSTREAM OF SCOTT ROAD
DOUGLAS COUNTY

Agreement No. 20-01.12E
Project No. 107751

THIS FIFTH AMENDMENT TO AGREEMENT (hereinafter called "FIFTH AMENDMENT"), by and among URBAN DRAINAGE AND FLOOD CONTROL DISTRICT D/B/A MILE HIGH FLOOD DISTRICT (hereinafter called "DISTRICT"), CHERRY CREEK BASIN WATER QUALITY AUTHORITY (hereinafter called "CCBWQA"), and DOUGLAS COUNTY (hereinafter called "COUNTY") and collectively sometimes referred to as the "PARTIES", and singularly as a "PARTY";

WITNESSETH:

WHEREAS, the PARTIES entered into an "Agreement Regarding Design and Construction of Drainage and Flood Control Improvements for Cherry Creek Upstream of Scott Road, Douglas County" (Agreement No. 20-01.12) dated October 21, 2020 as amended by a First Amendment (Agreement No. 20-01.12A) dated August 16, 2021 as amended by a Second Amendment (Agreement No. 20-01.12B) dated October 29, 2021 and a Third Amendment (Agreement No. 20-01.12C) dated August 12, 2022 (hereinafter collectively referred to as the "AGREEMENT") and a Fourth Amendment (Agreement No. 20-01.12D) dated November 1, 2022 (hereinafter collectively referred to as the "AGREEMENT"); and

WHEREAS, the PARTIES reaffirm their intent to construct drainage and flood control improvements that have water quality benefits for Cherry Creek upstream of Scott Road (hereinafter called "PROJECT"); and

WHEREAS, PARTIES desire to increase the level of funding by \$1,212,011.83 which includes a transfer of \$3,011.83 in Douglas County funding from Cherry Creek at Hess Road Agreement 10-10.05 as Amended, and an additional contribution of \$1,209,000.00 in new capital funds; and

WHEREAS, DISTRICT's Board of Directors has authorized additional DISTRICT financial participation for PROJECT (Resolution No. 78, Series of 2023); and

WHEREAS, the Board of Directors of CCBWQA, the County Commissioners of COUNTY, and the Board of Directors of DISTRICT have *each* authorized, by appropriation or resolution, *their respective PARTY's share of* all of PROJECT costs ~~of the respective PARTIES.~~

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

1. Paragraph 4. PROJECT COSTS AND ALLOCATION OF COSTS Subparagraphs B, C, and D are hereby deleted from the AGREEMENT in their entirety and replaced as follows:
 4. PROJECT COSTS AND ALLOCATION OF COSTS
 - B. It is understood that PROJECT costs as defined above are not to exceed \$5,477,011.83 without amendment to this AGREEMENT.

PROJECT costs for the various elements of the effort are estimated as follows:

	<u>ITEM</u>	<u>AS AMENDED</u>	<u>PREVIOUSLY AMENDED</u>
1.	Final Design	\$ 1,100,000	\$ 650,000
2.	Construction *	\$ 4,077,011.83	\$ 3,615,000
3.	Contingency	\$ 300,000	\$ -0-

Grand Total \$ 5,477,011.83 \$ 4,265,000

*It is anticipated that additional funds for construction shall be added by amendment to this AGREEMENT at a future date.

This breakdown of costs is for estimating purposes only. Costs may vary between the various elements of the effort without amendment to this AGREEMENT provided the total expenditures do not exceed the maximum contribution by all PARTIES plus accrued interest.

C. Based on total PROJECT costs, the maximum percent and dollar contribution by each party PARTY shall be:

	<u>Percentage Share</u>	<u>Previously Contributed</u>	<u>Special Funds Transfer</u>	<u>Additional Contribution</u>	<u>Maximum Contribution</u>
DISTRICT	35%	\$ 1,425,000		\$500,000	\$ 1,925,000
CCBWQA	24%	\$ 900,000		\$409,000	\$ 1,309,000
COUNTY	41%	\$1,940,000	\$3,011.83	\$300,000	\$2,243,011.83
TOTAL	100.00%	\$4,265,000	\$3,011.83	\$1,209,000	\$5,477,011.83

D. It is understood and agreed that notwithstanding any other provision contained herein to the contrary, any additional contribution of a PARTY hereunder, whether direct or contingent, shall under no circumstances exceed the PARTY’S Maximum Contribution indicated above without the prior express written consent of the PARTY.

E. At the request of COUNTY, the following COUNTY funds may be transferred to PROJECT from a separate special fund held by DISTRICT:

Transfer from: T&A #5608
 Account No. 50-05-76111-005608
 Amount: \$3,011.83

2. Paragraph 5. MANAGEMENT OF FINANCES is deleted in its entirety from the AGREEMENT and replaced as follows:

5. MANAGEMENT OF FINANCES

As set forth in DISTRICT policy (Resolution No. 11, Series of 1973, Resolution No. 49, Series of 1977, and Resolution No. 37, Series of 2009), the funding of a local body's share may come from its own revenue sources or from funds received from state, federal or other sources of funding without limitation and without prior Board approval.

Payment of each PARTY's full share (CCBWQA - \$1,309,000; COUNTY - \$2,243,011.83; DISTRICT - \$1,925,000) shall, to the extent not already paid, be made to DISTRICT subsequent to execution of this AGREEMENT and within thirty (30) days of request for payment by DISTRICT. The payments by PARTIES shall be held by DISTRICT in a special fund to pay for increments of PROJECT as authorized by PARTIES, and as defined herein. DISTRICT shall provide a periodic accounting of PROJECT funds as well as a periodic notification to CCBWQA and COUNTY of any unpaid obligations. Any interest earned by the monies contributed by PARTIES shall be accrued to the special fund established by DISTRICT for PROJECT and such interest shall be used only for PROJECT upon approval by the contracting officers (Paragraph 13).

It is understood and agreed that a portion of each PARTY’S above referenced share has previously been paid to DISTRICT as set forth in Paragraph 4. C. in the column labeled “Previously Contributed”.

Within one (1) year of completion of PROJECT if there are monies including interest earned remaining which are not committed, obligated, or disbursed, each PARTY shall receive a share of such monies, which shares shall be computed as were the original shares; or at CCBWQA and COUNTY request, CCBWQA's and COUNTY's share of remaining monies shall be transferred to another special fund held by DISTRICT.

3. All other terms and conditions of this AGREEMENT shall remain in full force and effect.

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

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

By _____

Name: Laura A. Kroeger

Title: Executive Director

Date _____

Checked By

BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF DOUGLAS

By: _____
Chair

Date _____

ATTEST:

Kristin Randlett, Deputy Clerk to the Board

APPROVED AS TO CONTENT:

Douglas J. DeBord, County Manager

APPROVED AS TO LEGAL FORM:

Chris Pratt, Assistant County Attorney

APPROVED AS TO FISCAL CONTENT:

Andrew Copland, Director of Finance

CHERRY CREEK BASIN
WATER QUALITY AUTHORITY

CCBWQA Checked by

By _____

Name Joshua Rivero

Title CCBWQA Chairman

Date _____

Attest:

APPROVED AS TO FORM:

Timothy J. Flynn, General Counsel for CCBWQA



ACTION ITEM MEMORANDUM

To: CCBWQA Technical Advisory Committee (TAC)
From: Richard Borchardt, Pollution Abatement Project Manager
Date: October 5, 2023
Subject: Dove Creek Stream Reclamation Improvements from Otero Avenue to Pond D1 – IGA

Request: The TAC recommends that the Board authorize the preparation of the Intergovernmental Agreement (IGA) with SEMSWA for the second phase of construction of the Dove Creek Stream Reclamation, an expenditure for an amount not to exceed \$540,000, and a member of the executive committee to execute the IGA.

Project: The design has been completed on Dove Creek from Otero Avenue to Pond D1 located upstream of Broncos Parkway in the City of Centennial. RESPEC is the design engineer. The construction of the first phase from Otero Avenue to Chambers Road was completed early this year by Concrete Express. The Project sponsors are CCBWQA and the Southeast Metro Stormwater Authority (SEMSWA) which is the project lead. Dove Creek is a tributary to Cherry Creek. The proposed stream improvements benefit the water quality in Cherry Creek and the Cherry Creek Reservoir by reducing bed and bank erosion and immobilizing Phosphorus in the adjacent soils. It is estimated that this 0.51 mile long-project will immobilize 46 pounds of phosphorus annually. The second phase of construction between Chambers Road and Pond D1 is scheduled for early 2024.



Funding: The second phase of construction is currently estimated at \$2,160,000 (\$540,000 CCBWQA and \$1,620,000 SEMSWA). CCBWQA’s participation in the overall project is 15.6% which is less than the 25% the limit historically used on partner projects. SEMSWA’s participation for the second phase of construction is anticipated in 2024 and a future IGA Amendment may be needed.

Funding Source	2021	2022		2023 Phase 1 Construction		Phase 2 Construction			
	Engineering Design	Additional Annual Funding	Cumulative Project Funding	Additional Annual Funding	Cumulative Project Funding	Project Sponsor %	2023 Additional Annual Funding	2024 Additional Annual Funding	Cumulative Project Funding
SEMSWA	\$100,000	\$200,000	\$300,000	\$2,262,000	\$2,562,000	84.3%	\$0	\$1,620,000	\$4,182,000
CCBWQA	\$25,000	\$75,000	\$100,000	\$138,000	\$238,000	15.6%	\$540,000	\$0	\$778,000
Total	\$125,000	\$275,000	\$400,000	\$2,400,000	\$2,800,000	100.0%	\$540,000	\$1,620,000	\$4,960,000

Budget: CCBWQA's 2023 Budget includes \$138,000 for this Project. Likely delays in project construction will reduce CCBWQA's Pollution Abatement Fund (PAF) capital expenditures by \$1,310,000; \$540,000 could be used towards the Phase 2 construction, bringing CCBWQA's 2023 funding to a total of \$678,000.

Motion: I move to recommend that the Board authorize the preparation of the Intergovernmental Agreement (IGA) with SEMSWA for the second phase of construction of the Dove Creek Stream Reclamation, an expenditure for an amount not to exceed \$540,000, and a member of the executive committee to execute the IGA.



Photo of Dove Creek downstream of Chambers Road (Courtesy of Molly Trujillo)



Photo of Dove Creek upstream of Chambers Road (Courtesy of Molly Trujillo)

CHERRY CREEK BASIN WATER QUALITY AUTHORITY
TABLE 1 - SUMMARY OF POTENTIAL POLLUTANT REDUCTION FACILITIES
REVISIONS FOR 2024 - 2033 CIP

Date: September 26, 2023

Color Code: Blue: Project Completed

Green: Planned for design/construction during 5-year period

* Updated based on 2023 total project cost and stream length information. O&M costs adjusted to be similar cost baseline. Projects that were bid/constructed in phases, were separated into those phases to facilitate adjustment to 2023 costs on PRFs for WQ Analysis.

Please see comment for more information and include in presentation to TAC and Board.

Projects highlighted so that original project information compared with updated project information (denoted with *).

Project under consideration for additional funding from CCBWQA in 2023, final option will be included in CIP when funding decision and direction are received from TAC and Board.

Proj. Designation	Project Title	Status	Description	Design Basis				Projected Loads		Projected Treatment		Cost Estimate (1000\$)										Unit Cost (\$/pound)		Note		
				PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)	w/o cost sharing	w/cost sharing			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)		
CCR-1	Reservoir Destratification (mixing)	Officially start-up April 2008	Use inlake mixing to minimize algae blooms, therefore chlorophyll a	369	sq mi	n/a	n/a	n/a	n/a	n/a	n/a	810	lbs/season	\$ 968			\$ 28	\$ 80	100%	\$968	\$ 99	\$ 99				
CCB-1	CCSP Wetlands	Prelim design prepared in 2003 (Ref 1, 8)	Restore 60 Acres of wetlands in multiple phases	369	sq mi	3.5 cfs avg daily flow	1415 af/210 days	0.35	mg/l	1050	lbs/yr	Base flow	600	lbs/season	\$ 1,928	\$ -	\$ -	\$ -	\$ 19	\$ 123	100%	\$1,928	\$ 204	\$ 204	18	
CCB-5.2	Arapahoe/Douglas County Line Stream Stabilization	Project completed w/o Authority participation	Local stream stabilization (L = 2700 ft)	0.51	mi			100	lbs/mi	51	lbs/yr	Storm Flow	90%	46	lbs/year	\$ 1,062	\$ -	\$ -	\$ -	\$ 1	\$ 58	0%	\$0	\$ 1,258	\$ -	2
CCB-5.3	Cottonwood Bridge Stream Stabilization	Project completed by Parker w/o Authority participation	Local stream stabilization (L = 2700 ft)	0.51	mi			100	lbs/mi	51	lbs/yr	Storm Flow	90%	46	lbs/year	\$ 436	\$ -	\$ -	\$ -	\$ 2	\$ 25	0%	\$0	\$ 551	\$ -	2
CCB-5.5	Stroh Road Stream Stabilization	Project completed by Parker w/o Authority participation	Stream stabilization (L = 5000 ft)	0.95	mi			100	lbs/mi	95	lbs/yr	Storm Flow	90%	85	lbs/year	\$ 218	\$ -	\$ -	\$ -	\$ 1	\$ 13	0%	\$0	\$ 149	\$ -	2
CCB-5.7	Cherry Creek Stream Stabilization at Eco-Park (SEMSWA)	IGA w/SEMSWA for design in 2010 and construction in 2011/2012	Local stream stabilization (L = 6850 ft)	1.30	mi			100	lbs/mi	130	lbs/yr	Storm Flow	90%	117	lbs/year	\$ 4,756	\$ -	\$ -	\$ -	\$ 1	\$ 256	24%	\$1,155	\$ 2,191	\$ 532	2, 3
CCB-5.7*	Cherry Creek Stream Stabilization at Eco-Park (SEMSWA)	IGA w/SEMSWA for design in 2010 and construction in 2011/2012	Local stream stabilization (L = 4850 ft)	0.92	mi			100	lbs/mi	92	lbs/yr	Storm Flow	90%	83	lbs/year	\$ 4,756	\$ -	\$ -	\$ -	\$ 2	\$ 257	19%	\$905	\$ 3,106	\$ 591	2, 3, 7
CCB-5.9.1	Cherry Creek Stream Stabilization at 12-Mile Park (CCSP) - Phase I	Design completed in 2011 for Phase I.	Local stream stabilization (L = 500 ft)	0.09	mi			100	lbs/mi	9	lbs/yr	Storm Flow	90%	9	lbs/year	\$ 296	\$ -	\$ -	\$ -	\$ 1	\$ 17	100%	\$296	\$ 1,979	\$ 1,979	2, 20
CCB-5.9.2	Cherry Creek Stream Stabilization at 12-Mile Park (CCSP) - Phase II	Design completed in 2013 for Phase II.	Local stream stabilization (L = 2500 ft)	0.47	mi			100	lbs/mi	47	lbs/yr	Storm Flow	90%	43	lbs/year	\$ 1,429	\$ -	\$ -	\$ -	\$ 1	\$ 78	100%	\$1,429	\$ 1,820	\$ 1,820	2, 20
CCB-5.10	Cherry Creek Stream Stabilization at PJCOS (Vermillion Creek, PJMD.)	Design completed by PJMD. Authority is funding partner in design	Local stream stabilization (L = 5100 ft)	0.97	mi			100	lbs/mi	97	lbs/yr	Storm Flow	90%	87	lbs/year	\$ 3,017	\$ -	\$ -	\$ -	\$ 2	\$ 164	21%	\$643	\$ 1,882	\$ 401	2, 3
CCB-5.11	Cherry Creek Stream Stabilization at Norton Farms (Parker)	Conceptual design by UDFCD identified priority 3	Local stream stabilization (L = 2200 ft)	0.42	mi			100	lbs/mi	42	lbs/yr	Storm Flow	90%	38	lbs/year	\$ 900	\$ -	\$ -	\$ -	\$ 1	\$ 49	28%	\$252	\$ 1,313	\$ 368	2, 3
CCB-5.11*	Cherry Creek Stream Stabilization at Norton Farms (Parker)	Conceptual design by UDFCD identified priority 3	Local stream stabilization (L = 2500 ft)	0.47	mi			100	lbs/mi	47	lbs/yr	Storm Flow	90%	43	lbs/year	\$ 1,103	\$ -	\$ -	\$ -	\$ 1	\$ 60	23%	\$255	\$ 1,410	\$ 326	2, 3
CCB-5.12	Cherry Creek Stream Stabilization at Pine Lane	Project completed by Parker w/o Authority participation	Local stream stabilization (L = 1500 ft)	0.28	mi			100	lbs/mi	28	lbs/yr	Storm Flow	90%	26	lbs/year	\$ 500	\$ -	\$ -	\$ -	\$ 1	\$ 28	0%	\$0	\$ 1,087	\$ -	
CCB-5.14	Cherry Creek Stream Reclamation - CCSP to Eco Park (Ph II to V)	IGA w/SEMSWA for design in 2010	Local stream stabilization (L = 11000 ft)	2.08	mi			100	lbs/mi	208	lbs/yr	Storm Flow	90%	188	lbs/year	\$ 10,200	\$ -	\$ -	\$ -	\$ 1	\$ 547	25%	\$2,499	\$ 2,920	\$ 715	
CCB-5.14B	Cherry Creek Stream Reclamation - Valley Country Club	Projects with UDFCD, SEMSWA, and Aurora. Phases started in 2010.	Local stream stabilization (L = 2000 ft = 1400 ft on Cherry Creek and 600 ft. on Tributary)	0.38	mi			100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 2,284	\$ -	\$ -	\$ -	\$ 1	\$ 123	21%	\$484	\$ 3,607	\$ 764	2, 3
CCB-5.15	Cherry Creek Stream Reclamation at Country Meadows (Hess Rd)	Project by Town of Parker and Douglas County	Local stream stabilization (L = 7700 ft)	1.46	mi			100	lbs/mi	146	lbs/yr	Storm Flow	90%	131	lbs/year	\$ 2,170	\$ -	\$ -	\$ -	\$ 2	\$ 118	24%	\$520	\$ 901	\$ 216	2, 3
CCB-5.15*	Cherry Creek Stream Reclamation at Country Meadows (Hess Rd)	Project by Town of Parker and Douglas County	Local stream stabilization (L = 4200 ft)	0.80	mi			100	lbs/mi	80	lbs/yr	Storm Flow	90%	72	lbs/year	\$ 2,788	\$ -	\$ -	\$ -	\$ 2	\$ 151	25%	\$695	\$ 2,114	\$ 527	2, 3, 7
CCB-5.16	Cherry Creek Stream Reclamation - 12 Mile Phase III	Project w/in CCSP identified as Reach 1 in Project CCB-5.14 work.	Local stream stabilization (L = 30 ft.)	0.01	mi			100	lbs/mi	1	lbs/yr	Storm Flow	90%	1	lbs/year	\$ 300	\$ -	\$ -	\$ -	\$ 3	\$ 19	100%	\$300	\$ 37,299	\$ 37,299	2, 20
CCB-5.17.1A	Cherry Creek Stream Reclamation at KOA	Preliminary design completed 2019, Extension Requested by UDFCD and Parker in 2019	Local stream stabilization (L = 1400 ft original, L = 2000 ft with 600 ft extension)	0.38	mi			100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 2,035	\$ -	\$ -	\$ -	\$ 20	\$ 129	20%	\$375	\$ 3,795	\$ 776	2, 3
CCB-5.17.1A*	Cherry Creek Stream Reclamation at KOA	Preliminary design completed 2019, Extension Requested by UDFCD and Parker in 2019	Local stream stabilization (L = 1400 ft original, L = 2000 ft with 600 ft extension)	0.38	mi			100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 1,806	\$ -	\$ -	\$ -	\$ 1	\$ 98	18%	\$333	\$ 2,868	\$ 529	2, 3, 7
CCB-5.17.1B	Cherry Creek Stream Reclamation at Dransfeldt	Design in 2021, Construction in 2023	Local stream stabilization (L = 2400 ft original)	0.45	mi			100	lbs/mi	45	lbs/yr	Storm Flow	90%	41	lbs/year	\$ 7,274	\$ -	\$ -	\$ -	\$ 1	\$ 391	12%	\$837	\$ 9,551	\$ 1,099	2, 3
CCB-6.1	Piney Creek Stream Stabilization - Project 1	Authority funded \$118,000 Arapahoe County in 2002.	Restore 5200 lf upstream of Parker Road	22.90	sq mi	n/a	n/a	100	lbs/mi	100	lbs/yr	Storm Flow	90%	90	lbs/year	\$ 997	\$ -	\$ -	\$ -	\$ 10	\$ 63	13%	\$130	\$ 705	\$ 92	2, 3
CCB-6.2	Piney Creek Stream Stabilization - Project 2 U/S Buckley Rd	Project completed w/o Authority participation	Reclaim 1700 lf upstream of Buckley Road	0.32	mi			100	lbs/mi	32	lbs/yr	Storm Flow	90%	29	lbs/year	\$ 998	\$ -	\$ -	\$ -	\$ 1	\$ 54	12%	\$120	\$ 1,880	\$ 226	2, 3

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Proj. Designation	Project Title	Status	Description	Design Basis				Projected Loads		Projected Treatment				Cost Estimate (1000S)							Unit Cost (\$/pound)		Note				
				PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)	w/o cost sharing		w/cost sharing			
39	CCB-6.4	Piney Creek Stream Reclamation - Reaches 6 & 7	Request from UDFCD in 2014	Local stream stabilization (L = 6,000 ft)	1.14	mi			unk		365	lbs/yr	Storm Flow	90%	329	lbs/year	\$ 11,000	\$ -	\$ -	\$ -	\$ 2	\$ 591	25%	\$2,750	\$ 1,800	\$ 450	12
40	CCB-6.4A *	Piney Creek Stream Reclamation - Reach 7	Request from UDFCD in 2014	Local stream stabilization (L = 2,340 ft)	0.44	mi			100	lbs/mi	44	lbs/mi	Storm Flow	90%	40	lbs/year	\$ 3,765	\$ -	\$ -	\$ -	\$ 1	\$ 203	14%	\$512	\$ 5,082	\$ 691	2, 3, 7
41	CCB-6.4B.1 *	Piney Creek Stream Reclamation - Reach 6 upstream of Caley	Request from UDFCD in 2014	Local stream stabilization (L = 1,600 ft)	0.30	mi			100	lbs/mi	30	lbs/yr	Storm Flow	90%	27	lbs/year	\$ 2,896	\$ -	\$ -	\$ -	\$ 1	\$ 156	14%	\$394	\$ 5,726	\$ 779	2, 3, 7
42	CCB-6.4B.2 *	Piney Creek Stream Reclamation - Reach 6 Phase 2	Request from UDFCD in 2014	Local stream stabilization (L = 2,580 ft)	0.49	mi			100	lbs/mi	49	lbs/yr	Storm Flow	90%	44	lbs/year	\$ 2,659	\$ -	\$ -	\$ -	\$ 1	\$ 143	14%	\$361	\$ 3,262	\$ 443	2, 3, 7
43	CCB-7.1	McMurdo Gulch Reclamation (Castle Rock)	Project completed in 2011	Stream Reclamation (L = 15,000 lf)	2.84	mi			100	lbs/mi	284	lbs/yr	Storm Flow	90%	256	lbs/year	\$ 1,470	\$ -	\$ -	\$ -	\$ 28	\$ 107	43%	\$630	\$ 419	\$ 180	
44	CCB-7.2	McMurdo Gulch Reclamation (Castle Rock) 19/20 Project	Design in 2019, Construction in 2020	Stream Reclamation (L = 2,000 lf)	0.38	mi			100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 1,677	\$ -	\$ -	\$ -	\$ 17	\$ 107	25%	\$420	\$ 3,127	\$ 783	2, 3
45	CCB-7.2 *	McMurdo Gulch Reclamation (Castle Rock) 19/20 Project	Design in 2019, Construction in 2020	Stream Reclamation (L = 2,000 lf)	0.38	mi			100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 1,156	\$ -	\$ -	\$ -	\$ 1	\$ 63	25%	\$289	\$ 1,846	\$ 462	2, 3, 7
46	CCB-7.3	McMurdo Gulch Reclamation (Castle Rock) 20/21/22 Project	Design in 2020, Construction 2021	Stream Reclamation (L = 3,700 lf)	0.70	mi			100	lbs/mi	70	lbs/yr	Storm Flow	90%	63	lbs/year	\$ 2,460	\$ -	\$ -	\$ -	\$ 25	\$ 156	25%	\$615	\$ 2,480	\$ 620	2, 3
47	CCB-7.3 *	McMurdo Gulch Reclamation (Castle Rock) 20/21/22 Project	Design in 2020, Construction 2021	Stream Reclamation (L = 3,700 lf)	0.70	mi			100	lbs/mi	70	lbs/yr	Storm Flow	90%	63	lbs/year	\$ 1,940	\$ -	\$ -	\$ -	\$ 1	\$ 105	24%	\$466	\$ 1,664	\$ 400	2, 3, 7
48	CCB-12	Bowtie Property PRF	Purchase completed 2003	Stabilize confluence (Ph I) and construct sediment pond (Ph 2)	22	sq mi	2-year flood	300 af	500	mg/l/ton	85	lbs/yr	base flow and minor flood	70% pond 65% wetlands	235	lbs/year	\$ 826	\$ 300	\$ 63	\$ 1.8	\$ 6	\$ 70	100%	\$826	\$ 299	\$ 299	2
49	CCB-13.1	Cottonwood/Peoria Wetlands Pond	Completed 2003. Restorative maintenance required in 2009	Joint funded project with UDFCD, GWV, Arapahoe County	8.30	sq mi							base and flood flows	measured	363	lbs/year	\$ 1,636	\$ -	\$ -	\$ -	\$ 5	\$ 93	12%	\$196	\$ 255	\$ 31	2
50	CCB-13.2	Cottonwood Stream Reclamation in CCSP	Phase I completed in 2004. Phase II completed June 2008 (Ref 2)	11,600 lf of stream reclamation from Peoria to Perimeter Rd. Pond	2.20	mi			100	lbs/mi	220	lbs/yr	base and flood flows	see separate calcs	730	lbs/year	\$ 2,200	\$ -	\$ -	\$ -	\$ 55	\$ 173	100%	\$2,200	\$ 237	\$ 237	2
51	CCB-13.3	Cottonwood Creek Stream Stabilization at Easter Avenue	Authority contributed \$338,000 for construction in 2010.	2,600 lf of stream reclamation from Easter Ave to Briarwood Ave	0.49	mi			100	lbs/mi	49	lbs/yr	Storm Flow	90%	44	lbs/year	\$ 1,350	\$ -	\$ -	\$ -	\$ 1	\$ 73	25%	\$338	\$ 1,655	\$ 414	2
52	CCB-13.4	Peoria Trib B/Airport East and West Pond (Outfall C-1)	Cottonwood Creek Master Planned Improvements. Ponds combined into one.	Combined existing detention ponds and provided EURV	0.35	sq mi			400	lbs/sq mi	140	lbs/yr	Base and storm flow	40%	56	lbs/yr	\$ 523	\$ -	\$ -	\$ -	\$ -	\$ 28	25%	\$131	\$ 500	\$ 125	
53	CCB-17.2	Reservoir Shoreline Stabilization Mountain Loop Trail	Scheduled for construction beginning in 2012	CCSP Recreation sites: Mountain, Lake and Cottonwood Creek Loops (2,300 ft of shoreline)											54	lbs/yr	\$ 1,131	\$ -	\$ -	\$ -	\$ 5	\$ 66	100%	\$1,131	\$ 1,215	\$ 1,215	1, 16
54	CCB-17.3	West Boat Ramp Parking Lot WQ Improvements	Final design completed in 2012	Provide water quality treatment of parking lot runoff.	3.43	ac prkg lot					3	lbs/yr	parking lot	70%	2	lbs/yr	\$ 330	\$ -	\$ -	\$ -	\$ 1	\$ 19	100%	\$330	\$ 8,903	\$ 8,903	1
55	CCB-17.4	East Boat Ramp Shoreline Stabilization Phase II	Identified during 2012 annual PRF inspection	105 lf of bank stabilization	105	lf	0.1 cy/yr/ft		0.14	lbs/lf	14.7	lbs/yr	bank erosion	80%	12	lbs/yr	\$ 91	\$ -	\$ -	\$ -	\$ 2	\$ 7	100%	\$91	\$ 585	\$ 585	1, 16
56	CCB-17.5	East Shade Shelter Shoreline Stabilization Phase II	Identified during 2012 annual PRF inspection	20 lf of bank stabilization	20	lf	0.1 cy/yr/ft		0.14	lbs/lf	2.8	lbs/yr	bank erosion	80%	2	lbs/yr	\$ 18	\$ -	\$ -	\$ -	\$ -	\$ 1	100%	\$18	\$ 431	\$ 431	1, 16
57	CCB-20.1	Detention Pond Retrofit Program - McMurdo Gulch	Phase 1 - McMurdo Gulch	Modify existing ponds to meet current standards for WQ	1	Each			0.40	lbs/Trib Acre	0.4	lbs/yr	Residential		9	lbs/pond/yr	\$ 60	\$ -	\$ -	\$ -	\$ 0	\$ 4	100%	\$60	\$ 396	\$ 396	1, 17
58	CCB-22.2	Happy Canyon Creek Upstream of I-25 (MHFD)	Requested in 2020	3000 lf of stream reclamation	0.57	mi			100	lbs/mi	57	lbs/yr	Storm Flow	90%	51	lbs/year	\$ 5,441	\$ -	\$ -	\$ -	\$ 54	\$ 346	9%	\$500	\$ 6,765	\$ 622	2, 3
59	CCB-22.2*	Happy Canyon Creek Upstream of I-25 (MHFD)	Requested in 2020	3000 lf of stream reclamation	0.57	mi			100	lbs/mi	57	lbs/yr	Storm Flow	90%	51	lbs/year	\$ 4,021	\$ -	\$ -	\$ -	\$ 1	\$ 216	9%	\$362	\$ 4,232	\$ 381	2, 3, 7
60	CCB-23.2	Dove Creek Otero to Chambers Rd. (SEMSWA)	Requested in 2020	1400 lf of stream reclamation	0.27	mi			100	lbs/mi	27	lbs/yr	Storm Flow	90%	24	lbs/year	\$ 2,600	\$ -	\$ -	\$ -	\$ 1	\$ 140	9%	\$238	\$ 5,879	\$ 538	2, 3

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				PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital from 2023 to 2032 CIP	Total Project Cost update to 2023 \$	Design in 2023 \$	Capital in 2023 \$	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)			
65	CCB-5.4	Cherry Creek Stream Stabilization at Main Street (Parker)	Conceptual design by UDFCD	Local stream stabilization (L = 4000 ft)	0.76	mi			100	lbs/mi	76	lbs/yr	Storm Flow	90%	68	lbs/year	\$ 1,776	\$ 5,600	\$ 840	\$ 4,760	\$ -	\$ -	\$ -	\$ 2	\$ 302	25%	\$1,400

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Proj. Designation	Project Title	Status	Description	Design Basis				Projected Loads		Projected Treatment			Cost Estimate (1000S)							Unit Cost (\$/pound)		Note					
				PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)		w/o cost sharing	w/cost sharing			
66	CCB-5.6	Cherry Creek Stream Stabilization at Lincoln Avenue (Parker)	Conceptual design by UDFCD	Local stream stabilization (L = 2350 ft)	0.45	mi			100	lbs/mi	45	lbs/yr	Storm Flow	90%	40	lbs/year	\$ 1,447	\$ 3,290	\$ 494	\$ 2,797	\$ -	\$ -	\$ -	\$ 1	\$ 177	25%	\$823
67	CCB-5.14C	Cherry Creek Stream Reclamation - Valley Country Club to Soccer Fields (Reaches 3 and 4)	Projects with UDFCD, SEMSWA, and Aurora. Phases started in 2010.	Local stream stabilization (L = 5167 ft on Cherry Creek)	0.98	mi			100	lbs/mi	98	lbs/yr	Storm Flow	90%	88	lbs/year	\$ 5,287	\$ 10,600	\$ 1,590	\$ 9,010	\$ -	\$ -	\$ -	\$ 2	\$ 570	25%	\$2,650
68	CCB-5.14D	Cherry Creek Stream Reclamation - Remaining Sections (not included in Reaches 3 and 4) from Valley Country Club to Soccer Fields	Projects with UDFCD, SEMSWA, and Aurora. Phases started in 2010.	Local stream stabilization (L = 3688 ft on Cherry Creek)	0.70	mi			100	lbs/mi	70	lbs/yr	Storm Flow	90%	63	lbs/year	\$ 2,980	\$ 5,163	\$ 774	\$ 4,389	\$ -	\$ -	\$ -	\$ 1	\$ 278	25%	\$1,291
69	CCB-5.16A	Cherry Creek Stream Reclamation - Reservoir to Lake View Drive (Reach 1 in Muller's 2022 Stream Assessment Report)	Project w/in CCSP	Local stream stabilization (L=5400 ft.)	1.02	mi			100	lbs/mi	102.3	lbs/yr	Storm Flow	90%	92	lbs/year	\$ 6,842	\$ 11,846	\$ 1,777	\$ 10,069	\$ -	\$ -	\$ -	\$ 6	\$ 641	100%	\$11,846
70	CCB-5.17.2 (\$500k MHFD, \$300K Douglas, \$409k CCBWQA in 2023)	Cherry Creek Stream Reclamation U/S Scott Road	Project requested by Douglas County and UDFCD in 2019	Local stream stabilization (L = 4300 ft)	0.81	mi			100	lbs/mi	81	lbs/yr	Storm Flow	90%	73	lbs/year	\$ 5,477	\$ 5,477	\$ 822	\$ 4,655	\$ -	\$ -	\$ -	\$ 2	\$ 295	24%	\$1,309
71	CCB-5.17.2 (\$500k MHFD, \$300K Douglas, no additional CCBWQA \$ in 2023)	Cherry Creek Stream Reclamation U/S Scott Road	Project requested by Douglas County and UDFCD in 2019	Local stream stabilization (L = 4300 ft)	0.81	mi			100	lbs/mi	81	lbs/yr	Storm Flow	90%	73	lbs/year	\$ 5,477	\$ 5,477	\$ 822	\$ 4,655	\$ -	\$ -	\$ -	\$ 2	\$ 295	16%	\$900
72	CCB-6.5	Piney Creek Reach 1 to 2 (SEMSWA)	Requested in 2020	2900 lf of stream reclamation	0.55	mi			100	lbs/mi	55	lbs/mi	Storm Flow	90%	49	lbs/year	\$ 2,350	\$ 4,060	\$ 609	\$ 3,451	\$ -	\$ -	\$ -	\$ 1	\$ 219	25%	\$1,015
73	CCB-6.6	Piney Creek Tower to Orchard (SEMSWA)	Requested in 2020	3800 lf of stream reclamation	0.72	mi			100	lbs/mi	72	lbs/mi	Storm Flow	90%	65	lbs/year	\$ 3,000	\$ 5,320	\$ 798	\$ 4,522	\$ -	\$ -	\$ -	\$ 1	\$ 286	25%	\$1,330
74	CCB-7.4	McMurdo Gulch Reclamation (Castle Rock) 22/23/24/25 Project	Design in 2022- 2023, Construction in 2024	Stream Reclamation (L = 6,550 lf)	1.24	mi			100	lbs/mi	124	lbs/yr	Storm Flow	90%	112	lbs/year	\$ 3,298	\$ 5,162	\$ 774	\$ 4,388	\$ -	\$ -	\$ -	\$ 2	\$ 279	25%	\$1,292
75	CCB-13.3.1A	Cottonwood Creek Cattail Harvesting from Reservoir to Peoria Street~	Pilot Project - Odd Years Harvest Left Bank	1.7 Acres of Cattail Harvesting	2.90	mi				lbs/mi	30	lbs/yr	Storm Flow	100%	59	lbs/year	\$ 60	\$ 90	\$ -	\$ 90	\$ -	\$ -	\$ -	\$ -	\$ 5	100%	\$90
76	CCB-13.3.1B	Cottonwood Creek Cattail Harvesting from Reservoir to Peoria Street~	Pilot Project - Even Years Harvest Right Bank	2.0 Acres of Cattail Harvesting	2.90	mi				lbs/mi	237	lbs/yr	Storm Flow	100%	60	lbs/year	\$ 60	\$ 90	\$ -	\$ 90	\$ -	\$ -	\$ -	\$ -	\$ 5	100%	\$90
77	CCB-13.5.3	Cottonwood Creek Tributary - Shooting Area Tributary (CCSP)	Requested in 2020	600 lf of stream reclamation	0.11	mi			100	lbs/mi	11	lbs/yr	Storm Flow	90%	10	lbs/year	\$ 300	\$ 720	\$ 108	\$ 612	\$ -	\$ -	\$ -	\$ 1	\$ 40	25%	\$180
78	CCB-13.5.4	Cottonwood Creek and Tributary C (IWSD)	Requested in 2020	2080 lf of stream reclamation	0.39	mi			100	lbs/mi	39	lbs/yr	Storm Flow	90%	35	lbs/year	\$ 1,664	\$ 2,496	\$ 374	\$ 2,122	\$ -	\$ -	\$ -	\$ 1	\$ 135	25%	\$624
79	CCB-16	Stream Corridor Preservation	No projects identified	Partner with others to purchase property or conservation easements along Cherry Creek												\$ 100	\$ 100	\$ -	\$ 100					\$ 5	100%	\$100	
80	CCB-17.2.1	Mountain and Lake Loop - 2021 Shoreline Maintenance	Identified during 2020 annual PRF observation	45 lf of bank stabilization	45	lf	0.1 cy/yr/ft		0.14	lbs/lf	6.3	lbs/yr	bank erosion	80%	5.04	lbs/yr	\$ 24	\$ 24	\$ -	\$ 24	\$ -	\$ -	\$ -	\$ 1	\$ 2	100%	\$24
81	CCB-17.5.1	East Shade Shelter Shoreline Stabilization Phase III	Identified during 2014 annual PRF inspection	400 lf of bank stabilization	400	lf	0.1 cy/yr/ft		0.14	lbs/lf	56.0	lbs/yr	bank erosion	80%	44.8	lbs/yr	\$ 906	\$ 975	\$ 184	\$ 791	\$ -	\$ -	\$ -	\$ 1	\$ 53	86%	\$842
82	CCB-17.7	Tower Loop Shoreline Stabilization Phase II	Identified during 2014 annual PRF inspection	700 lf of bank stabilization	700	lf	0.1 cy/yr/ft		0.14	lbs/lf	98.0	lbs/yr	bank erosion	80%	78.4	lbs/yr	\$ 1,076	\$ 1,035	\$ 155	\$ 880	\$ -	\$ -	\$ -	\$ 1	\$ 56	85%	\$880
83	CCB-21.1	Lone Tree Creek in CCSP downstream of Pond (CCBWQA Only)	Identified in 2014. Request from Arapahoe County Open Space.	500 lf of stream reclamation from CCSP Boundary to Cottonwood Creek	0.09	mi			100	lbs/mi	9	lbs/yr	Storm Flow	90%	9	lbs/yr	\$ 340	\$ 600	\$ 90	\$ 510	\$ -	\$ -	\$ -	\$ 1	\$ 33	100%	\$600

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				PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)		w/o cost sharing	w/cost sharing			
84	CCB-21.3 <i>Lone Tree Creek in CCSP upstream of Pond (Centennial Trail Portion)</i>	Request from Centennial for Participation in Stream Reclamation portion of Trail Project	710 lf of stream reclamation between CCSP Boundary and Windmill Creek Loop Trail	0.13	mi			100	lbs/mi	13	lbs/yr	Storm Flow	90%	12	lbs/yr	\$ 448	\$ 448	\$ -	\$ 448	\$ -	\$ -	\$ -	\$ -	\$ 1	\$ 25	25%	\$112
85	CCB-22.1 <i>Happy Canyon Creek at Jordan Road (SEMSWA)</i>	Requested in 2020	2,500 lf of stream reclamation, project extended another 2000 feet in 2022	0.85	mi			100	lbs/mi	85	lbs/yr	Storm Flow	90%	77	lbs/year	\$ 2,731	\$ 6,300	\$ 945	\$ 5,355	\$ -	\$ -	\$ -	\$ -	\$ 2	\$ 340	25%	\$1,575
86	CCB-23.1 <i>Dove Creek U/S Pond D-1 to Chambers Rd (SEMSWA)</i>	Requested in 2020	1300 lf of stream reclamation	0.25	mi			100	lbs/mi	25	lbs/yr	Storm Flow	90%	22	lbs/year	\$ 650	\$ 2,160	\$ -	\$ 2,160	\$ -	\$ -	\$ -	\$ -	\$ 1	\$ 117	25%	\$540
Proj. Designation	Project Title	Status	Description	Design Basis				Projected Loads		Projected Treatment			Cost Estimate (1000\$)							Unit Cost (\$/pound)		Note					
PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital from 2023 to 2032 CIP	Capital update to 2023 \$	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)	w/o cost sharing	w/cost sharing							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14a)	(14b)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)				
91	CCB-5.16B <i>Cherry Creek Stream Reclamation - Lake View Drive to North Side of DOLA (Reach 2 in Muller's 2022 Stream Assessment Report)</i>	Project w/in CCSP	Local stream stabilization (L=4400 ft.)	0.83	mi			100	lbs/mi	83.3	lbs/yr	Storm Flow	90%	75	lbs/year	\$ 5,612	\$ 7,920	\$ -	\$ -	\$ -	\$ 6	\$ 430	100%	\$5,612	\$ 5,738	\$ 5,738	
92	CCB-5.16C <i>Cherry Creek Stream Reclamation - North Side of DOLA to CCSP Boundaries (Reaches 3 Muller's 2022 Stream Assessment Report)</i>	Project w/in CCSP	Local stream stabilization (Cherry Creek Reach 3 L=6200 ft)	1.17	mi			100	lbs/mi	117.4	lbs/yr	Storm Flow	90%	106	lbs/year	\$ 10,054	\$ 11,160	\$ -	\$ -	\$ -	\$ 6	\$ 604	100%	\$10,054	\$ 5,715	\$ 5,715	
93	CCB-8 <i>Limestone Filter Enhancement</i>	Specific project not identified	Construct limestone filter bed downstream of retention pond	1.0	sq mi	n/a	10.7 af/year/sq mile	427	lbs/sq mi	427	lbs/yr	Base and storm flow	20%	85	lbs/year/mi ²	\$ 943	\$ 943	\$ -	\$ 595	\$ 1	\$ 83	43%	\$405	\$ 977	\$ 420		
94	CCB-11 <i>Advanced Water Treatment Plant</i>	Conceptual design prepared	Construct 2 MGD AWT plant on Cottonwood Creek to treat Cherry Creek and Cottonwood Creek flows (0.21-mg/ influent, 0.03 mg/l disch)	3	cfs	2-MGD	2260	0.21	mg/l	1272	lbs/yr	Base flow and groundwater	90%	1145	lbs/year	\$ 4,593	\$ 4,593	unknown	unknown	\$ 69		100%	\$4,593	\$ -	\$ -		
95	CCB-17.4.1 <i>East Boat Ramp Shoreline Stabilization Phase III</i>	Identified during 2012 annual PRF inspection	400 lf of bank stabilization	400	lf	0.1 cy/yr/ft		0.14	lbs/lf	56.0	lbs/yr	bank erosion	80%	44.8	lbs/yr	\$ 350	\$ 350	\$ -	\$ -	\$ -	\$ 4	\$ 23	100%	\$350	\$ 508	\$ 508	
96	CCB-17.6 <i>West Shade Shelter Shoreline Stabilization PRF¹⁴</i>	Identified initially in 2006. UCD Student Project w/WPR in 2013	1,400 lf of bank stabilization	1400	lf	0.1 cy/yr/ft		0.14	lbs/lf	196.0	lbs/yr	bank erosion	80%	179	lbs/yr	\$ 704	\$ 704	\$ -	\$ -	\$ -	\$ 2	\$ 51	65%	\$458	\$ 285	\$ 185	
97	CCB-17.8 <i>Dixon Grove Shoreline Stabilization Phase II</i>	Identified during 2019 annual PRF inspection	200 lf of bank stabilization	200	lf	0.1 cy/yr/ft		0.14	lbs/lf	28.0	lbs/yr	bank erosion	80%	22.4	lbs/yr	\$ 235	\$ 235	\$ -	\$ -	\$ -	\$ 1	\$ 14	100%	\$235	\$ 607	\$ 607	
98	CCB-18 <i>OWTS Sewer Service</i>	No action to date	Provide Sewer Service for OWTS Areas			To Be Determined				To Be Determined			To Be Determined									100%			To Be Determined		
99	CCB-19 <i>Non-point Pollutant Management</i>	No action to date	Assist agricultural contributors to water quality impact			To Be Determined				To Be Determined			To Be Determined			\$ 100	\$ 100	\$ -	\$ -	\$ -	\$ -	\$ 5	100%	\$100		To Be Determined	

BASIS FOR ANALYSIS:

(A) Unit cost of phosphorus removal based on annualized cost of completed project over 35 years at 4% interest rate. **CRF = 0.053577**

(B) All projects identified provide for additional phosphorus immobilization beyond minimum requirements, unless noted otherwise.

2024 CIP NOTES:

- Assumed that augmentation for consumptive use not required
- Augmentation for naturally established wetlands not required (assumption)
- Phosphorus Estimated based on Interim Stream Reclamation Paper
- See 2020 Cattail Harvesting Pilot Project Memo. Phosphorus estimated based on SEMSWA 2020 Data.
- Pond updates to bring up to current standards and to facilitate maintenance. No phosphorus calculation provided, since ponds already exist.
- Updated O&M Cost to \$6k per mile (increased use for projects in CCSP)with a minimum of \$1k.
- Updated O&M Cost to \$2k per mile with a minimum of \$1k
- Water costs at \$ 6,500 per acre foot
- Present worth of capital replacement
- Land acquisition and water augmentation not defined. CWSD\ACWWA JWPP project influenced scope of project.

REFERENCES

- Muller Eng 2003. *Feasibility Evaluation for Cherry Creek State Park Wetlands Project*
- Muller Eng 2003. *Feasibility Evaluation for Cottonwood Creek Stream Stabilization Project*
- AMEC 2005. *Draft Feasibility Report Cherry Creek Reservoir Destratification*
- AMEC 2006. *Recommendations for Prepurchase of Jamor Equipment for Cherry Creek Reservoir Destratification Project.*
- Tetra Tech August 2006. *Phosphorus Estimates in Cherry Creek and Cost for Removal via Sediment Trap.*
- WERF 2000. *Phosphorus Credit Trading in the Cherry Creek Basin: An Innovative Approach to Achieving Water Quality Benefits.*
- Ruzzo, WP September 5, 2003. *Cherry Creek Corridor Master Plan-Estimate of Phosphorus Reduction from Stream Reclamation*
- Ruzzo, W. P. September 21, 2006. *Cottonwood Creek Reclamation - Water Rights Augmentation Requirements.*
- TetraTech December 2006. *Design of Cherry Creek Sediment Basin and Stream Stabilization.*
- Brown and Caldwell Feb 2007. *Shop Creek Wetlands Pollutant Reduction Facility Wetland Assessment*
- PBSJ October 2006. *Draft McMurdo Gulch Major Drainageway Master Plan*

CHERRY CREEK BASIN WATER QUALITY AUTHORITY
TABLE 1 - SUMMARY OF POTENTIAL POLLUTANT REDUCTION FACILITIES
REVISIONS FOR 2024 - 2033 CIP

Date: September 26, 2023

Color Code: Blue: Project Completed

Green: Planned for design/construction during 5-year period

*

Updated based on 2023 total project cost and stream length information. O&M costs adjusted to be similar cost baseline. Projects that were bid/constructed in phases, were separated into those phases to facilitate adjustment to 2023 costs on PRFs for WQ Analysis.

Please see comment for more information and include in presentation to TAC and Board.

Projects highlighted so that original project information compared with updated project information (denoted with *).

Project under consideration for additional funding from CCBWQA in 2023, final option will be included in CIP when funding decision and direction are received from TAC and Board.

Proj. Designation	Project Title	Status	Description				Design Basis				Projected Loads	Projected Treatment		Cost Estimate (1000\$)							Unit Cost (\$/pound)		Note					
			PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source		Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)	w/o cost sharing		w/cost sharing				
119	12. Total Phosphorus loading derived from laboratory sediment samples & Stantec Geomorphic Study BANCS analysis.																											
120	15. Estimate based on costs for similar work along East Shoreline dating back to 1996																											
121	16. Benefit approximated based on other shoreline projects and estimates																											
122	17. Loads and performance based on calculations for 3 McMurdo Gulch ponds.																											
123	18. SEO opined that ET must be augmented. Also, recent Reservoir fluctuations may render project infeasible. Placed on indefinite hold.																											
124	19. Approach was shifted to focus on stream reclamation (CCB-5.14) and reduction of sediment and nutrient sources from erosion.																											
125	20. Joint project with CCSP. Integrate design with Dog Park uses and improvements.																											
126	Estimate based on similar stream stabilization projects																											
127	21. Phosphorus: Shoreline 177 lbs/yr + Parking Lot 2 lbs/yr = 179 lbs/yr																											
128																												

CHERRY CREEK BASIN WATER QUALITY AUTHORITY
TABLE 2 - SUMMARY OF RECOMMENDED POLLUTANT REDUCTION FACILITIES
2024 - 2033 BUDGET PROJECTIONS (1000\$)

Color Code: Please see comment for more information and mention while presenting.
 Projects with potential funding moved from 2024 to 2023.
 Haven't received input as of 9/26/23 from Partners on possible CIP schedule and cost changes

		September 26, 2023					Contributions in 2021 or Older	Residual PRF Costs	2022 Budget				Residual PRF Costs	Proposed 2023 Budget				Residual PRF Costs	Proposed 2024 Budget				Proposed 2025 Budget	Proposed 2026 Budget	Proposed 2027 Budget	Proposed 2028 Budget	Proposed 2029 Budget	Proposed 2030 Budget	Proposed 2031 Budget	Proposed 2032 Budget	Proposed 2033 Budget	2024-2033 Total
Project No.	Project Title	Total	Authority Portion	Authority Portion		Design			Capital	Land	Total	Design		Capital	Water	Total	Design		Capital	Land	Total	Total										
Budget Category - General																																
Budget Category - Reservoir Projects																																
CCR-2	Reservoir Destratification System - Distribution Preliminary Design - Includes evaluation of Optimization of Distribution with WWE Expansion Alternative	\$ 2,140	\$ 2,140	100%	\$ -	\$ 2,140	\$ -	\$ -	\$ -	\$ -	\$ 2,140	\$ -	\$ -	\$ -	\$ -	\$ 2,140	\$ 270	\$ -	\$ -	\$ 270	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 935	\$ 935	\$ -	\$ -	\$ 2,140	
CCB-17.5.1	East Shade Shelter Shoreline Stabilization Phase III	\$ 975	\$ 842	86%	\$ 141	\$ 701	\$ -	\$ -	\$ -	\$ -	\$ 701	\$ 43	\$ -	\$ -	\$ 43	\$ 658	\$ -	\$ 658	\$ -	\$ 658	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 658	
CCB-17.7	Tower Loop Shoreline Stabilization Phase II	\$ 1,035	\$ 1,035	100%	\$ -	\$ 1,035	\$ -	\$ -	\$ -	\$ -	\$ 1,035	\$ -	\$ -	\$ -	\$ -	\$ 1,035	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 155	\$ 880	\$ 1,035	
Budget Category - Stream Reclamation Projects																																
CCB-5.4	Cherry Creek Stream Reclamation at Main Street (Parker)	\$ 5,600	\$ 1,400	25%	\$ -	\$ 1,400	\$ -	\$ -	\$ -	\$ -	\$ 1,400	\$ -	\$ -	\$ -	\$ -	\$ 1,400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 700	\$ 700	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,400	
CCB-5.6	Cherry Creek Stream Stabilization at Lincoln Avenue (Parker)	\$ 3,290	\$ 823	25%	\$ -	\$ 823	\$ -	\$ -	\$ -	\$ -	\$ 823	\$ -	\$ -	\$ -	\$ -	\$ 823	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 411	\$ 412	\$ -	\$ -	\$ 823		
CCB-5.14C	Cherry Creek Stream Reclamation - Valley Country Club to Soccer Fields (Reaches 3 and 4)	\$ 10,600	\$ 2,650	25%	\$ 25	\$ 2,625	\$ 226	\$ -	\$ -	\$ 226	\$ 2,399	\$ -	\$ 300	\$ -	\$ 300	\$ 2,099	\$ -	\$ 300	\$ -	\$ 300	\$ 350	\$ 400	\$ 600	\$ 449	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,099		
CCB-5.16A	Cherry Creek - Reservoir to Lake View Drive Alternatives Analysis	\$ 467	\$ 467	100%	\$ -	\$ 467	\$ -	\$ -	\$ -	\$ -	\$ 467	\$ 257	\$ -	\$ -	\$ 257	\$ 210	\$ 181	\$ -	\$ -	\$ 181	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 181	
CCB-5.16A	Cherry Creeks Reach 1 in CCSP	\$ 11,846	\$ -	0%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 650	\$ 650	\$ 650	\$ 650	\$ 650	\$ 650	\$ 650	\$ 650	\$ 675	\$ 698	\$ 5,923	
CCB-6.5	Piney Creek Reach 1 to 2 (SEMSWA)	\$ 4,060	\$ 1,015	25%	\$ -	\$ 1,015	\$ 38	\$ -	\$ -	\$ 38	\$ 977	\$ 63	\$ -	\$ -	\$ 63	\$ 914	\$ 39	\$ -	\$ -	\$ 39	\$ 25	\$ 75	\$ 150	\$ 125	\$ 125	\$ 125	\$ 125	\$ 125	\$ 125	\$ -	\$ 914	
CCB-6.6	Piney Creek Tower to Orchard (SEMSWA)	\$ 5,320	\$ 1,330	25%	\$ -	\$ 1,330	\$ -	\$ -	\$ -	\$ -	\$ 1,330	\$ -	\$ -	\$ -	\$ -	\$ 1,330	\$ -	\$ 75	\$ -	\$ 75	\$ 150	\$ 235	\$ 250	\$ 250	\$ 250	\$ 250	\$ 120	\$ -	\$ -	\$ -	\$ 1,330	
CCB-7.4	McMurdo Gulch Reclamation (Castle Rock)	\$ 5,162	\$ 1,292	25%	\$ -	\$ 1,292	\$ 171	\$ -	\$ -	\$ 171	\$ 1,121	\$ -	\$ -	\$ -	\$ -	\$ 1,121	\$ -	\$ -	\$ 1,121	\$ 1,121	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,121	
CCB-13.5.3	Cottonwood Creek Tributary - Shooting Area Tributary (CCSP)	\$ 720	\$ 180	25%	\$ -	\$ 180	\$ -	\$ -	\$ -	\$ -	\$ 180	\$ -	\$ -	\$ -	\$ -	\$ 180	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 180	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 180		
CCB-13.5.4	Cottonwood Creek and Tributary C (IWS)	\$ 2,496	\$ 624	25%	\$ -	\$ 624	\$ -	\$ -	\$ -	\$ -	\$ 624	\$ -	\$ -	\$ -	\$ -	\$ 624	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 416	\$ -	\$ -	\$ -	\$ 416	
CCB-21.1	Lone Tree Creek in CCSP downstream of Pond (CCBWQA Only)	\$ 600	\$ 600	100%	\$ -	\$ 600	\$ -	\$ -	\$ -	\$ -	\$ 600	\$ -	\$ -	\$ -	\$ -	\$ 600	\$ 120	\$ -	\$ -	\$ 120	\$ 480	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 600	
CCB-21.3	Lone Tree Creek in CCSP upstream of Pond (Centennial Trail Portion)	\$ 448	\$ 112	25%	\$ -	\$ 112	\$ -	\$ -	\$ -	\$ -	\$ 112	\$ -	\$ -	\$ -	\$ -	\$ 112	\$ -	\$ 112	\$ -	\$ 112	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 112	
CCB-22.1	Happy Canyon Creek at Jordan Road (SEMSWA)	\$ 6,300	\$ 1,575	25%	\$ 25	\$ 1,550	\$ 68	\$ -	\$ -	\$ 68	\$ 1,482	\$ -	\$ 88	\$ -	\$ 88	\$ 1,394	\$ -	\$ 50	\$ -	\$ 50	\$ 75	\$ 75	\$ 171	\$ 170	\$ 170	\$ 170	\$ 170	\$ 170	\$ 173	\$ 1,394		
CCB-23.1	Dove Creek U/S Pond D-1 to Chambers Rd (SEMSWA)	\$ 2,160	\$ 540	25%	\$ -	\$ 540	\$ -	\$ -	\$ -	\$ -	\$ 540	\$ -	\$ -	\$ -	\$ -	\$ 540	\$ -	\$ 540	\$ -	\$ 540	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 540		
Budget Category - PRF Water Quality/Wetland Ponds																																
Budget Category - PRF Preservation, Acquisition, Lease																																
CCB-16	PRF Preservation, Acquisition, Lease of Land or Water	\$ 1,000	\$ 1,000	100%	\$ -	\$ 1,000	\$ -	\$ -	\$ -	\$ -	\$ 1,000	\$ -	\$ 100	\$ -	\$ 100	\$ 900	\$ -	\$ 100	\$ -	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 1,000		
SUB-TOTALS						\$ 17,434				\$ 503					\$ 851					\$ 3,566	\$ 1,830	\$ 1,535	\$ 2,621	\$ 2,624	\$ 1,295	\$ 2,927	\$ 2,392	\$ 1,225	\$ 1,851	\$ 21,866		
Revised Total with Projects moved from 2024 to 2023																				\$ 2,875												

CHERRY CREEK BASIN WATER QUALITY AUTHORITY
TABLE 2 - SUMMARY OF RECOMMENDED POLLUTANT REDUCTION FACILITIES
2024 - 2033 BUDGET PROJECTIONS (1000\$)

Color Code: Please see comment for more information and mention while presenting.
 Projects with potential funding moved from 2024 to 2023.

Haven't received input as of 9/26/23 from Partners on possible CIP schedule and cost changes

September 26, 2023		2022 Budget				Residual PRF Costs	Proposed 2023 Budget				Residual PRF Costs	Proposed 2024 Budget				Proposed 2025 Budget	Proposed 2026 Budget	Proposed 2027 Budget	Proposed 2028 Budget	Proposed 2029 Budget	Proposed 2030 Budget	Proposed 2031 Budget	Proposed 2032 Budget	Proposed 2033 Budget	2024-2033 Total				
Project No.	Project Title	Total	Authority Portion	Authority Portion	Contributions in 2021 or Older	Residual PRF Costs	Design	Capital	Land	Total	Design	Capital	Water	Total	Design	Capital	Land	Total	Total	Total	Total	Total	Total	Total	Total	Total			
	OPERATIONS AND MAINTENANCE																												
	Routine Category																												
38	OM-7 Reservoir Destratification	\$ 350	\$ 350	100%			\$ 27			\$ 27		\$ 35		\$ 35					\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 400	
39	OM-14.1 PRF Weed Control	\$ 100	\$ 100	100%			\$ 8			\$ 8		\$ 10		\$ 10					\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 100	
40	OM-14.2 PRF Reseeding at CCSP	\$ 50	\$ 27	100%			\$ -			\$ -		\$ 5		\$ 5					\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 50	
41	OM-14.3 PRF Mowing	\$ 50	\$ 45	100%			\$ -			\$ -		\$ 5		\$ 5					\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 50	
42	SUB-TOTAL	\$ 550	\$ 522				\$ 35			\$ 35		\$ 55		\$ 55					\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 600	
43	Operations Category																												
44	O - 1 RDS Utilities	\$ 650	\$ 650	100%			\$ 60			\$ 60		\$ 65		\$ 65					\$ 65	\$ 65	\$ 65	\$ 65	\$ 65	\$ 65	\$ 65	\$ 65	\$ 65	\$ 650	
45	O - 2 RDS Service Plan	\$ 155	\$ 155	100%			\$ 11			\$ 11		\$ 12		\$ 12					\$ 13	\$ 14	\$ 15	\$ 16	\$ 17	\$ 18	\$ 19	\$ 20	\$ 20	\$ 172	
46	O - 3 PRF Emergency Repairs	\$ -	\$ -	100%			\$ 90			\$ 90		\$ -		\$ -					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
47	O - 4 Meteorological Station	\$ 36	\$ 36	100%			\$ 6			\$ 6		\$ 3		\$ 3					\$ 3	\$ 3	\$ 3	\$ 3	\$ 3	\$ 3	\$ 3	\$ 3	\$ 3	\$ 30	
48	SUB-TOTAL	\$ 841	\$ 841				\$ 167			\$ 167		\$ 80		\$ 80					\$ 81	\$ 82	\$ 83	\$ 84	\$ 85	\$ 86	\$ 87	\$ 88	\$ 88	\$ 852	
49	Restorative Category																												
50	OM - Tree/Shrub Planting	\$ 18	\$ 18	100%			\$ -			\$ -		\$ -		\$ -					\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 20	
51	OM - Fence Repair	\$ 72	\$ 72	100%			\$ -			\$ -		\$ -		\$ -					\$ 8	\$ 8	\$ 8	\$ 8	\$ 8	\$ 8	\$ 8	\$ 8	\$ 8	\$ 80	
52	OM - Shoreline / Bank Restoration																												
53	Average Annual Cost	\$ -	\$ -				\$ -			\$ -		\$ -		\$ -					\$ 195	\$ 195	\$ 195	\$ 195	\$ 195	\$ 195	\$ 195	\$ 195	\$ 195	\$ 1,950	
54	Shop Creek Concrete Repairs	\$ 10	\$ 10				\$ -			\$ -		\$ 10		\$ 10					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
55	Mountain/Lake Loop Shoreline	\$ 24	\$ 24	100%			\$ 24			\$ 24		\$ 30		\$ 30					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
56	OM - Wetland Harvesting	\$ 900	\$ 900	100%			\$ 90			\$ 90		\$ 90		\$ 90					\$ 90	\$ 90	\$ 90	\$ 90	\$ 90	\$ 90	\$ 90	\$ 90	\$ 90	\$ 900	
57	SUB-TOTAL	\$ 1,024	\$ 1,024				\$ 114			\$ 114		\$ 130		\$ 130					\$ 295	\$ 295	\$ 295	\$ 295	\$ 295	\$ 295	\$ 295	\$ 295	\$ 2,950		
58	Rehabilitation Category																												
59	OM -			100%																									
60	SUB-TOTAL	\$ -	\$ -				\$ -			\$ -		\$ -		\$ -					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
61																													
62	SUB-TOTAL O&M						\$ 316			\$ 316		\$ 265		\$ 265					\$ 436	\$ 437	\$ 438	\$ 439	\$ 440	\$ 441	\$ 442	\$ 443	\$ 443	\$ 4,402	
63	GRAND TOTAL						\$ 819			\$ 819		\$ 1,116		\$ 1,116					\$ 4,002	\$ 2,267	\$ 1,973	\$ 3,060	\$ 3,064	\$ 1,736	\$ 3,369	\$ 2,835	\$ 1,668	\$ 2,294	\$ 26,268

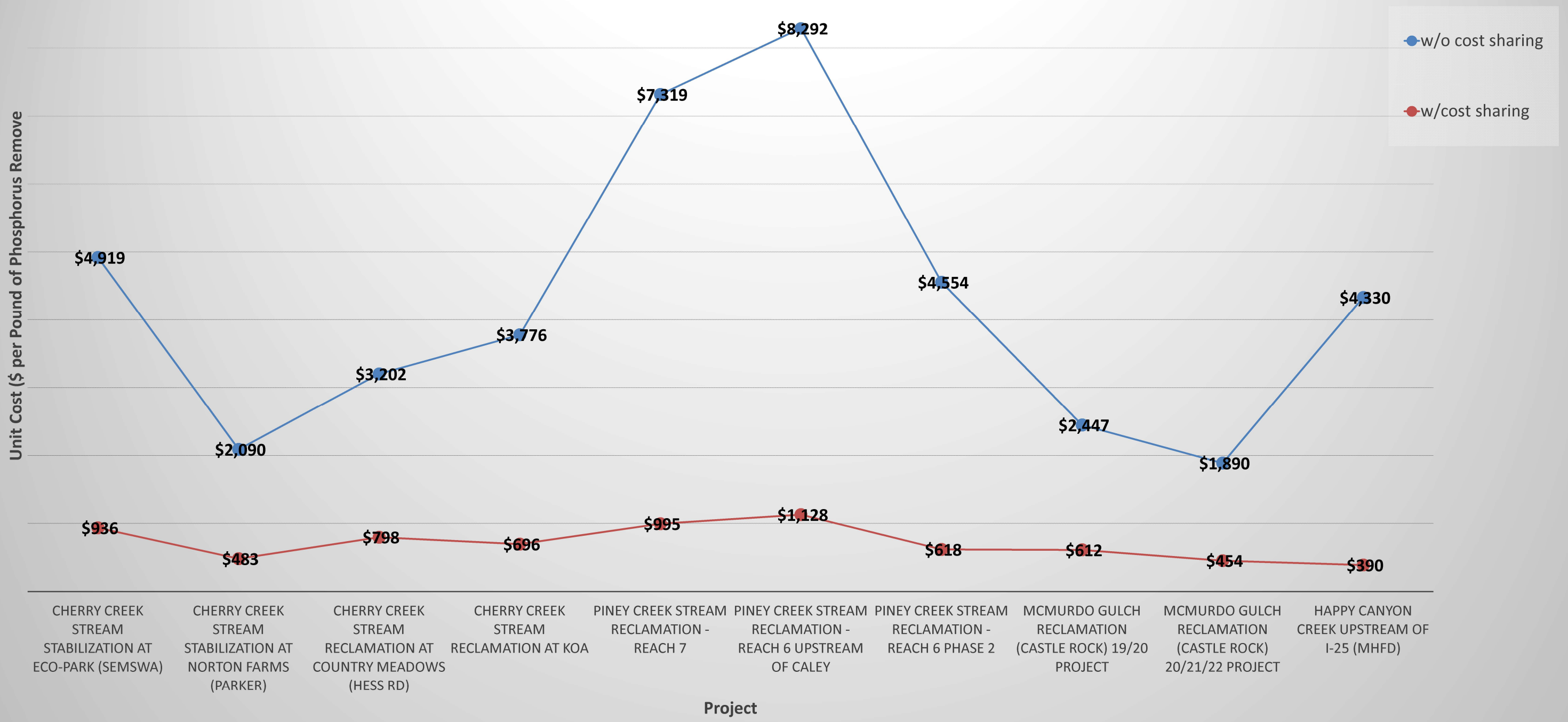
CHERRY CREEK BASIN WATER QUALITY AUTHORITY
TABLE 3 - SUMMARY OF POTENTIAL POLLUTANT REDUCTION FACILITIES
REVISIONS FOR 2024 - 2033 CIP

Date: **September 26, 2023**
 Color Code: **Blue: Project Completed**

Projects with best total project cost and stream length information, on similar maintenance cost baseline, and adjusted to September 2023 cost basis

16	Proj. Designation	Project Title	Status	Description	Design Basis				Projected Loads		Projected Treatment		Cost Estimate (1000\$)										Unit Cost (\$/pound)		Adjusted to 2023 \$					Note		
					PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)	w/o cost sharing	w/cost sharing	Bid Date/Construction Date	ENR Factor	Construction Cost	w/o cost sharing	w/cost sharing			
17	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14a)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)						(24)			
19	CCB-5.7*	Cherry Creek Stream Stabilization at Eco-Park (SEMSWA)	IGA w/SEMSWA for design in 2010 and construction in 2011/2012	Local stream stabilization (L = 4850 ft)	0.92	mi		100	lbs/mi	92	lbs/yr	Storm Flow	90%	83	lbs/year	\$ 4,756	\$ -	\$ -	\$ -	\$ 2	\$ 257	19%	\$905	\$ 3,106	\$ 591	August 2012	1.58	\$ 7,531	\$ 4,919	\$ 936	1, 2	
20	CCB-5.11*	Cherry Creek Stream Stabilization at Norton Farms (Parker)	Conceptual design by UDFCD identified priority 3	Local stream stabilization (L = 2500 ft)	0.47	mi		100	lbs/mi	47	lbs/yr	Storm Flow	90%	43	lbs/year	\$ 1,103	\$ -	\$ -	\$ -	\$ 1	\$ 60	23%	\$255	\$ 1,410	\$ 326	January 2016	1.48	\$ 1,634	\$ 2,090	\$ 483	1, 2	
21	CCB-5.15*	Cherry Creek Stream Reclamation at Country Meadows (Hess Rd)	Project by Town of Parker and Douglas County	Local stream stabilization (L = 4200 ft)	0.80	mi		100	lbs/mi	80	lbs/yr	Storm Flow	90%	72	lbs/year	\$ 2,788	\$ -	\$ -	\$ -	\$ 2	\$ 151	25%	\$695	\$ 2,114	\$ 527	October 2014	1.51	\$ 4,222	\$ 3,202	\$ 798	1, 2	
22	CCB-5.17.1A*	Cherry Creek Stream Reclamation at KOA	Preliminary design completed 2019, Extension Requested by UDFCD and Parker in 2019	Local stream stabilization (L=1400 ft original, L=2000 ft with 600 ft extension)	0.38	mi		100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 1,806	\$ -	\$ -	\$ -	\$ 1	\$ 98	18%	\$333	\$ 2,868	\$ 529	July 2020	1.32	\$ 2,378	\$ 3,776	\$ 696	1, 2	
23	CCB-6.4A *	Piney Creek Stream Reclamation - Reach 7	Request from UDFCD in 2014	Local stream stabilization (L = 2,340 ft)	0.44	mi		100	lbs/mi	44	lbs/yr	Storm Flow	90%	40	lbs/year	\$ 3,765	\$ -	\$ -	\$ -	\$ 1	\$ 203	14%	\$512	\$ 5,082	\$ 691	December 2016	1.44	\$ 5,422	\$ 7,319	\$ 995	1, 2	
24	CCB-6.4B.1 *	Piney Creek Stream Reclamation - Reach 6 upstream of Caley	Request from UDFCD in 2014	Local stream stabilization (L = 1,600 ft)	0.30	mi		100	lbs/mi	30	lbs/yr	Storm Flow	90%	27	lbs/year	\$ 2,896	\$ -	\$ -	\$ -	\$ 1	\$ 156	14%	\$394	\$ 5,726	\$ 779	November 2016	1.45	\$ 4,194	\$ 8,292	\$ 1,128	1, 2	
25	CCB-6.4B.2 *	Piney Creek Stream Reclamation - Reach 6 Phase 2	Request from UDFCD in 2014	Local stream stabilization (L = 2,580 ft)	0.49	mi		100	lbs/mi	49	lbs/yr	Storm Flow	90%	44	lbs/year	\$ 2,659	\$ -	\$ -	\$ -	\$ 1	\$ 143	14%	\$361	\$ 3,262	\$ 443	November 2017	1.40	\$ 3,712	\$ 4,554	\$ 618	1, 2	
26	CCB-7.2 *	McMurdo Gulch Reclamation (Castle Rock) 19/20 Project	Design in 2019, Construction in 2020	Stream Reclamation (L = 2,000 lf)	0.38	mi		100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 1,156	\$ -	\$ -	\$ -	\$ 1	\$ 63	25%	\$289	\$ 1,846	\$ 462	February 2020	1.33	\$ 1,532	\$ 2,447	\$ 612	1, 2	
27	CCB-7.3 *	McMurdo Gulch Reclamation (Castle Rock) 20/21/22 Project	Design in 2020, Construction 2021	Stream Reclamation (L = 3,700 lf)	0.70	mi		100	lbs/mi	70	lbs/yr	Storm Flow	90%	63	lbs/year	\$ 1,940	\$ -	\$ -	\$ -	\$ 1	\$ 105	24%	\$466	\$ 1,664	\$ 400	November 2021	1.14	\$ 2,204	\$ 1,890	\$ 454	1, 2	
28	CCB-22.2*	Happy Canyon Creek Upstream of I-25 (MHFD)	Requested in 2020	3000 lf of stream reclamation	0.57	mi		100	lbs/mi	57	lbs/yr	Storm Flow	90%	51	lbs/year	\$ 4,021	\$ -	\$ -	\$ -	\$ 1	\$ 216	9%	\$362	\$ 4,232	\$ 381	May 2023	1.02	\$ 4,114	\$ 4,330	\$ 390	1, 2	
29																							Calculated 25% CCBWQA Funding Threshold					Calculated 25% CCBWQA Funding Threshold				
30																							Minimum = \$ 1,410 \$ 326					Minimum = \$ 1,890 \$ 390				
31																							Maximum = \$ 5,726 \$ 779					Maximum = \$ 8,292 \$ 1,128				
32																							Mean = \$ 2,975 \$ 513 \$ 744					Mean = \$ 4,064 \$ 711 \$ 1,016				
33																							Median = \$ 2,987 \$ 494					Median = \$ 4,053 \$ 657				
34																							Standard Deviation = \$ 1,477 \$ 142					Standard Deviation = \$ 2,137 \$ 248				

Figure 2 - Stream Reclamation outside of CCSP



CHERRY CREEK BASIN WATER QUALITY AUTHORITY
2023 Capital Project Status Report
September 15, 2023

RESERVOIR PROJECTS

1. East Shade Shelters Phase III and Tower Loop Phase II Shoreline Stabilization (CCB-17.5 and CCB-17.7)
 - a. Description: These projects were identified in 2014 through the annual inspection. The Tower Loop Phase II connects to the Phase I project and extends shoreline protection 570 feet to the southeast towards Dixon Grove. The East Shade Shelters Phase III starts on the north end of the Shade Structure and goes 400-feet to the south.
 - b. Status: Consultant selection is scheduled for the 1st quarter. A consultant selection committee will be set in February (1/29/21). At the February TAC meeting Jason Trujillo, Jon Erickson, Lanae Raymond, Bill Ruzzo were interested in serving on the consultant selection committee (2/11/21). This selection committee was discussed at the 3/18/21 Board Meeting, and no further members were added. The Request for Proposals (RFP) has been posted on BidNet and Proposals are due 04/21/21 (3/25/21). The pre-proposal meeting was held on 4/7/21. 5 proposals were received on 4/28/21; the selection committee is reviewing them. Interviews were held and a selection is being brought to the May Board meeting (5/14/21). Board authorized negotiations with RESPEC (5/27/21). Agreement has been executed with RESPEC (10/15/21). Field Survey of project areas and topographic mapping is underway (12/30/21). A design kickoff meeting was held on 4/22/22. A design sprint workshop was held on 7/12/22 which included a site visit and evaluation of alternatives. RESPEC is developing a recommended alternative (9/8/22). RESPEC provided updated project costs for budgeting (10/13/22). The 30% submittal was received on 11/16/22 and is under review. CCBWQA provided comments on 30% review on 1/17/23; a value engineering effort is recommended as the project costs exceed the budget. The value engineering meeting was held on 2/24/23. RESPEC's request for additional services was approved by TAC and Board in May (5/25/23). The reservoir water level has come down since the May and June storms and additional erosion was observed on 7/14/23; a site visit was made with RESPEC on 8/1/23 and the erosion areas at East Shade Shelters were measured. *It has been estimated that roughly 14 cubic yards of soil was eroded from the 2023 storms (9/15/23). A progress meeting was held on 9/15/23, RESPEC will refine the breakout of components between recreational (CPW responsibility), water quality (CCBWQA responsibility), and shared (both CPW and CCBWQA responsibilities) costs and work on 408 review submittal to US Army Corps of Engineers.*

STREAM RECLAMATION PROJECTS

1. Cherry Creek Stream Reclamation at Arapahoe Road aka Reaches 3 and 4 (CCB-5.14C)
 - a. Description: This project continues the work on Cherry Creek by CCBWQA, MHFD, and local partners. It ties into the previous stream reclamation projects of Cherry Creek Eco Park to Soccer Fields (CCB-5.14A) and Cherry Creek at Valley Country Club (CCB-5.14B). The 5,167 Linear Feet of stream reclamation reduces bed and bank erosion immobilizing approximately 88 pounds of phosphorus annually. The project is anticipated to be funded over several years and likely be broken into phases.
 - b. Status: In 2021, 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. It appears that CCBWQA's 2023 participation will be reduced as a result of less

partner funding available for this project (2/24/23). The IGA Amendment that brings in 2023 funding was recommended by the TAC and authorized by the Board at their June meetings (6/29/23).

2. Cherry Creek Stream Reclamation – Upstream of Scott Road (CCB-5.17)
 - a. Description: Design and construction of stream reclamation is in partnership with Douglas County and MHFD. It improves 4,100 feet of Cherry Creek and is located upstream of Scott Road.
 - b. Status: IGA was approved by the Board at their April 2020 meeting. Muller had been selected as consultant, and design scope of work is being prepared. Kickoff meeting was held on 12/11/20; a follow-up field visit will be scheduled for early 2021. Site visit was held on 1/29/21. Conceptual design is complete, negotiations are underway to contract for 60% design (4/8/21). Muller is working on alternatives (4/30/21). Muller is working on preliminary design and an IGA Amendment to bring in additional 2021 funding from Douglas County is being brought to the Board in October (10/15/21); IGA Amendment has been executed (11/11/21). Muller is preparing 60% Design Submittal (1/28/22). Muller submitted 60% Design on 2/2/22; comments have been provided on 60% Design Submittal (3/10/22). IGA Amendment bringing in 2022 funding is scheduled for TAC and Board consideration in June (5/27/22). IGA Amendment was authorized at the June 16th Board Meeting (6/30/22). Muller is working on Final Design and held a progress meeting on 4/14/23, a site visit is being scheduled to support the 90% design submittal. The 90% site visit was held on 5/22/23. *Muller submitted their 90% design submission on 9/14/23; the engineer's estimate confirms that additional funding is needed for construction.*
3. Cherry Creek Stream Reclamation at Dransfeldt (CCB-5.17.1B)
 - a. Description: Design and construction of stream reclamation is in partnership with Town of Parker and MHFD. It improves 2,400 feet of Cherry Creek near the future location of Dransfeldt bridge which is just downstream of the Cherry Creek at KOA project.
 - b. Status: Initial scoping has begun, and a partners meeting was held on 1/30/21. IGA is scheduled for CCBWQA's May TAC and Board meetings (4/30/21). IGA was approved by all parties and has been executed (6/25/21). Muller Engineering has submitted their Draft Scope of Work for Design Services, and the project sponsors have reviewed it (7/8/21). Design kickoff meeting was held on 10/14/21. Alternatives are being evaluated (12/9/21). Pre-submittal meeting for the 404 permit is being scheduled (12/30/21). CLOMR is being prepared for project (3/10/22) and was submitted to FEMA on 3/31/22. CEI was selected for as project partner to provide contractor input during the design (5/27/22). CLOMR is under review by FEMA (8/12/22). Muller has received comments on CLOMR and is preparing responses; 90% Submittal is scheduled for early February (1/27/23). Comments on 90% Submittal were provided on 2/22/23; project is experiencing substantive cost increases due to current market conditions (2/24/23). TAC at their 3/2/23 meeting recommended that the Board authorized the IGA Amendment to bring in 2023 funding along with an increase in CCBWQA's 2023 funding from \$170,000 to \$570,000. The Board authorized the IGA Amendment with the increased 2023 funding of \$570,000 at their 3/16/23 meeting. The Conditional Letter of Map Revision (CLOMR) was issued by the Federal Emergency Management Agency (FEMA) on April 28, 2023 (5/12/23). The sanitary sewer relocation will be contracted to start with, in order to avoid a pipe material cost increase, and to get it out of the way for the forthcoming stream reclamation (7/13/23). The sanitary sewer relocation has been contracted for with Concrete Express Inc. or CEI (8/11/23).
4. McMurdo Gulch Priority 3 Stream Reclamation (CCB-7.2)
 - a. Description: The design and construction of stream reclamation is in partnership with Castle Rock. Castle Rock is the lead agency. This phase continues the work from the previous phase. Muller Engineering is the design consultant.
 - b. Status: Board authorized IGA for Priority 3 at their May 19,2022 meeting. Muller submitted their 30% deliverable on 10/31/22, review comments were returned on 11/8/22. Easements needed for projects have been identified (1/23/22). The 60% Submittal was received on

1/30/23 and comments have been provided on 2/7/23. Muller is working on updating their construction cost estimate (2/8/23). On 2/23/23, Castle Rock requested that CCBWQA's 2023 funding be deferred to 2024 to match their schedule.

5. Lone Tree Creek in Cherry Creek State Park (CCB-21.1)
 - a. Description: This project includes a trail connection to Cherry Creek State Park and includes 570 linear feet of stream reclamation on Lone Tree Creek from the State Park Boundary to the Windmill Creek Loop Trail. The City of Centennial is the project lead. CCBWQA participation is for 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. A Memo of Understanding is under review by Colorado Parks and Wildlife (CPW) affirming maintenance responsibilities for the stream reclamation fit under the current agreement between CCBWQA and CPW (3/30/23). CCBWQA sent the Draft IGA to Centennial for review on 5/23/23.

6. Happy Canyon Creek – County Line to Confluence with Cherry Creek (aka Jordan Road, CCB-22.1)
 - a. Description: The design and construction are in partnership with Southeast Metro Stormwater Authority and MHFD and includes 2,500 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$325,000. The total project cost is estimated at \$1,300,000.
 - b. Status: IGA is scheduled for June TAC and Board meetings (5/27/21). IGA has been approved and executed by all parties (7/29/21). Jacobs has been selected as design consultant and project scoping is underway; limits have been extended upstream to the County Line and sediment capture area and transport will be included with the project (10/15/21). Jacobs has submitted their scope of work and fee for design which is under review by project sponsors (11/11/21). Project sponsors have completed a review of Jacobs' fee and scope of work and the agreement is being routed for signatures (1/28/22). IGA Amendment to bring in 2022 funding is in process (3/10/22). A project kickoff meeting was held on 3/28/2022. A site visit was performed on 4/12/22 to document existing conditions and identify sediment source/transport/deposition areas. Project Team is preparing a sampling plan for bank and bed materials to determine phosphorous content (5/13/22). The project team met on 5/24/22 to discuss project goals and Jacobs is progressing through the study. Jacobs and ERC are working on sediment transport analysis and model (6/30/22). The results from the sediment transport model were presented at the 8/23/22 progress meeting and an upstream sediment capture area just south of the JWPP was included in the alternatives analysis (8/26/22). The alternative analysis report is expected to be completed before the end of 2022 (10/13/22). Lab results from stream soil samples were sent to Jacobs so that they include phosphorus reduction in the alternatives analysis report; a groundwater investigation is needed to inform sediment capture facility and stream reclamation alternatives, scoping and negotiations are in progress (11/11/22). Groundwater scope of work has been reviewed and approved by project sponsors (1/13/23). The IGA Amendment bringing in the 2023 funding was recommended by TAC and authorized by the Board in April (5/12/23).

7. Happy Canyon Creek - Upstream of I-25 (CCB-22.2)
 - a. Description: The design and construction are in partnership with Douglas County, City of Lone Tree, and MHFD and includes 2,500 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$500,000. The total project cost is estimated at \$2,000,000.
 - b. Status: Douglas County, City of Lone Tree, and MHFD have initially funded and selected

Muller Engineering as the design engineer. Design has started and a progress meeting was held on 1/27/21. Design is progressing (2/11/21). Muller has submitted 60% Design Deliverables (5/27/21). IGA for 2021 Funding is being brought to Board in September (9/9/21). 2021 IGA Amendment has been executed (11/11/21). Coordination with CDOT and easement acquisitions are on-going (1/13/22). Board authorized 2022 funding and IGA Amendment at their June 16th meeting (6/30/22). The project received environmental clearance from CDOT (8/12/22). The 90% design submittal is scheduled for delivery by end of September (8/26/22). The 90% design submittal is being reviewed (10/13/22). Comments were provided on 90% submittal (11/11/22). Muller completed the 100% design submittal on 11/22/22. CDOT permit was issued, and pre-construction meeting was held on 1/10/23; construction start is scheduled for 1/30/23 pending execution of easement documents from Surrey Ridge which has agreed to terms and easement language. Notice to Proceed on construction is pending execution of easement documents (1/27/23). Easements have been signed by property owners and Notice to Proceed has been issued to Naranjo Civil Constructors (2/8/23). Construction is underway with initial construction BMPs/stormwater controls in place; water diversion and control is being set up for the downstream section of the project (3/10/23). Water control is in place and construction of stream reclamation is underway for downstream sections of the project (3/30/23). Riffle and Boulder Cascade drop structures on downstream third of project are nearing completion (4/13/23). Construction is underway in the middle third of the project; efforts consist of stream grading and installation of Riffle and Boulder Cascade drop structures (5/12/23). The storm damage from May 11 to 13, 2023 event is being identified and repaired (5/25/23). Construction on the middle third is substantially complete and work has begun on the upstream third (7/27/23). *The construction is nearly complete with the punch list walk on 9/13/23; contractor is working on completing plantings and resolving punch list items.*

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

- a. Description: The design and construction are in partnership with Southeast Metro Stormwater Authority (SEMSWA) and with Mile High Flood District (MHFD) being a key stakeholder; it includes 1,300 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$175,000. The total project cost is estimated at \$700,000.
- b. Status: SEMSWA is drafting the Intergovernmental Agreement to bring in the 2021 funding for the project (3/12/21). RESPEC is the design consultant; two conceptual design alternatives have been prepared and reviewed during meeting on 3/15/21. IGA is scheduled for CCBWQA's May TAC and Board meetings (4/30/21). IGA has been approved and executed by all parties (7/29/21). 30% Design Review Meeting was held on 8/23/21. A Progress meeting is scheduled for 2/26/22 with 60% Plan submittal expected to follow (1/28/22). The 60% Design was submitted on 2/16/2022, comments were provided, and a design review meeting was held on 2/23/2022. IGA Amendment to bring in 2022 funding is in process (3/10/22). Construction costs were prepared by CEI based on 60% submittal (5/13/22). A design progress meeting was held 6/14/22 and 90% design submittal is being prepared (6/30/22). 90% design submittal is expected by the end of July (7/15/22). The 90% design submittal was reviewed, and comments were submitted on 8/22/22. *Construction is anticipated in 2023 (10/13/22).* A progress meeting was held on 11/8/22, project will likely be done in 2 phases, IGA Amendment will be needed early in 2023 so that construction can start ahead of storm season. Dove Creek IGA for construction of Phase 1 is scheduled for TAC and Board in January 2023, construction is expected to start shortly afterwards (12/30/22). Construction is scheduled to start mid-February; construction agreement and engineering construction services amendment are currently being reviewed (1/27/23). Construction and engineering construction services have been finalized and a preconstruction meeting was held on 2/2/23. Notice to Proceed has been issued to Concrete Express; construction is underway with initial construction BMPs/stormwater controls in place (3/10/23). Water control is in place and construction of stream reclamation is on-going (3/30/23). Step pool drop structures have been constructed and work on soil wraps is underway (4/13/23). Low-flow or bank full channel work (soil wraps and erosion control blanket) and step-pool structures are

complete, water diversion has been removed, and is active to storm flows; work continues in upland areas and higher elevations of stream reclamation (5/12/23). Storm damage from May 11 to 13, 2023 event is being repaired (5/25/23). Construction punch list is being completed (6/29/23). Construction is complete (7/27/23).

9. Piney Creek from Fraser Street to Confluence with Cherry Creek aka Reaches 1 and 2 (CCB-21.1)
 - a. Description: This project includes 2900 liner feet of stream reclamation on Piney Creek. The project partners are SEMSWA and CCBWQA.
 - b. Status: Project coordination meeting was held with SEMSWA on 6/29/22. IGA drafted and is being reviewed by SEMSWA (8/12/22). IGA was approved by CCBWQA at the 9/15/22 Board meeting. IGA Amendment to bring in 2023 funding was recommended by the TAC and authorized by the Board in May (5/25/23). CCBWQA sent the Draft IGA Amendment to SEMSWA for review on 6/29/23. SEMSWA has no comments on the IGA Amendment and plans to take it to their Board in October (8/11/23). *The project site was walked with SEMSWA and Olsson and Associates on 8/30/23, Olsson is preparing their scope of work and fee for design.*
10. Mountain and Lake Loop Shoreline Stabilization Phase II (OM 4.6)
 - a. Description: This project was identified in through the 2020 annual inspection and design and permitting started in 2021. It adds about 40 feet of shoreline protection where it has eroded leaving a 1-2 foot tall vertical bank.
 - b. Status: Construction Plans have been prepared and the GESC was submitted to Arapahoe County for review (1/13/22). Plans are being reviewed by US Army Corps of Engineers for 408 clearance (5/13/22). *Comments were received from the US Army Corps of Engineers on 8/29/23.*
11. Cherry Creek from Reservoir to Lake View Drive (OM 4.6)
 - a. Description: This project is in follow up to CCBWQA's study of Cherry and Piney Creeks in Cherry Creek State Park (CCSP). Muller completed two reports on Cherry Creek from Reservoir to State Park Boundary, Stream and Water Quality Assessment and Baseline Channel Monitoring Report, in 2022. These reports highlight the need for this project.
 - b. Status: A workshop is scheduled for the 3/16/23, to seek CCBWQA Board and TAC input on this project and Cherry and Piney Creeks in CCSP (3/10/23). *The follow up from workshop is underway – project overview and funding flyer has been created, Muller is scoping the next step of design for Reach 1 and providing a fee, and multi-pronged approach is in development for workshop priority reaches that prioritizes Reach 1 and reduces risk from upstream reaches; these items will be brought to TAC and Board for discussion, direction, and/or action at upcoming meetings (3/30/23). A site visit for partner outreach and funding was held on 5/25/23 at 1-4 pm (6/8/23). A coordination meeting was held with Aurora on 6/23/23 and they showed interest in partnering on the project to protect their water lines. The Mile High Flood District has provided their budget/CIP schedule and Arapahoe County Open Space has been contacted to investigate potential partnering opportunities (7/13/23). The TAC created a subcommittee for this project on 8/3/23; which will attend progress meetings, provide timely feedback to Muller, and to coordinate with TAC as-needed. *The alternatives analysis kickoff meeting was held on 8/29/23.**