



Notice of Regular Meeting
Cherry Creek Basin Water Quality Authority
Board of Directors Meeting
Thursday, April 20, 2023 at 9:00 a.m.

The meeting will be conducted in-person and virtually as set forth below.

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

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

CCBWQA Board of Directors Meeting Documents can be found online at the link below.

https://drive.google.com/drive/folders/1KqGcDC9eS_gMEdSiXPPPBGefAHTib7pf?usp=share_link

1. Call to Order and Pledge of Allegiance
2. Consent Agenda (5 minutes)
(Items on the consent agenda can be approved with a single motion or, items can be requested to be moved from the consent agenda and moved to the "discussion or direction and/or action" section.)
 - a. Approval of the March 16, 2023 Minutes (enclosed)
 - b. Acceptance of the Schedule of Cash Position dated April, 2023 (enclosed)
 - c. Acceptance of the Paid Claims for March, 2023 (enclosed)
 - d. Approval of Unpaid Claims as of April, 2023 (enclosed)
3. Direction and/or Action (30 minutes)
 - a. Authorization of Happy Canyon Creek at Jordan Rd. IGA Amendment - MHFD IGA Amendment 21-05.24B (Borchardt, enclosed)
 - b. Acceptance of 2022 Wetland Harvesting Update, Authorization of the Pilot Project for 2023, and Continued Work with L&M Enterprises (Borchardt and Stewart, enclosed)
 - c. Approval of Muller Engineering Scope of Work for Alternatives Analysis and Preparation of the Corresponding Agreement (Borchardt, enclosed)
4. Discussion (30 minutes)
 - a. Cherry and Piney Creeks Workshop Follow-Up (Borchardt)
 - i. Project Overview and Outreach Handout (enclosed)
 - ii. Discuss Workshop Notes, Follow-Up, and Multi-Pronged Approach (enclosed)
 - b. Lake Nutrients Criteria RMH Outcome and Next Steps (DiToro/Clary, enclosed)
 - c. Reservoir Destratification System (RDS) Start-up Update (Goncalves)
 - d. Peoria Pond Maintenance Agreement Update (Borchardt/Clary)
 - e. Control Regulation 72 Information Hearing Outcome Memo (DiToro/Clary, enclosed)
5. Presentations (15 minutes)
 - a. Parker Water and Sanitation Control/Castle Rock CR 72 Proposal (Rebecca Tejada)
 - b. Water Quality Standards 101 (DiToro)
6. Board Member Items
 - a. [Board Binder](#)
7. Updates (10 minutes)
 - a. Technical Manager (Clary)
 - i. TAC Subcommittees
 - b. Cherry Creek Stewardship Partners Update and [Events](#) (Davenhill)
 - i. Cherry Creek Watershed Conference - August 24, 2023 at the Parker Arts, Culture, and Events Center
 - c. TAC (Erickson)
 - d. Contract Staff (see enclosed memos)

- i. PAPM
 - a. CIP Status Report (Borchardt)
 - b. Maintenance and Operations Status Report (Goncalves)
 - ii. [Water Quality Update](#) (Stewart)
 - iii. Regulatory (DiToro)
 - iv. Land Use Referrals - [2023 Tracking](#) (Endyk)
 - e. Legal
 - f. Other - Reminder of Watershed Plan Process Workshop - September 21, 2023 8:30-11:30 am
8. Executive Session pursuant to Section 24-6-402(4) C.R.S., if necessary.
9. Adjournment



**Cherry Creek Basin Water Quality Authority
Minutes of the Board of Directors
Thursday, March 16, 2023 at 8:30 a.m.**

Board Members Present

Bahman Hatami, Governor's Appointee
Bill Ruzzo, Assistant Secretary, Governor's Appointee
Christopher Lewis, Vice Chair, Governor's Appointee
Geoff Blue, City of Castle Pines - Alternate
Jessica LaPierre, City of Aurora - Alternate
John McCarty, Secretary/Treasurer, Governor's Appointee
John Woodling, Governor's Appointee
Joshua Rivero, Chair, Town of Parker
Leslie Summey - Arapahoe County
Margaret Medellin, Governor's Appointee
Max Brooks, Town of Castle Rock
Rebecca Tejada - Special Districts, Parker Water and Sanitation District - Alternate
Stephanie Piko, City of Centennial
Tom Downing, Governor's Appointee
Tom Stahl, City of Greenwood Village (zoom)

TAC Members Present

Alex Mestdagh, Town of Parker
Ashley Byerley, SEMSWA
Brad Robenstein, Douglas County - Alternate (zoom)
Caitlin Gappa, Douglas County Health Department
Casey Davenhill, Board Appointee, Cherry Creek Stewardship Partners
David Van Dellen, Town of Castle Rock
Jacob James, City of Lone Tree
James Linden, SEMSWA - Alternate (zoom)
Jason Trujillo, Board Appointee, Cherry Creek State Park (zoom)
Jon Erickson, TAC Chair, Board Appointee, Colorado Parks and Wildlife
Lisa Knerr, TAC Vice Chair, Arapahoe County
Marty Easter, Arapahoe County Public Health - Alternate
Rick Goncalves, Board Appointee
Wanda DeVargas, Board Appointee, E-470 (zoom)

Others Present

Alan Leak, RESPEC
Erin Stewart, LRE Water
Jane Clary, Wright Water Engineers, CCBWQA Technical Manager
Jessica DiToro, LRE Water
Jim Wulliman, Muller Engineering
John Yager, Muller Engineering
Michael Grabczyk, Town of Parker

Richard Borchardt, R2R Engineers
Tim Flynn, Collins Cole Flynn Winn & Ulmer, PLLC
Val Endyk, CCBWQA

1. Call to Order and Pledge of Allegiance

Director Rivero called the meeting to order at 8:32 am and led in the pledge of allegiance.
Director Rivero moved Agenda item 4b from Discussion to Direction and/or Action.

2. Consent Agenda

- a. **Approval of the February 16, 2023 Minutes**
- b. **Acceptance of the Schedule of Cash Position dated March, 2023**
- c. **Acceptance of the Paid Claims for February, 2023**
- d. **Approval of Unpaid Claims as of March, 2023**
- e. **Approval of 2023 Agreements**
 - i. **Amendment to RG and Associates 2023 Agreement**

Director Brooks moved to approve the consent agenda. Seconded by Director Ruzzo. The motion carried.

3. Direction and/or Action

a. Approval of Cherry Creek at Dransfeldt IGA

Rich Borchardt presented the Cherry Creek at Dransfeldt project on Cherry Creek near Dransfeldt Road, just downstream of the Cherry Creek at KOA project which was completed in the summer of 2021. The project sponsors are CCBWQA, Parker, and the Mile High Flood District (MHFD), which is the project lead. Current market conditions and inflationary pressures have increased project costs about 27.5% from August 2020 to February 2023. CCBWQA's budget for this year's contribution to the project is \$170,000. Due to project cost increases, MHFD and Parker have increased their 2023 funding to the project, and Parker has [requested](#) CCBWQA increase its 2023 participation by \$400,000. Further background on the project including photos and a summary of project expenditures can be found in the [Action Item Memo](#). The proposed IGA [Amendment](#) was provided to the Board for review.

Director McCarty moved that the Board authorize CCBWQA to execute the IGA Amendment and an expenditure of \$570,000 together with a MHFD Special Funds Transfer of about \$37,070 in CCBWQA unused funds from the completed projects of Cherry Creek at Norton Farms and Cherry Creek at Hess Road. Seconded by Director Summey. Director Rivero abstained. The motion carried.

b. Acceptance of the [WY 2022 Water Quality Monitoring Report](#)

The CCBWQA water quality monitoring consultant, LRE Water, generates a water quality monitoring report annually which provides a summary of the water quality monitoring results from each water year based on the purpose and objectives set forth in the [CCBWQA Routine Sampling and Analysis Plan/ Quality Assurance Project Plan \(SAP/ QAPP\)](#). The monitoring report addresses the monitoring and reporting requirements in Reg. 72.

Director Summey moved to accept the WY2022 CCBWQA Water Quality Monitoring Report. Seconded by Director Blue. The motion carried.

c. Acceptance of the [2022 CCBWQA Annual Report on Activities](#)

LRE Water has worked with the CCBWQA members, staff, and other stakeholders to create the 2022 Annual Report on Activities which is located on the CCBWQA's [data portal](#). In addition, an [executive summary](#) of the activities was provided to highlight key factors from the monitoring program, watershed projects, and CCBWQA partner activities in 2022. This report is compiled as a benefit to the CCBWQA and to comply with the reporting requirements set forth in Reg. 72.

Director Medellin moved to accept the 2022 CCBWQA Annual Report on Activities and to submit a letter with a link to the annual report and the executive summary to the WQCC by March 31, 2023. Seconded by Director Downing. The motion carried.

d. Reg. 38 Rulemaking Hearing- CDPHE Direction Change

Jessica DiToro and Jane Clary provided a [memo](#) outlining the following:

CCBWQA remains a party to the Lakes Nutrients Rulemaking hearing. CCBWQA requested a delayed effective date of December 31, 2025 to allow time to develop site specific standards. Although the Water Quality Control Division (Division) originally opposed this request, at the March 7, 2023 Prehearing Conference the Division proposed a major change in direction for standards adoption that would result in a statewide delayed effective date of December 31, 2027. This change in direction effectively addresses CCBWQA's request. CCBWQA staff have followed up with the Division staff to request that CCBWQA's Statement of Basis of Purpose language regarding development of site specific standards continue to be included in Regulation 38 with revised dates aligning with the Division's revised proposal. The CCBWQA's Regulation 38 Special Board Committee has been informed of and supported this communication with the Division. CCBWQA staff would like to submit a surrebuttal outlining the above request regarding Statement of Basis and Purpose language.

Discussion included:

- Concerns as to whether CCBWQA will be able to obtain site-specific standards prior to implementation of the new standards.
- The delayed effective date is intended to allow dischargers the necessary time to evaluate costs and feasibility of treatment associated with these standards.
- The additional time may allow CCBWQA to focus on updates to the models first (if desired), before developing site-specific standards, with plenty of time remaining for the development of site-specific standards by the 2027 RMH.

Director Blue moved that the Board direct DGS to submit a surrebuttal for the Lakes Nutrient Criteria Rulemaking Hearing to document minor changes to CCBWQA's previously submitted Statement of Basis of Purpose exhibit. The purpose of these changes is to bring CCBWQA's proposed delayed effective date and site-specific standards development timeline into alignment with the Water Quality Control Division's proposed delayed effective date timeline. Seconded by Director Ruzzo. The motion carried.

4. Discussion

a. Modeling and Watershed Committee Direction

Jane Clary provided a [memo](#) detailing the formation of a TAC Modeling Subcommittee and a Watershed Plan Subcommittee and requested participation of two or more Board members on each Subcommittee along with all interested TAC members.

Several Board members expressed interest in participating in the Subcommittees.

b. Reg. 38 Rulemaking Hearing- CDPHE Direction Change (Clary/DiToro) *moved to 3d Action Items*

5. Presentations

None

6. Board Member Items

None

7. Updates

Updates provided in the packet due to shortened meeting time prior to the March workshop.

a. Technical Manager (Clary)

b. Cherry Creek Stewardship Partners Update and [Events](#) (Davenhill)

- c. TAC (Erickson)
- d. Contract Staff (see enclosed memos)
 - i. PAPM
 - a. [CIP Status Report](#) (Borchardt)
 - b. Maintenance and Operations Status Report (Goncalves)
 - ii. [Water Quality](#) and [Memo](#) (Stewart)
 - iii. Regulatory (DiToro)
 - iv. Land Use Referrals - [2023 Tracking](#) (Endyk)
- e. Legal
- f. Other
 - i. Reminder of Watershed Plan Process Workshop - September 21, 2023 8:30-11:30 am

8. Executive Session pursuant to Section 24-6-402(4) C.R.S., if necessary.
None

9. **Adjournment**

There being no further business to come before the Board, Director Rivero moved to adjourn the meeting at 9:06 am.

Cherry Creek Basin Water Quality Authority
Schedule of Cash Position
 March 31, 2023
 as of April 11, 2023

	<u>General Fund</u>	<u>Pollution Abatement Fund</u>	<u>Enterprise Fund</u>	<u>Total</u>
<u>1st Bank - Checking Account</u>				
Balance as of 03/31/23	\$ 29,838.37	\$ 20,699.98	\$ 9,490.00	\$ 60,028.35
Subsequent activities:				
04/05/23 Alpine Trophoes	(14.59)	-	-	(14.59)
04/05/23 Get Stream Online	(200.00)	-	-	(200.00)
<i>Anticipated Activities</i>				
<i>Monthly Transfer for AP</i>	40,000.00	25,000.00	25,000.00	90,000.00
<i>Bill.com Open Invoices</i>	(49,294.01)	(31,662.65)	(28,397.86)	(109,354.52)
<i>Anticipated balance</i>	<u>\$ 20,329.77</u>	<u>\$ 14,037.33</u>	<u>\$ 6,092.14</u>	<u>\$ 40,459.24</u>
<u>ColoTrust General - (8001)</u>				
Balance as of 03/31/23	\$ 1,025,867.38	\$ 2,745,976.58	\$ 1,549,499.41	\$ 5,321,343.37
Subsequent activities:				
04/10/23 Ptax Arapahoe (Mar)	92,970.16	-	-	92,970.16
04/10/23 Ptax Douglas (Mar)	71,594.71	-	-	71,594.71
Deposits Dev Checks to Date	-	-	2,776.36	2,776.36
<i>Anticipated Activities</i>				
<i>Monthly Transfer for AP</i>	(40,000.00)	(25,000.00)	(25,000.00)	(90,000.00)
<i>Anticipated balance</i>	<u>\$ 1,150,432.25</u>	<u>\$ 2,720,976.58</u>	<u>\$ 1,527,275.77</u>	<u>\$ 5,398,684.60</u>
<u>ColoTrust Pollution Abatement - (8002)</u>				
Balance as of 03/31/23	\$ -	\$ 55,036.19	\$ -	\$ 55,036.19
<i>Anticipated balance</i>	<u>\$ -</u>	<u>\$ 55,036.19</u>	<u>\$ -</u>	<u>\$ 55,036.19</u>
<u>CSAFE - Savings Account</u>				
Balance as of 03/31/23	\$ 859,161.30	\$ 42,246.04	\$ 370,439.36	\$ 1,271,846.70
<i>Anticipated balance</i>	<u>\$ 859,161.30</u>	<u>\$ 42,246.04</u>	<u>\$ 370,439.36</u>	<u>\$ 1,271,846.70</u>
<i>Total funds available as of date above</i>	<u><u>\$ 2,029,923.32</u></u>	<u><u>\$ 2,832,296.14</u></u>	<u><u>\$ 1,903,807.27</u></u>	<u><u>\$ 6,766,026.73</u></u>

Effective monthly yield (as of 3/31/2023)

1st Bank - 0.100%* if Balance >\$20,000
 ColoTrust Plus - 4.8592%
 CSAFE - 4.77%

Cherry Creek Basin Water Quality Authority
Paid Claims March 11, 2023 through April 14, 2023

Process Date	Vendor	Invoice Number	Payment Reference	Amount
3/21/2023	CliftonLarsonAllen LLP	3595208	P23031901 - 0250420	4,953.52
3/21/2023	Collins Cole Flynn Winn & Ulmer, PLLC	3120	P23031901 - 0250426	8,933.50
3/21/2023	Davis Graham & Stubbs LLP	845452	P23031901 - 0250404	641
3/21/2023	LRE Water	22281	P23031901 - 0250412	42,892.87
3/21/2023	Muller Engineering Company	Multiple	P23031901 - 0250372	4,216.00
3/21/2023	Pinpoint Systems Inc.	9817	P23031901 - 0250430	1,282.50
3/21/2023	R2R Engineers, Inc.	2023-02	P23031901 - 0250434	19,233.05
3/21/2023	RESPEC	Multiple	P23031901 - 0250382	6,175.79
3/21/2023	RG and Associates LLC	Multiple	P23031901 - 0250390	5,897.50
3/21/2023	Valerie Endyk	14	P23031901 - 0250416	6,318.75
3/21/2023	Wright Water Engineers, Inc.	Multiple	P23031901 - 0250396	12,766.75
			Subtotal	\$ 113,311.23
Other Payments				
3/14/2023	Yolanda's Tacos	-	Visa	329.02
3/15/2023	King Sooper	-	Visa	41.86
3/27/2023	Verizon	-	ACH Payment	51.49
4/4/2023	Get Streamline.com Website	-	Visa	200.00
4/4/2023	Alpine Trophies	-	Visa	14.59
			Subtotal	\$ 636.96
			Total Payments	\$ 113,948.19

**Cherry Creek Basin Water Quality Authority
Unpaid Claims as of 4/14/23**

Date	Vendor*	Invoice #	Account Description	Amount
3/31/2023	CliftonLarsonAllen LLP	3647310	107000 Accounting	3,362.34
3/31/2023	Collins Cole Flynn Winn & Ulmer, PLLC	3391	107460 Legal services	7,426.00
2/28/2023	Davis Graham & Stubbs LLP	846995	107050 Regulatory Support	2,220.50
3/25/2023	LRE Water	22588	107050 Regulatory Support	3,270.50
3/25/2023	LRE Water	22588	107450 General watershed management	4,771.75
3/25/2023	LRE Water	22588	107451 Annual report	2,160.25
3/25/2023	LRE Water	22588	107453 Data management	163.00
3/25/2023	LRE Water	22588	107500 General technical support	4,031.25
3/25/2023	LRE Water	22588	107501 Monitoring - Reservoir	215.00
3/25/2023	LRE Water	22588	107502 Monitoring - Watershed	2,349.50
3/25/2023	LRE Water	22588	107505 Data management	1,652.50
3/25/2023	LRE Water	22588	107506 Monitoring - Laboratory	4,042.42
3/25/2023	LRE Water	22588	117712 PRF reservoir destratification	107.50
3/20/2023	Muller Engineering Company	36232	407720 Reservoir to 12-Mile Park Study	300.25
3/20/2023	Muller Engineering Company	36233	407720 Reservoir to 12-Mile Park Study	25,229.61
3/31/2023	Pinpoint Systems Inc.	9837	107481 Office expense	453.75
2/28/2023	RESPEC	INV-0223-986	117728 Reservoir Shoreline Stabilization - East Shade Shelter	2,893.00
3/31/2023	R2R Engineers, Inc.	2023-03	107440 - Management/Administration	5,996.25
3/31/2023	R2R Engineers, Inc.	2023-03	117440 - Management/Administration	16,938.90
3/31/2023	RG and Associates LLC	153045	107445 TAC coordination	1,237.50
3/31/2023	RG and Associates LLC	153045	117702 O&M - Reservoir Destratification	866.25
3/25/2023	Valerie Endyk	15	107010 Administrative Assistant	3,862.50
3/31/2023	Wright Water Engineers, Inc.	66305	107050 Regulatory Support	2,021.25
3/31/2023	Wright Water Engineers, Inc.	66305	107450 General watershed management	57.75
3/31/2023	Wright Water Engineers, Inc.	66305	117440 Management/administration	10,857.00
3/31/2023	Wright Water Engineers, Inc.	66304	407736 Special Studies/Projects: BMP Effectiveness	2,868.00
3/9/2023	*Xcel Energy	819225043	117701 Utilities - Reservoir Destratification	-
4/5/2023	*Xcel Energy	822847848	117701 Utilities - Reservoir Destratification	-

Total Claims \$ 109,354.52

General Fund	\$ 49,294.01
Pollution Abatement Fund	31,662.65
Enterprise Fund	28,397.86
Total Claims by Funding Source	<u><u>\$ 109,354.52</u></u>

* by vendor

** Xcel Energy account was paid double in October 2022. There was a credit memo for \$5,239.92 from which \$533.63 was applied to invoice 819225043 and \$505.30 to invoice 822847848. A credit of \$4,200.99 remains on the account as of 4.11.2023.

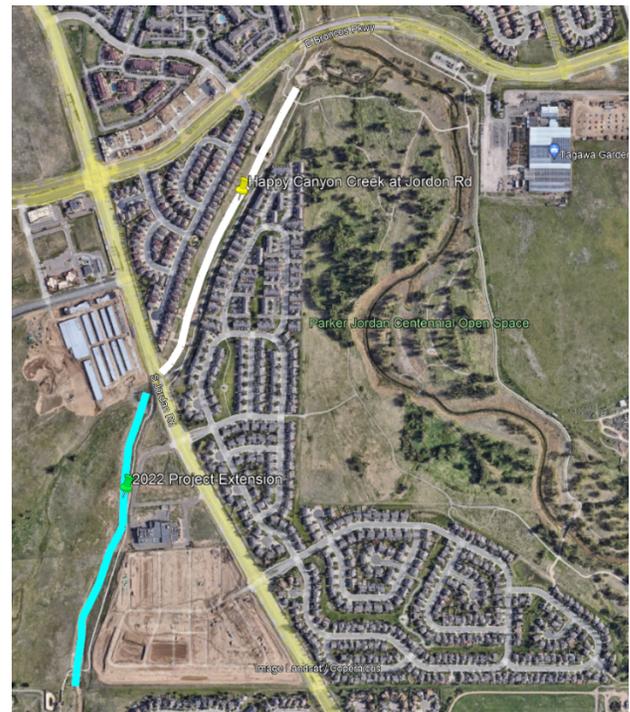


ACTION ITEM MEMORANDUM

To: CCBWQA Board of Directors
From: Richard Borchardt, Pollution Abatement Project Manager
Date: April 20, 2023
Subject: Authorization of Happy Canyon Creek at Jordan Rd. IGA Amendment - MHFD IGA Amendment 21-05.24B

Request: The Board authorize CCBWQA to execute the Amendment to the Intergovernmental Agreement #21-05.24B (IGA Amendment) for stream improvements on Happy Canyon Creek at Jordan Road (Project) for an amount not to exceed \$88,000.

Project: The Project is on Happy Canyon Creek near Jordan Road. Happy Canyon Creek is a tributary to Cherry Creek. The Project sponsors are CCBWQA, the Southeast Metro Stormwater Authority (SEMSWA), and the Mile High Flood District (MHFD) which is the project lead. Jacobs is the design consultant. The proposed stream improvements benefit the water quality in Happy Canyon Creek and Cherry Creek Reservoir by reducing bed and bank erosion and immobilizing Phosphorus in the adjacent soils. It is estimated that this 0.85 mile long-project will immobilize 77 pounds of phosphorus annually. This IGA Amendment includes additional funding of \$580,000 (\$290,000 MHFD; \$202,000 SEMSWA; and \$88,000 CCBWQA). The IGA Amendment is attached. The total project is currently estimated at \$1,323,000 in this IGA Amendment, additional amendments will be needed to bring future funding from the sponsors' capital improvement programs which currently include funding through 2026, when construction is anticipated.



TAC Review: TAC recommended that the Board authorize the IGA Amendment, pending satisfactory resolution of CCBWQA's comments, and an expenditure of \$88,000. All CCBWQA's comments have been satisfactorily resolved in the attached IGA Amendment.

Budget: CCBWQA's 2023 Budget includes \$88,000 for the Project.

Motion: I move that the Board authorize CCBWQA to execute the IGA Amendment for stream improvements on Happy Canyon Creek at Jordan Road for an amount not to exceed \$88,000.



Photo of Happy Canyon Creek downstream of Jordan Road (Courtesy of Molly Trujillo)



Photo of Happy Canyon Creek downstream of Jordan Road (Courtesy of Molly Trujillo)



Photo of Happy Canyon Creek upstream of Jordan Road



Photo of Happy Canyon Creek upstream of Jordan Road

SECOND AMENDMENT TO
AGREEMENT REGARDING
DESIGN AND CONSTRUCTION
OF DRAINAGE AND FLOOD CONTROL IMPROVEMENTS FOR
HAPPY CANYON CREEK FROM JORDAN ROAD TO BRONCOS PARKWAY

Agreement No. 21-05.24B
Project No. 108514

THIS SECOND AMENDMENT TO AGREEMENT (hereinafter called "SECOND AMENDMENT"), is entered into by and among URBAN DRAINAGE AND FLOOD CONTROL DISTRICT D/B/A MILE HIGH FLOOD DISTRICT (hereinafter called "DISTRICT") and SOUTHEAST METRO STORMWATER AUTHORITY (hereinafter called "SEMSWA") and CHERRY CREEK BASIN WATER QUALITY AUTHORITY (hereinafter called "CCBWQA"), known singularly herein as "PARTY" and collectively as "PARTIES";

WITNESSETH:

WHEREAS, PARTIES have entered into "Agreement Regarding Design and Construction of Drainage and Flood Control Improvements for Happy Canyon Creek from Jordan Road to Broncos Parkway" (Agreement No. 21-05.24) dated June 30, 2021, as amended by First Amendment (Amendment No. 21-05.24A), dated May 22, 2022, (collectively called "AGREEMENT"); and

WHEREAS, PARTIES now desire to proceed with design and construction of drainage and flood control improvements for Happy Canyon Creek from Jordan Road to Broncos Parkway (hereinafter called "PROJECT"); and

WHEREAS, PARTIES desire to increase the level of funding by \$580,000; and

WHEREAS, DISTRICT's Board of Directors has authorized additional DISTRICT financial participation for PROJECT (Resolution No. 54, Series of 2023); and

WHEREAS, the Board of Directors of each of the PARTIES have authorized, by appropriation or resolution, each PARTY's share of PROJECT costs.

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

1. Paragraph 4. PROJECT COSTS AND ALLOCATION OF COSTS is deleted and replaced as follows:

4. PROJECT COSTS AND ALLOCATION OF COSTS

A. PARTIES agree that for the purposes of this AGREEMENT, PROJECT costs shall consist of and be limited to the following:

1. Final design services;
2. Construction of improvements;
3. Contingencies mutually agreeable to PARTIES.

B. It is understood that PROJECT costs as defined above are not to exceed \$1,323,000 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	\$	700,000	\$ 500,000
2. Construction *	\$	623,000	\$ 243,000
3. Contingency	\$	-0-	\$ -0-
Grand Total	\$	1,323,000	\$ 743,000

* It is anticipated that 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, if applicable.

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

	<u>Percentage Share</u>	<u>Previously Contributed</u>	<u>Additional Contribution</u>	<u>Maximum Contribution</u>
DISTRICT	48%	\$350,000	\$290,000	\$640,000
SEMSWA	38%	\$300,000	\$202,000	\$502,000
CCBWQA	14%	\$93,000	\$88,000	\$181,000
TOTAL	100.00%	\$743,000	\$580,000	\$1,323,000

D. DISTRICT and SEMSWA acknowledge that (i) CCBWQA does not by this Agreement irrevocably pledge present cash reserves for payments in future fiscal years, and (ii) It is understood and agreed that notwithstanding any other provision contained herein to the contrary, any additional contribution obligation of CCBWQA hereunder, whether direct or contingent, shall extend only to funds duly and lawfully appropriated and encumbered by the Board of Directors of CCBWQA for the purposes of the Agreement, and paid into the Treasury of CCBWQA, and shall under no circumstances exceed \$181,000 without CCBWQA's prior express written consent.

2. Paragraph 5. MANAGEMENT OF FINANCES is deleted 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 DISTRICT approval.

Payment of each PARTY's full share (SEMSWA - \$502,000; CCBWQA - \$181,000; DISTRICT - \$640,000), to the extent not previously paid, shall be made to DISTRICT subsequent to execution of this

AGREEMENT and within 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 SEMSWA and CCBWQA 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).

Within one 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 SEMSWA or CCBWQA request, SEMSWA or CCBWQA 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, PARTIES hereto have caused this SECOND 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

SOUTHEAST METRO STORMWATER
AUTHORITY

By _____

Name _____

Title _____

Date _____

CHERRY CREEK BASIN
WATER QUALITY AUTHORITY

CCBWQA Checked by

By _____

Name _____

Title CCBWQA Chair _____

Date _____

Attest: John McCarty, CCBWQA Secretary

APPROVED AS TO FORM:

Timothy J. Flynn, General Counsel for
CCBWQA



ACTION ITEM MEMORANDUM

To: CCBWQA Board of Directors
From: Richard Borchardt, Pollution Abatement Project Manager and Erin Stewart, LRE Water
Date: April 20, 2023
Subject: Acceptance of 2022 Wetland Harvesting Update, Authorization of the Pilot Project for 2023, and Continued Work with L&M Enterprises

Request: The Board accept the [2022 Wetland/Cattail Harvesting Pilot Project Update](#) (2022 Update) and authorize the Wetland/Cattail Harvesting Pilot Project to continue in 2023 and approve implementation of the recommendations from the 2022 Update, an expenditure of not to exceed \$90,000, the direct selection of L&M Enterprises to perform the harvesting, and authorize a member of the executive committee to execute an appropriate agreement.

Project / Issue:

CCBWQA has identified phosphorus and nitrogen as two key nutrients that affect the water quality in Cherry Creek Reservoir. In March 2021, CCBWQA authorized a pilot project for Wetland/Cattail Harvesting based on the Cattail Harvesting Pilot Project Memo (CHPPM).

In 2021 and 2022, CCBWQA harvested 6.25 acres of wetlands/cattails removing an estimated 2050 pounds of nitrogen and 270 pounds of phosphorus from the Cottonwood Creek system at a cost of \$172,500. The pilot project to date has an average water quality benefit unit cost of \$640 per pound of phosphorus removed (PPR) which is lower than the estimated water quality benefit unit cost of \$1,000 PPR in the CHPPM. For additional information and details see the attached 2022 Update.

In 2022, CCBWQA changed the harvesting approach based on input from the TAC and Board which incorporated the lessons learned during the 2021 harvest. These changes included some minor adjustments like

starting coordination earlier to get the contractor's input and starting the harvest a week earlier to minimize the nutrients in the cattails from moving out of above-ground biomass into their roots. The TAC and Board provided additional directions to work with the contractor to optimize the harvest area and biomass removed (see **Figure 1**), to have the harvest areas independently measured by LRE Water, and to contract with L&M Enterprises to do the harvest.

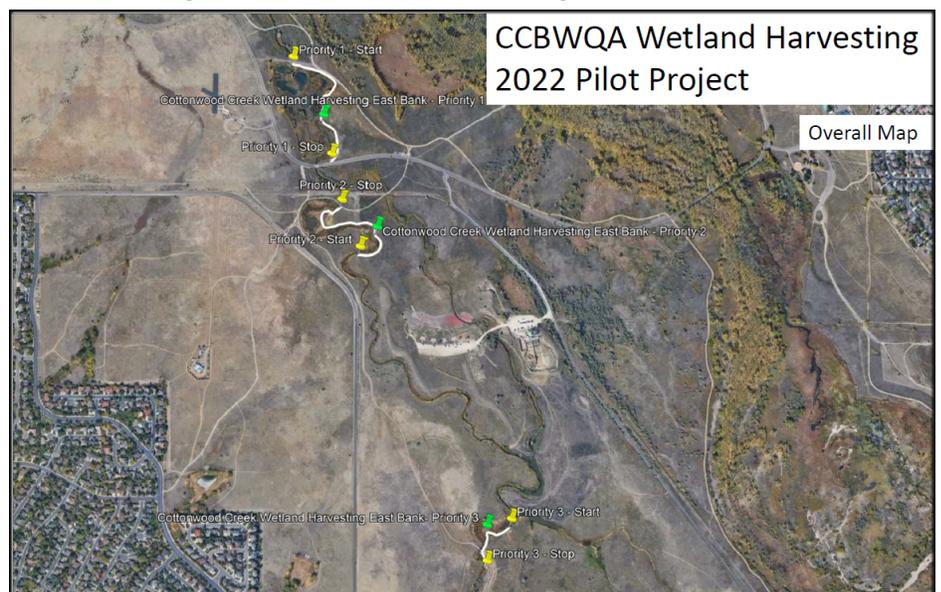


Figure 1 – Approach to Optimize of Harvest

1), to have the harvest areas independently measured by LRE Water, and to contract with L&M Enterprises to do the harvest.

The 2022 Update includes lessons learned from the 2022 harvesting and recommendations for the 2023 harvest (see **Table 1**).

Table 1. Lessons Learned and Recommendations

Lessons learned from 2022	Recommendations for 2023
Phragmites are present in the Cottonwood Creek wetlands.	Continue monitoring of noxious weeds and coordination with Colorado Parks and Wildlife.
Aquatic vegetation (coontail) clogged the outlet structure grate.	Cleaning of the outlet structure grate and opening of the outlet gate at Peoria Pond may be required if elevated water levels impact harvesting operations.
The revised harvesting approach had better results based on removing a higher amount of biomass and increasing the mass of nutrients removed.	Continue this approach going forward.
LRE Water’s independent measurement of the harvest areas included a mapping layer which allows for comparison of the remaining harvests in the pilot project.	Continue to have LRE Water independently measure the harvest areas and provide a mapping layer.
When the right bank (looking downstream) is harvested, the impacts on the native grasses and compaction of topsoil were notable, see Appendix H . Decompaction and reseeding of this Peoria Pond dam embankment area are included in the 2023 CCBWQA maintenance budget.	Evaluate ways to mitigate impacts of harvesting on native vegetation and topsoil compaction. Consider having the contractor use a clockwise traffic pattern that uses Lake View Drive, then over the dam embankment, and then over concrete path to minimize the impacts of loaded trucks and trailers on the native grasses and topsoil on the dam embankment. If there are continued impacts to native grasses and topsoil, then it may be worth looking at an improved surface for the access route.
There is limited access off the main trail system for the right bank (looking downstream). Increased traffic conflicts led to vehicles departing from mowed routes.	Consider additional mowed access points and coordinate/evaluate them with Colorado Parks and Wildlife.

Multiple factors may affect the fraction of the nutrient load that would have reached the Reservoir in the absence of wetland harvesting. CCBWQA will continue to review water quality over the course of the pilot project to evaluate if estimates of the nutrient load reduction achieved because of the harvesting project can be calculated.

L&M has successfully completed the harvesting for 2 years and was critical to the optimization effort in 2022, so it is recommended that CCBWQA continue their partnership for 2023. For 2023, LRE Water will be managing the wetlands harvesting.

TAC Review: TAC recommended that the Board accept the 2022 Update and authorize Wetland/Cattail Harvesting Pilot Project continue in 2023, an expenditure of not to exceed \$90,000, the direct selection of L&M Enterprises to perform the harvesting, and that the recommendations for the 2023 harvest be implemented.

Motion: I move that the Board accept the 2022 Update and authorize the Wetland/Cattail Harvesting Pilot Project to continue in 2023 and approve implementation of the recommendations from the 2022 Update, an expenditure of not to exceed \$90,000, the direct selection of L&M Enterprises to perform the harvesting, and authorize a member of the executive committee to execute an appropriate agreement.



ACTION ITEM MEMORANDUM

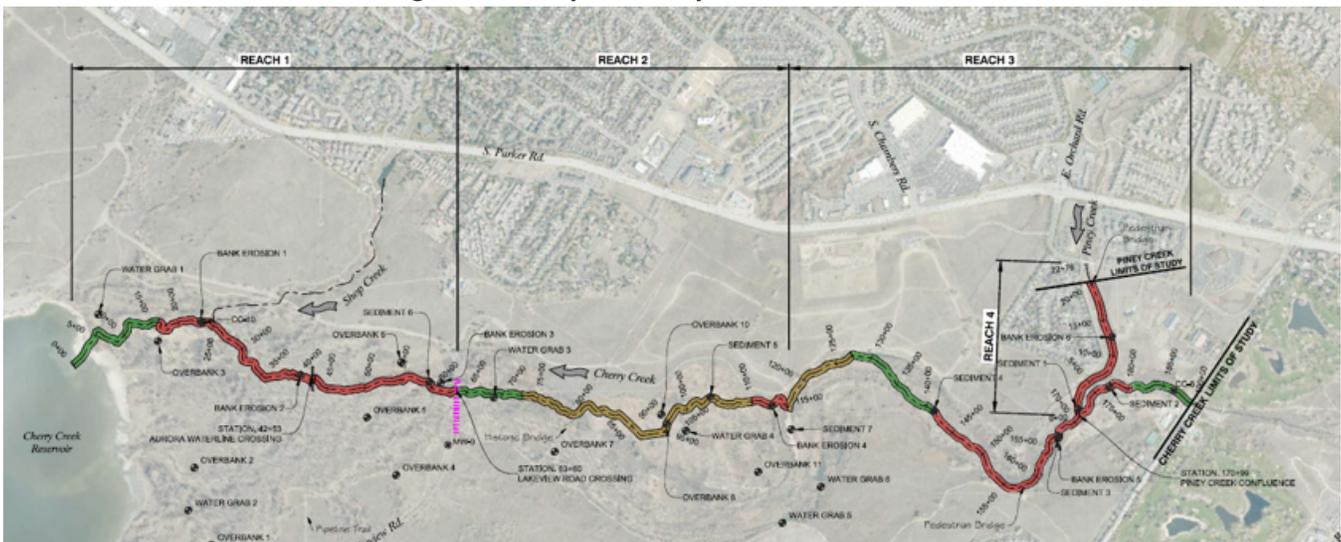
To: CCBWQA Board of Directors
From: Richard Borchardt, Pollution Abatement Project Manager
Date: April 20, 2023
Subject: Approval of Muller Engineering Scope of Work for Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1) and Preparation of Corresponding Agreement

Request: The Board:

1. Authorize continuation of design with Muller Engineering and approve the scope of work for the Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1),
2. Authorize legal counsel to prepare the necessary consulting agreement for an amount not to exceed \$256,715 for execution by a member of the executive committee.

Project: The Stream and Water Quality Assessment and Baseline Channel Monitoring Reports (Reports) include Cherry and Piney Creeks within CCSP (See **Figure 1**). CCBWQA sole-sourced the Reports to Muller Engineering (Muller) in 2020 and 2021 respectively. Muller presented their initial findings to CCBWQA at the July 15, 2021 Board Meeting and the Board accepted the Reports on December 15, 2022.

Figure 1. Cherry and Piney Creeks within CCSP



CCBWQA had a workshop on March 16, 2023 which included Cherry Creek from the Reservoir to the Aurora Soccer fields (south of Arapahoe Road) and Piney Creek from the confluence with Cherry Creek to Parker Road. In the workshop, Reach 1 was presented as the top priority as it has an average sediment loss of 2,143 tons per year and 1684 pounds of phosphorus per year directly to the Reservoir.

Muller Engineering prepared the attached scope of work and fee for Reach 1 which includes Alternatives Analysis for a cost of \$256,715 and Concept Design of Selected Alternative for a cost of \$180,847. I believe that Muller's fees are in alignment with current market conditions and are reasonable for their scope of works. Muller anticipates 7 months for the Alternatives Analysis, which is achievable in 2023. CCBWQA could contract for the Alternatives Analysis in 2023 and

defer the Concept Design of Selected Alternative to 2024; this approach fits best within CCBWQA's 10-year CIP.

I recommend CCBWQA continue working with Muller Engineering, based on their successful completion of the Reports, their work on the Cherry Creek Major Drainageway Planning Study which continued upstream to Scott Road, their effective engagement in the March 16, 2023 workshop, and their previous experience and success on Plum Creek in Chatfield State Park.

TAC Review: TAC recommended that the Board contract directly with Muller Engineering for the Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1) and authorize the preparation and execution of necessary consulting agreement, and an expenditure of \$256,715.

Budget: CCBWQA's Capital Improvement Program includes \$200,000 for an Alternatives Analysis on Cherry Creek from Reservoir to Lake View Drive. CCBWQA's 2023 CIP budget also includes \$2,111,000 for East Shade Shelters, Cherry Creek at Arapahoe (R 3-4), and McMurdo Gulch projects. It is likely that these projects will be delayed past 2023 due to partner funding constraints and/or revised schedules; therefore, this 2023 funding could be reallocated to cover the additional \$56,715 in CCBWQA funding needed.

Motion: **I move that the Board:**

- 1. Authorize continuation of design with Muller Engineering and approve the scope of work for the Alternatives Analysis on Cherry Creek from the Reservoir to Lake View Drive (aka Reach 1),**
- 2. Authorize legal counsel to prepare the necessary consulting agreement for an amount not to exceed \$256,715 for execution by a member of the executive committee.**

April 14, 2023

Manager
Cherry Creek Basin Water Quality Authority
PO Box 3166
Centennial, CO 80111

RE: Scope of Services for Cherry Creek Reach 1 Alternatives Analysis and Conceptual Design

Dear Manager:

Muller Engineering Company, Inc. (Muller) would like to thank you for the opportunity to work with the Cherry Creek Basin Water Quality Authority (CCBWQA) to perform the alternatives analysis for Reach 1 of Cherry Creek which extends from the Cherry Creek Reservoir south, approximately 6,500 feet, to Lakeview Drive within the Cherry Creek State Park boundary. The purpose of the analysis is to develop alternatives for the restoration of Cherry Creek that reduce sediment and phosphorus loading to the reservoir, preserve and enhance natural resources, and protect existing infrastructure. Construction cost estimates will also be produced along with pros and cons for each alternative. The analysis also includes development of a conceptual design for a selected alternative to further refine the layout developed during the alternatives analysis and to refine the estimated construction costs for the Reach 1 improvements.

It is anticipated that the work will be contracted in phases with the alternatives analysis occurring in 2023 as Phase 1 and the conceptual design of the selected alternative will occur in 2024 as Phase 2. The following sections outline the scope and fee and have been broken out by phases.

I. Phase 1: Alternatives Analysis

A. Scope of Work

The scope of work will include the following items summarized below:

1. Project management, Meetings, and Coordination

The following tasks are included in the scope of work:

- **Project Management:** Muller will complete project setup, preparation of sub consultant agreements, and monthly invoicing for 7 months.
- **Coordination:** Muller will complete as needed e-mail and phone coordination with CCBWQA for 7 months.
- **Progress Meetings:** Assume 3 virtual progress meetings with CCBWQA staff.
- **Meetings:** Muller will attend 2 in-person meetings, one with the CCBWQA TAC and one with the CCBWQA Board.



2. Alternatives evaluation

The following tasks are included in the scope of work:

- **Site Visits and Geomorphic Evaluation:** Muller will perform two site visits, one to visit Reach 1 with the internal consulting team and a second site visit to a reference reach site and collect bankfull channel measurements. Muller will review existing hydrology and bankfull discharge estimates based on the collected field measurements and perform a geomorphic evaluation of the reference reach, existing reach, and apply this analysis to the proposed design. A conceptual hydraulic evaluation will also be performed including a two section HEC-RAS model of a representative reach to size a preliminary bankfull channel and perform approximate rock sizing calculations. Secondary channels will be assessed using the existing SRH2D model.
- **Alternative 1 – Stabilize Existing Main Channel:** Muller will develop an alternative to stabilize the existing main channel in the current horizontal location, minimal improvements to Lakeview Drive culverts, and minimal secondary channel improvements. The alternative development will include a sketch layout of the channel improvements and the Lakeview Drive improvements, culvert hydraulics at Lakeview Drive using the Lakeview Drive HEC-RAS model developed by RESPEC to model minimal upgrades to the existing culverts, and the preparation of 5 to 7 plan, profile, and typical channel section sheets.
- **Alternative 2 – Shift Main Channel East to Historic Valley Low-Point with Overflow Channel:** Muller will develop an alternative to shift the main channel east to the valley low-point, develop up to two secondary channels, and moderate improvements to the Lakeview Drive culverts required to support this alternative. The alternative development will include a sketch layout of the channel improvements and the Lakeview Drive improvements, culvert hydraulics at Lakeview Drive using the Lakeview Drive HEC-RAS model developed by RESPEC to model upgrades to several of the existing culverts, and the preparation of 5 to 7 plan, profile, and typical channel section sheets.
- **Alternative 3 – Shift Main Channel East to Historic Valley Low-Point with Multiple Overflow Channels:** Muller will develop an alternative to shift the main channel east to the valley low-point, develop multiple secondary channels, and extensive improvements to the Lakeview Drive culverts required to support this alternative. The alternative development will include a sketch layout of the channel improvements and the Lakeview Drive improvements, culvert hydraulics at Lakeview Drive using the Lakeview Drive HEC-RAS model developed by RESPEC to model upgrades to most of the existing culverts, and the preparation of 5 to 7 plan, profile, and typical channel section sheets.
- **Water Quality Analysis:** Muller will provide qualitative and approximate quantitative assessment of water quality benefits for three alternatives. This task includes coordination with CCBWQA consultants and TAC, research on treatment effectiveness associated with stream rehabilitation and overbank infiltration and wetland processes, and consideration of follow-up bench-scale or field testing to prove-out treatment concepts.
- **Conceptual Construction Costs and Design Report:** Muller will estimate construction quantities and prepare conceptual level engineer's opinion of probable construction costs for three alternatives. Muller will document the three alternatives, water quality analysis, and construction cost estimates in an alternatives analysis design report.

3. Special Services

The following tasks are included in the scope of work:

Ecological Services: ERO will identify existing conditions and restoration opportunities in Reach 1 including mapping of vegetation communities and a high-level quality assessment with a memo to document the results. ERO will consult with project team to provide ecological and USACOE 404 permitting input on three alternatives for the restoration of Cherry Creek and the adjacent floodplain. The scope includes one site visit, three internal virtual team meetings, and one in person TAC meeting. A more detailed scope of work for services provided by ERO is attached to this scope and fee.

Geomorphology and Sediment Transport Services: Alden will provide geomorphic and sediment transport qualitative input on three alternatives. Includes a virtual internal project kickoff meeting, 1 site visit, 3 internal virtual meetings for alternatives analysis, a review of available information and assessment of processes impacting the park, and review and input of three alternatives. A more detailed scope of work for services provided by Alden is attached to this scope and fee.

As Needed Services: Muller and ERO will reserve this time for partner outreach and check in with CCBWQA consulting staff, executive committee, TAC, and Board for coordination of project to be billed at a time and materials basis and will be as directed by CCBWQA.

4. Deliverables

The following deliverables are included in the scope of work:

- **Plan, Profile, and Typical Channel Cross Section Sheets:** Muller will prepare 5 to 7 plan, profile, and typical channel section sheets for each of the three alternatives using available LiDAR and aerial photography to document the layout and improvements assumed for each alternative.
- **Conceptual Level Construction Cost Estimates:** Muller will provide conceptual level construction cost estimates for each of the three alternatives.
- **Alternatives Analysis Design Report:** Muller will prepare an alternatives analysis design report to document each of the three alternatives, the water quality analysis, and the construction cost estimates.

B. Assumptions and Exclusions

The following is a list of assumptions and exclusions used in preparation of this scope and fee:

- A 7-month project duration is assumed for Phase 1: Alternatives Analysis.
- A landscape architect has not been contracted as part of this phase of work. Landscape plans will be limited to planting zones (wetland/riparian/upland) as directed by the ecologist.
- Preparation of a 404 Permit, CSQT, or any other required permits are not included in this scope and fee.
- Calculations of Environmental Functional Units (EFU's) or SACWET are not included in this scope and fee.

- Sediment transport will be limited to a qualitative assessment, no sediment transport capacity calculations are included in this scope.

C. Fee

We estimate that the fee associated with this scope of work will not exceed **\$256,715**. Below is a breakdown of the fee:

Task	Muller	ERO	Alden	Total
Project Management and Meetings	\$31,622	-	-	\$31,622
Alternatives Evaluation	\$162,777	-	-	\$162,777
Special Services	\$9,940	\$35,421	\$16,955	\$62,316
Sub Total	\$204,339	\$35,421	\$16,955	
Total Fee				\$256,715

A project fee estimating sheet from Muller and from the sub-consultants are attached which provides a breakdown of our anticipated staff time by task and a schedule of our 2023 hourly rates.

D. SCHEDULE

We anticipate completing the Phase 1: Alternatives Analysis and providing the deliverables within approximately seven months of receiving the notice to proceed.

II. PHASE 2: CONCEPTUAL DESIGN OF SELECTED ALTERNATIVE

A. Scope of Work

The scope of work will include the following items summarized below:

1. Project management, Meetings, and Coordination

The following tasks are included in the scope of work:

- **Project Management:** Muller will complete project setup, preparation of sub consultant agreements, and monthly invoicing for 4 months.
- **Coordination:** Muller will complete as needed e-mail and phone coordination with CCBWQA for 4 months.
- **Progress Meetings:** Assume 2 virtual progress meetings with CCBWQA staff.
- **Board Meeting:** Muller will attend 1 in-person meetings with the CCBWQA Board.

2. Conceptual Design of Selected Alternative

The following tasks are included in the scope of work:

- **Selected Alternative Development:** Muller will perform a site visit to assist in the refinement of the main channel, secondary channels, and Lakeview Drive culverts. Muller will develop a conceptual design by refining the layouts for the selected alternatives based on feedback from the CCBWQA TAC. Muller will prepare a conceptual level SRH2D model of Reach 1 including rough grading using AutoCAD corridors with minimal cleanup to allow the model to run. Muller will also refine the WQ evaluation to reflect the refinements of the selected alternative.
- **Conceptual Channel Plans:** Muller will prepare conceptual level plans for the selected alternative including a title sheet, a site plan, up to three plan and profile sheets, typical channel sections for the main and secondary channels, and will include conceptual and typical grade control and bank protection details. A plan and profile will also be included for the culvert improvements at Lakeview Drive.
- **Conceptual Construction Costs and Design Report:** Muller will refine the construction quantities and prepare conceptual level engineer's opinion of probable construction costs for the conceptual design of the selected alternative. Muller will document the conceptual design, water quality analysis, and construction cost estimates in a conceptual design report.

3. Special Services

The following tasks are included in the scope of work:

Ecological Services: ERO will consult with the project team to provide ecological and USACOE 404 permitting input on the selected alternative and conceptual design for the restoration of Cherry

Creek and the adjacent floodplain. A more detailed scope of work for services provided by ERO is attached to this scope and fee.

Groundwater Monitoring Wells: ERO will coordinate and install up to six groundwater monitoring wells outfitted with a pressure transducer and a barometric logger and provide 1-year of quarterly data collection. A more detailed scope of work for services provided by ERO is attached to this scope and fee.

Geomorphology and Sediment Transport Services: Alden will provide geomorphic and sediment transport qualitative input on the selected alternative and conceptual design. The scope includes 1 internal virtual meeting and time to review and provide input on concept design. A more detailed scope of work for services provided by Alden is attached to this scope and fee.

As Needed Services: Muller and ERO will reserve this time for partner outreach and check in with CCBWQA consulting staff, executive committee, TAC, and Board for coordination of project to be billed at a time and materials basis and will be as directed by CCBWQA.

4. Deliverables

The following deliverables are included in the scope of work:

- **Plan, Profile, Typical Channel Cross Sections, and Typical Detail Sheets:** Muller will prepare a conceptual level plan set including plan, profile, typical channel section, and typical detail sheets for the selected alternative.
- **Conceptual Level Construction Cost Estimates:** Muller will provide a refined conceptual level construction cost estimate for the selected alternative.
- **Conceptual Design Report:** Muller will prepare a conceptual design report to document the selected alternative improvements, the refined water quality analysis, and the refined construction cost estimates.

B. Assumptions and Exclusions

The following is a list of assumptions and exclusions used in preparation of this scope and fee:

- A 4-month project duration is assumed for Phase 2: Concept Design of Selected Alternative.
- A landscape architect has not been contracted as part of this phase of work. Landscape plans will be limited to planting zones (wetland/riparian/upland) as directed by the ecologist.
- Preparation of a 404 Permit, CSQT, or any other required permits are not included in this scope and fee.
- Calculations of Environmental Functional Units (EFU's) or SACWET are not included in this scope and fee.
- It is assumed that the Phase 2 work will occur in 2024 and that this fee will be revised to use 2024 billing rates prior to executing the final agreement.
- The number of groundwater monitoring wells is assumed and is anticipated to be refined during the Phase 1 work. The fee should be considered a placeholder and will need to be adjusted to meet the project needs prior to executing the agreement for Phase 2.

- Sediment transport will be limited to a qualitative assessment, no sediment transport capacity calculations are included in this scope.

C. Fee

We estimate that the fee associated with this scope of work will not exceed **\$180,847**. Below is a breakdown of the fee:

Task	Muller	ERO	Alden	Total
Project Management and Meetings	\$19,774	-	-	\$19,774
Conceptual Design of Selected Alternative	\$108,706	-	-	\$108,706
Special Services	\$5,080	\$18,330	\$3,957	\$27,367
Groundwater Monitoring Wells	-	\$25,000	-	\$25,000
Sub Total	\$133,560	\$43,330	\$3,957	
Total Fee				\$180,847

A project fee estimating sheet from Muller and from the sub-consultants are attached which provides a breakdown of our anticipated staff time by task and a schedule of our 2023 hourly rates.

D. SCHEDULE

We anticipate completing the Phase 2: Conceptual Design of Selected Alternative and providing the deliverables within approximately four months of receiving the notice to proceed.

We look forward to working with you and assisting the Cherry Creek Basin Water Quality Authority with this analysis. If you have any questions or concerns related to the scope and fee, please don't hesitate to call.

Sincerely,

MULLER ENGINEERING COMPANY, INC.



John Yager
Water Resources Project Manager



Derek Johns
Principal

Enclosures (Muller, ERO, and Alden Fee Estimates)

CC: CCBWQA Manager (Jane Clary and Val Endyk), R2R (Rich Borchardt)

MULLER ENGINEERING COMPANY
PROJECT FEE ESTIMATE



CLIENT:

Cherry Creek Basin Water Quality Authority

PROJECT:

Cherry Creek Reach 1: Phase 1 Alternatives Analysis

PROPOSAL NO.: 923.22

PREPARED BY: JAY

CHECKED BY: DDJ/JTW

PROJECT NO.: 20-023.04

DATE: 4/14/2023

PROPOSED TOTAL FEE: \$ 256,715

TASK NO.	ITEM DESCRIPTION	LABOR (HOURS)								EXPENSES					TOTALS			
		Senior Project Manager 9	Senior Project Manager 9	Project Manager 7L	Project Engineer SL	Design Engineer 3	EG Analyst	Mechanic/CADD Operator 4	Administrative Support	OUTSIDE SERVICES	TRAVEL	REPRODUCTION	DELIVERY	MISCELLANEOUS	TIME (HOURS)	LABOR COST	EXPENSES	SUB TOTAL
	2023 Billing Rate>>>	\$242	\$242	\$208	\$166	\$140	\$132	\$123	\$81									
100	PROJECT MANAGEMENT AND MEETINGS																	
	Project management including sub-consultant agreements and preparation of monthly invoices and progress reports. (Assume 7 months)			10	16										26	\$ 4,736		\$ 4,736
	Phone and e-mail coordination with the CCBWQA. (7-months)			14	14										28	\$ 5,236		\$ 5,236
	Progress Meetings: assume 3 virtual progress meetings w/CCBWQA	5	5	8	8	8									34	\$ 6,532		\$ 6,532
	TAC Meetings: Assume in person meetings, one TAC meeting and one board meeting.	12	12	20	20	12				\$ 150					76	\$ 14,968	\$ 150	\$ 15,118
	SUBTOTAL													164	\$ 31,472	\$ 150		\$ 31,622
110	ALTERNATIVES EVALUATION																	
	Site Visits and Geomorphic Evaluation																	
	Site visit and bankfull measurements.	10	10	10	12	12				\$ 150			\$ 350		54	\$ 10,592	\$ 500	\$ 11,092
	Reference reach site visit and bankfull measurements			4	6	6				\$ 75			\$ 350		16	\$ 2,668	\$ 425	\$ 3,093
	Review existing hydrology and bankfull discharge estimates based on field measurements			4	6	8									18	\$ 2,948		\$ 2,948
	Geomorphic Evaluation of existing conditions, reference reach, and proposed design (bankfull dimensions, sinuosity, meander wavelength, pool-to-pool spacing, etc.)	0	2	4	8	16									30	\$ 4,884		\$ 4,884
	Hydraulics evaluation (quick 2 section HEC-RAS modeling of representative reach to size primary bankfull channel and to perform approximate rock sizing calculations, assess existing secondary channel hydraulics using existing 2D model)	2	4	12	16	24									58	\$ 9,964		\$ 9,964
	Alternative 1 - Stabilize Existing Main Channel																	
	Sketch Layout restoration of main channel improvements (6500 LF)	4	4	8	8	16									40	\$ 7,168		\$ 7,168
	Sketch Layout improvements at existing Lakeview Road Culverts (u/s control weir, d/s erosion protection)	2	4	6	8	16									36	\$ 6,268		\$ 6,268
	Culvert hydraulics evaluation (HEC-RAS modeling of minimal upgrades to the existing culverts under Lakeview Drive using the RESPEC model as a starting point)			2	4	8									18	\$ 3,100		\$ 3,100
	Prepare channel plan (3 sheets at 1"=200'), profile main channel, channel cross sections, and plan view of Lakeview Drive Culvert improvements (7 sheets total)			8	12	24									64	\$ 9,476		\$ 9,476
	Alternative 2 - Shift Main Channel East to Historic Valley Low Point with Overflow Channel																	
	Sketch Layout restoration of main channel improvements (6500 LF)	4	4	8	8	16									40	\$ 7,168		\$ 7,168
	Sketch Layout restoration of two secondary channel improvements	4	4	8	8	12									36	\$ 6,608		\$ 6,608
	Sketch Layout improvements at existing Lakeview Road Culverts with new main channel box culvert (u/s control weir, new box culvert, d/s erosion protection)	4	6	8	8	12									38	\$ 7,092		\$ 7,092
	Hydraulics evaluation (HEC-RAS modeling of a representative reach for a system with two secondary channels)		1	4	6	8									19	\$ 3,190		\$ 3,190
	Culvert hydraulics evaluation (HEC-RAS modeling of upgrades to several of the existing culverts under Lakeview Drive using the RESPEC model as a starting point)		2	4	6	12									24	\$ 3,992		\$ 3,992
	Prepare channel plan (3 sheets at 1"=200'), profile main channel, channel cross sections, and plan view of Lakeview Drive Culvert improvements (7 sheets total)			8	12	24									56	\$ 8,492		\$ 8,492
	Alternative 3 - Shift Main Channel East to Historic Valley Low Point with Multiple Overflow Channels																	
	Sketch Layout restoration of main channel improvements (6500 LF)	2	2	4	4	8									20	\$ 3,584		\$ 3,584
	Sketch Layout restoration of multiple secondary channel improvements	4	4	8	8	12									36	\$ 6,608		\$ 6,608
	Sketch Layout improvements at existing Lakeview Road Culverts with new main channel box culvert and new overflow culverts (u/s control weir, new box culvert, d/s erosion protection)	4	6	8	12	20									50	\$ 8,876		\$ 8,876
	Hydraulics evaluation (HEC-RAS modeling of a representative reach for a system with multiple secondary channels)		1	4	6	8									19	\$ 3,190		\$ 3,190
	Culvert hydraulics evaluation (HEC-RAS modeling of full replacement of the existing culverts under Lakeview Drive using the RESPEC model as a starting point)		2	4	6	12									24	\$ 3,992		\$ 3,992
	Prepare channel plan (3 sheets at 1"=200'), profile main channel, channel cross sections, and plan view of Lakeview Drive Culvert improvements (7 sheets total)			8	12	24									56	\$ 8,492		\$ 8,492
	Water Quality Analysis																	
	Provide qualitative and approximate quantitative assessment of water quality benefits for three alternatives. Task includes coordination with CCBWQA consultants and TAC, research on treatment effectiveness associated with stream rehabilitation and overbank infiltration and wetland processes, and consideration of follow-up bench-scale or field testing to prove-out treatment concepts.	18		24		18									60	\$ 11,868		\$ 11,868
	Conceptual Construction Costs and Design Report																	
	Construction cost estimate for 3 alternatives		6	12	18	24									60	\$ 10,296		\$ 10,296
	Alternatives Analysis Design Report	8	4	16	24	8									60	\$ 11,336		\$ 11,336
	SUBTOTAL													932	\$ 161,852	\$ 925		\$ 162,777
120	SPECIAL SERVICES																	
	Ecology and 404 Permitting (ERO): Identify existing conditions and restoration opportunities including mapping of vegetation communities and a high level quality assessment with a memo to document the results. Consult with project team to provide ecological and USACE 404 permitting input on three alternatives for the restoration of Cherry Creek and the adjacent floodplain. Including one site visit, three internal virtual team meetings, and in person TAC meetings.									\$ 31,421								\$ 31,421
	Geomorphology and Sediment Transport (Alden): Provide geomorphic and sediment transport qualitative input on three alternatives. Includes a virtual internal project kickoff meeting, 1 site visit, 3 internal virtual meetings for alternatives analysis, a review of available information and assessment of processes impacting the park, and review and input of three alternatives.									\$ 16,955								\$ 16,955
	Muller and ERO time for partner outreach and check in with CCBWQA consulting staff, executive committee, TAC, and Board for coordination of project to be billed at a time and materials basis and will be as directed by CCBWQA.	6	10	18	14					\$ 4,000					48	\$ 9,840	\$ 4,000	\$ 13,940
	SUBTOTAL													48	\$ 9,840	\$ 4,000		\$ 23,376
	TOTAL HOURS	89	95	258	290	368	0	44	0					1144				
	TOTAL LABOR	\$ 21,538	\$ 22,990	\$ 53,664	\$ 48,140	\$ 51,520	\$ -	\$ 5,412	\$ -						\$ 203,264			
	TOTAL EXPENSES									\$ 52,376	\$ 375	\$ -	\$ -	\$ 700				\$ 53,451
	TOTAL FEE																	\$ 256,715

Exclusions and Assumptions:

1. A 7 month project duration is assumed for Phase 1: Alternatives Analysis.
2. A landscape architect has not been contracted as part of this phase of work. Landscape plans will be limited to planting zones (wetland/riparian/upland) as directed by the ecologist.
3. Preparation of a 404 Permit, CSDT, or any other required permits are not included in this scope and fee.
4. Calculations of Environmental Functional Units (EFU) or SACWT are not included in this scope and fee.
5. Sediment transport will be limited to a qualitative assessment, no sediment transport capacity calculations are included in this scope.

**MULLER ENGINEERING COMPANY
PROJECT FEE ESTIMATE**

CLIENT:

Cherry Creek Basin Water Quality Authority

PROJECT:

Cherry Creek Reach 1: Phase 2 Concept Design of Selected Alternative (Work Beginning in January of 2024)

PROPOSAL NO.: 923.22

PROJECT NO.: 20-023.04

PREPARED BY: JAY

DATE: 4/12/2023

CHECKED BY: DDJ/JTW

PROPOSED TOTAL FEE: \$ 180,847

TASK NO.	ITEM DESCRIPTION	LABOR (HOURS)							EXPENSES					TOTALS				
		Senior Project Manager 9	Senior Project Manager 9	Project Manager 7L	Project Engineer 5L	Design Engineer 3	GIS Analyst	Technician/CADD Operator	Administrative Support	OUTSIDE SERVICES	TRAVEL	REPRODUCTION	DELIVERY	MISCELLANEOUS	TIME (HOURS)	LABOR COST	EXPENSES	SUBTOTAL
200	PROJECT MANAGEMENT AND MEETINGS																	
	2023 Billing Rate>>>	\$242	\$242	\$208	\$166	\$140	\$132	\$123	\$93									
	Project management including sub-consultant agreements and preparation of monthly invoices and progress reports. (Assume 4 months)			8	12										20	\$ 3,656		\$ 3,656
	Phone and e-mail coordination with the CCBWQA. (4-months)			8	8										16	\$ 2,992		\$ 2,992
	Progress Meetings: assume 2 virtual progress meetings w/CCBWQA	4	4	6	8	8									30	\$ 5,632		\$ 5,632
	Board Meetings: Assume 1 in person meeting to present the selected alternative.	8	4	10	10	5				\$ 150					37	\$ 7,344	\$ 150	\$ 7,494
	SUBTOTAL														103	\$ 49,624	\$ 150	\$ 49,774
210	CONCEPTUAL DESIGN OF SELECTED ALTERNATIVE																	
	Selected Alternative Development																	
	Site Visit	10	10	10	12	12				\$ 150				\$ 350	54	\$ 10,592	\$ 500	\$ 11,092
	Refine layout of main channel restoration improvements	4	4	12	16	16									52	\$ 9,328		\$ 9,328
	Refine Layout of secondary channel improvements	2	4	8	12	16									42	\$ 7,348		\$ 7,348
	Refine Layout improvements at existing Lakeview Road Culverts	1	2	6	6	12									27	\$ 4,650		\$ 4,650
	2D Model hydraulics evaluation of selected alternative including rough grading using AutoCAD corridors with minimal cleanup to allow the model to run.	6	12	24	44	60									146	\$ 25,052		\$ 25,052
	Refine WQ evaluation (estimate reduction in sediment/phosphorous loading)	12		16		8									36	\$ 7,352		\$ 7,352
	Conceptual Channel Plans																	
	Refine channel plan (3 sheets at 1"=200'), profile main channel, channel cross sections, and plan view of Lakeview Drive Culvert improvements (7 sheets total)			8	10	16		14							48	\$ 7,286		\$ 7,286
	Add title sheet, site plan sheet			2	4	4		8							18	\$ 2,624		\$ 2,624
	Add typical sections for main channel and secondary channels			4	4	8		6							22	\$ 3,354		\$ 3,354
	Add typical riffle details			4	6	8		12							30	\$ 4,424		\$ 4,424
	Add typical bank protection details			4	2	4		6							16	\$ 2,462		\$ 2,462
	Add profile of Lakeview Drive Culvert improvements			2	4	6		6							18	\$ 2,658		\$ 2,658
	Conceptual Construction Costs and Design Report																	
	Construction cost estimate for conceptual design		2	6	8	12									28	\$ 4,740		\$ 4,740
	Conceptual Design Report	12	8	24	24	18									86	\$ 16,336		\$ 16,336
	SUBTOTAL														623	\$ 108,206	\$ 500	\$ 108,706
220	SPECIAL SERVICES																	
	Ecology and 404 Permitting (ERO): Consult with project team to provide ecological and USACE 404 permitting input on the selected alternative and conceptual design for the restoration of Cherry Creek and the adjacent floodplain.									\$ 17,330							\$ 17,330	\$ 17,330
	Groundwater Monitoring Wells (ERO): Coordinate and install groundwater monitoring wells outfitted with a pressure transducer and a barometric logger and provide 1-year of quarterly data collection (Assume up to 6 wells in Reach 1 only).									\$ 25,000							\$ 25,000	\$ 25,000
	Geomorphology and Sediment Transport (Tetra Tech): Provide geomorphic and sediment transport qualitative input on the selected alternative and conceptual design. Includes 1 internal virtual meeting and time to review and provide input on concept design.									\$ 3,957							\$ 3,957	\$ 3,957
	Muller and ERO time for partner outreach and check in with CCBWQA consulting staff, executive committee, TAC, and Board for coordination of project to be billed at a time and materials basis and will be as directed by CCBWQA.	4	6	8	6					\$ 1,000					24	\$ 5,080	\$ 1,000	\$ 6,080
	SUBTOTAL														24	\$ 5,080	\$ 47,287	\$ 52,367
	TOTAL HOURS	63	56	170	196	213	0	52	0						750			
	TOTAL LABOR	\$ 15,246	\$ 13,552	\$ 35,360	\$ 32,536	\$ 29,820	\$ -	\$ 6,396	\$ -							\$ 132,910		
	TOTAL EXPENSES									\$ 47,287	\$ 300	\$ -	\$ -	\$ 350		\$ 47,937		
	TOTAL FEE																\$ 47,937	\$ 180,847

Exclusions and Assumptions:

- An 4 month project duration is assumed for Phase 2: Concept Design of Selected Alternative.
- A landscape architect has not been contracted as part of this phase of work. Landscape plans will be limited to planting zones (wetland/riparian/upland) as directed by the ecologist.
- Preparation of a 404 Permit, CSQI, or any other required permits are not included in this scope and fee.
- Calculations of Environmental Functional Units (EFUs) or SACWET are not included in this scope and fee.
- It is assumed that the Phase 2 work will occur in 2024 and that this fee will be revised to use 2024 billing rates prior to executing the final agreement.
- The number of groundwater monitoring wells is assumed and is anticipated to be refined during the Phase 1 work. The fee should be considered a placeholder and will need to be adjusted to meet the project needs prior to executing the agreement for Phase 2.
- Sediment transport will be limited to a qualitative assessment, no sediment transport capacity calculations are included in this scope.

ERO Resources Corporation
Scope of Work for Environmental Services for
Cherry Creek Basin Water Quality Authority
Cherry Creek Reach 1
Arapahoe County, Colorado

April 4, 2023

Background

Muller Engineering, Inc. (Client), on behalf of Cherry Creek Basin Water Quality Authority (CCBWQA), has requested ERO Resources Corporation (ERO) prepare this Scope of Work (SOW) to perform the environmental services discussed below for the proposed Cherry Creek Reach 1 at Cherry Creek Reservoir State Park (Park) Study project. The project would evaluate restoration alternatives for Reach 1 through the Park in Arapahoe County, Colorado (study limits). ERO proposes the following tasks to assist with evaluating current conditions, restoration alternatives, and permitting approaches.

Task 1. Identify Existing Conditions and Restoration Opportunities

ERO will identify existing ecological conditions and any areas within the study area for wetland and riparian habitat restoration. This task would include mapping vegetation communities within the project area, completing a high-level quality assessment of the vegetation in the project area, and potential areas for enhancement or restoration. ERO will provide a memo to be included as part of an overall project documentation that summarizes the existing ecological conditions and restoration potential within the study limits.

Products

- Map identifying vegetation communities, quality assessment, and restoration or enhancement areas
- Draft and final memo discussing existing ecological conditions and restoration opportunities

Task 2. Develop Restoration Alternatives

ERO will coordinate with Muller during the study and project implementation. ERO will assist the project team with identifying potential restoration of three enhancement alternatives within the project area. ERO would also work with the project team early in the designing process to identify concept alternatives that reduce impacts to high quality wetland or riparian habitat or other sensitive natural resources. This includes meeting with Muller to review the wetland and riparian mapping, potential restoration and enhancement areas, and provide comments for the three alternatives. ERO assumes that up to six conference call meetings with Muller/project team to discuss the project will be required.

ERO will provide recommendations, and review and refine alternatives based on team meetings and a meeting with the TAC.

As part of this task, ERO will investigate the quantity of plant materials and develop cost estimates for each of the three alternatives. Following collaboration with the project team, ERO will also refine estimates and planting costs based on design changes and input from the project team. ERO will coordinate with Muller to deliver a final report with a summary of each alternative and projected restoration costs in terms of planting and revegetation.

Based on the design of the three alternatives, ERO will provide permitting constraints or approaches for each of the alternatives, including type of Clean Water Act Section 404 permit may be required, consultation on impacts to Preble's meadow jumping mouse habitat (a federally listed species), and 408 clearance.

Products

- Recommendations for areas to protect, enhance, or restore
- Provide input and collaboration on design alternatives
- Provide written documentation on permitting constraints or challenges for each alternative
- Provide quantity and cost estimate of revegetation planting materials for each alternative

Assumptions

- This task does not include any formal consultation with the Corps or other agencies or any 404 permitting or consultation with U.S. Fish and Wildlife Services.
- This includes up to 6 meetings with the project team to discuss alternatives.

Task 3. Project Management, Coordination, and Meetings

This task includes items specifically associated with contract and project management services through the duration of the contract, such as project start-up documentation, health and safety plan compliance, monthly invoicing, and project close-out documentation. This task also includes attending a one day site-meeting with the project team, a kick-off meeting, and a meeting with the TAC to present alternative designs. This task also includes ensuring that all documents and figures are reviewed for technical and editorial accuracy.

Products

- Attendance at a 1 day site meeting with the project team
- Attendance at a kickoff meeting
- Attendance at a TAC meeting to present alternative designs

Task 4. Groundwater wells

ERO will install nine shallow groundwater wells in the project area to determine how patterns in groundwater relate to existing vegetation communities and conditions. Each well will be outfitted with a pressure transducer and a barometric logger will be installed to correct water-level measurements. ERO will also collect groundwater data for the first year, collected quarterly.

Products

- Installation of 9 monitoring wells and monitoring quarterly

Assumptions

- This task assumes the wells can be installed by hand and no drill rig will be required. If the wells need to be installed deeper than can be reached by hand, then a new scope of work will be prepared.
- Groundwater monitoring will be collected up to 4 times.

Task 5. Additional Support

ERO will conduct any additional tasks necessary for the project, at the direction of the Client and CCBWA.

Estimated Costs

The above Tasks 1 and 5 will be completed on a time-and-materials basis for a cost not to exceed \$71,289 (see below and attached spreadsheet for breakout), including expenses billed at cost plus 8%.

Task 1.	Identify Existing Conditions and Restoration Opportunities	\$13,411
Task 2.	Develop Restoration Alternatives	\$24,128
Task 3.	Project Coordination and Meetings	\$9,811
Task 4.	Groundwater wells	\$21,538
Task 5.	Additional Items	\$5,000
Total		\$71,289
Estimated Costs for 2023		\$31,421
Estimated Costs for 2024		\$39,868
Total Costs		\$71,289

Total Costs

ERO Cost Proposal - Cherry Creek Reach 1 at Cherry Creek Reservoir State Park

	2023/ Unit Rate	Task 1. Identify existing conditions and restoration opportunities	Task 2. Develop restoration alternatives	Task 3. Project Management, Coordination, and Meetings	Task 4. Groundwater wells	Task 5. Additional Support	Labor Hours Total	Totals
Labor Category								
Project Principal	\$197.00	4	52	20		13	89	\$17,533
Biologist II	\$128.00	48	100	20	60	14	242	\$30,976
Staff Biologist	\$109.00	40			60		100	\$10,900
GIS	\$78.00	16	8		6	8	38	\$2,964
Word Processing/Editor	\$109.00	2	4				6	\$654
Administrative Staff	\$92.00			6			6	\$552
Bulk Additional Costs/Items								
Total Labor Hours		110	164	46	126	35	481	
Total Labor		\$12,758	\$24,104	\$7,052	\$14,688	\$4,977		\$63,579
Expenses	Unit Rate	Task 1. Identify existing conditions and restoration opportunities	Task 2. Develop restoration alternatives	Task 3. Project Management, Coordination, and Meetings	Task 4. Groundwater wells	Task 5. Additional Support	Totals Quantities	Totals
Field Equipment Charges	\$10.000	2			2		4	\$40
Mileage	\$0.625	500		200	400	34	1,134	\$709
Photocopy (color/8.5x11)	\$0.300	50	50	50	50		200	\$60
Photocopy (b&w/8.5x11)	\$0.150	50	50	50	50		200	\$30
RTK rental	\$275.000				2		2	\$550
Well materials	\$500.000				11		11	\$5,500
GPS Rental (per day)	\$125.000	2					2	\$250
Total Expenses		\$605	\$23	\$148	\$6,343	\$21		\$7,139
8% markup		\$48	\$2	\$12	\$507	\$2		\$571
Total estimated costs		\$13,411	\$24,128	\$7,211	\$21,538	\$5,000		\$71,289

2023 Costs

ERO Cost Proposal - Cherry Creek Reach 1 at Cherry Creek Reservoir State Park

Labor Category	2023/ Unit Rate	Task 1. Identify existing conditions and restoration opportunities	Task 2. Develop restoration alternatives	Task 3. Project Management, Coordination, and Meetings	Task 5. Additional Support	Labor Hours Total	Totals
Project Principal	\$197.00	4	26	10	6	46	\$9,062
Biologist II	\$128.00	48	50	10	7	115	\$14,720
Staff Biologist	\$109.00	40				40	\$4,360
GIS	\$78.00	16	6		4	26	\$2,028
Word Processing/Editor	\$109.00	2				2	\$218
Administrative Staff	\$92.00			3		3	\$276
Bulk Additional Costs/Items							
Total Labor Hours		110	82	23	17	232	
Total Labor		\$12,758	\$11,990	\$3,526	\$2,390		\$30,664
Expenses	Unit Rate	Task 1. Identify existing conditions and restoration opportunities	Task 2. Develop restoration alternatives	Task 3. Project Management, Coordination, and Meetings	Task 5. Additional Support	Totals Quantities	Totals
Field Equipment Charges	\$10.000	2				2	\$20
Mileage	\$0.625	500		100	17	617	\$386
Photocopy (color/8.5x11)	\$0.300	50	25	25		100	\$30
Photocopy (b&w/8.5x11)	\$0.150	50	25	25		100	\$15
RTK rental	\$275.000					0	\$0
Well materials	\$500.000					0	\$0
GPS Rental (per day)	\$125.000	2				2	\$250
Total Expenses		\$605	\$11	\$74	\$11		\$701
8% markup		\$48	\$1	\$6	\$1		\$56
Total estimated costs		\$13,411	\$12,002	\$3,606	\$2,401		\$31,421

2024 Costs

ERO Cost Proposal - Cherry Creek Reach 1 at Cherry Creek Reservoir State Park

Labor Category	2023/ Unit Rate	Task 2. Develop restoration alternatives	Task 3. Project Management, Coordination, and Meetings	Task 4. Groundwater wells	Task 5. Additional Support	Labor Hours Total	Totals
Project Principal	\$197.00	26	10		7	43	\$8,471
Biologist II	\$128.00	50	10	60	7	127	\$16,256
Staff Biologist	\$109.00			60		60	\$6,540
GIS	\$78.00	2		6	4	12	\$936
Word Processing/Editor	\$109.00	4				4	\$436
Administrative Staff	\$92.00		3			3	\$276
Bulk Additional Costs/Items							
Total Labor Hours		82	23	126	18	249	
Total Labor		\$12,114	\$3,526	\$14,688	\$2,587		\$32,915
Expenses	Unit Rate	Task 2. Develop restoration alternatives	Task 3. Project Management, Coordination, and Meetings	Task 4. Groundwater wells	Task 5. Additional Support	Totals Quantities	Totals
Field Equipment Charges	\$10.000			2		2	\$20
Mileage	\$0.625		100	400	17	517	\$323
Photocopy (color/8.5x11)	\$0.300	25	25	50		100	\$30
Photocopy (b&w/8.5x11)	\$0.150	25	25	50		100	\$15
RTK rental	\$275.000			2		2	\$550
Well materials	\$500.000			11		11	\$5,500
GPS Rental (per day)	\$125.000					0	\$0
Total Expenses		\$11	\$74	\$6,343	\$11		\$6,438
8% markup		\$1	\$6	\$507	\$1		\$515
Total estimated costs		\$12,126	\$3,606	\$21,538	\$2,598		\$39,868

April 5, 2023

Re: Scope of Work and Cost Estimate to support development of 30% level channel improvement designs for Reach 1 in Cherry Creek State Park.

Dear Mr. Yager

Alden is pleased to provide the following Scope of Work and cost estimate to provide technical support to Muller Engineering in the development of 30% level designs for channel improvements along Reach 1 of Cherry Creek within Cherry Creek State Park.

Scope of Work

The cost estimate is based on the following tasks:

Task 1: Project Kickoff:

- a. Project setup
- b. Participate in one 2-hr virtual kickoff meeting.

Task 2: Review of Information:

- a. Review of available information
- b. Review of previous studies

Task 3: Reach 1 Design Alternative 1 Support:

- a. Prepare for and participate in one 2-hr virtual workshop with Muller to develop initial concepts for Alternative 1 design.
- b. Review and comment on channel geometry recommendations developed by Muller

Task 4: Reach 1 Design Alternatives 2 & 3 Support:

- a. Prepare for and participate in one 3-hr virtual workshop with Muller to develop initial concepts for Alternatives 2 and 3 design.
- b. Review and comment on channel geometry recommendations developed by Muller

Task 5: Site Visit:

- a. Prepare for and participate in one 1-day site visit of the project reach with Muller team.

Task 6: Selected Alternative Refinement Support (to be contracted in 2024):

- a. Prepare for and participate in one 2-hr virtual workshop with Muller to review design alternatives and identify recommended Selected Alternative and propose potential refinements to Selected Alternative.
- b. Review and comment on channel geometry refinements developed by Muller

Cost Estimate

Alden proposes to complete the identified scope of work above on a time-and-material-basis, not to exceed \$20,912 without written authorization from Muller Engineering. Of the \$20,912, \$16,955 is expected to be contracted in 2023, and the remainder in 2024. A breakdown by task is provided in **Attachment A**.

Thank you for the opportunity to provide this proposal. If you have any questions, please do not hesitate to contact me at 970-852-6036 or cmorris@aldenlab.com.

Sincerely,

Alden Research Lab



Chad Morris, PE
Project Manager



**Attachment A
Cost Estimate to Support 30% Level Design of Cherry Creek Reach 1**

		Principal Engineer/ Geomorphologist		Sr. Engineer		GIS/CAD Specialist		Subtotal Hours	Labor Subtotal	ODCs (Ordinary Direct Costs)*	Subtotal
		\$250		\$232		\$137					
Task	Description	Hours	Fee	Hours	Fee	Hours	Fee				
	Support of Reach 1 Alternatives Analysis										
1	Project Kickoff	2	\$500	4	\$928		\$0	6	\$1,428		\$1,428
2	Review of available information	6	\$1,500	8	\$1,856		\$0	14	\$3,356		\$3,356
3	Reach 1 Design Alternative 1 Support	4	\$1,000	8	\$1,856	1	\$137	13	\$2,993		\$2,993
4	Reach 1 Design Alternatives 2 & 3 Support	6	\$1,500	10	\$2,320	1	\$137	17	\$3,957		\$3,957
5	Site Visit (1 day)	10	\$2,500	10	\$2,320	1	\$137	21	\$4,957	\$264	\$5,221
	2023 Subtotal (to be contracted in 2023)	28	\$7,000	40	\$9,280	3	\$411	71	\$16,691	\$264	\$16,955
6	Selected Alternative Refinement Support	6	\$1,500	10	\$2,320	1	\$137	17	\$3,957		\$3,957
	2024 Subtotal Estimate (to be contracted in 2024)	6	\$1,500	10	\$2,320	1	\$137	0	\$3,957	\$0	\$3,957
	Total	34	\$8,500	50	\$11,600	4	\$548	71	\$20,648	\$264	\$20,912

*Includes cost plus G&A of 15%.

We Need Your Help to Protect Cherry Creek and the Reservoir!

Where:

Cherry Creek State Park (CCSP, see Figure 1) and Cherry Creek Reservoir serve as an oasis for the Denver metro area and Colorado Front Range. CCSP is in Arapahoe County, surrounded by Denver, Greenwood Village, Aurora, and Centennial. CCSP sees over 2 million park visitors annually that enjoy the natural resources and recreation provided by Cherry Creek and the Reservoir.

Who:

The Cherry Creek Basin Water Quality Authority (CCBWQA) and Colorado Parks and Wildlife (CPW) are working to protect the water quality in Cherry Creek and the Reservoir. For more, see <https://www.cherrycreekbasin.org/>.

Issue:

Severe erosion (see photos 1 and 2) is occurring in Cherry Creek in CCSP and in Piney Creek immediately upstream. The erosion is threatening the surrounding environment, wildlife corridors, critical infrastructure, and water quality. Additionally, downed trees could become debris in a large flood event potentially impacting the flood control purpose of the Reservoir.

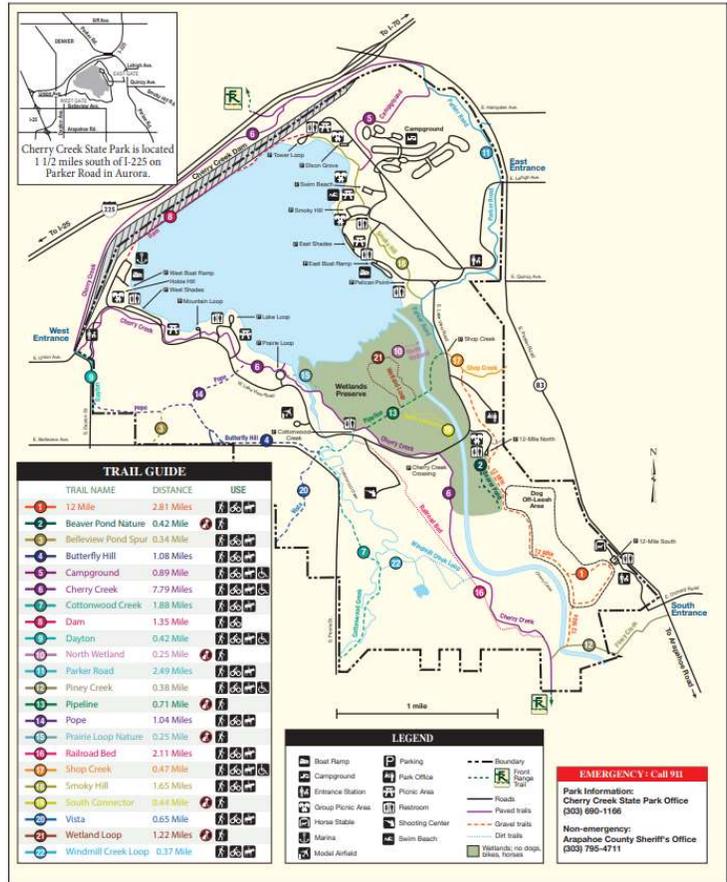


Figure 1 - Cherry Creek State Park



Photo 1 – Cherry Creek in CCSP



Photo 2 – Cherry Creek upstream of CCSP



We Need Your Help to Protect Cherry Creek and the Reservoir!

Background:

Muller Engineering Company recently completed a stream channel and water quality assessment on Cherry and Piney Creeks (see Figure 2) for CCBWQA that identified serious issues requiring a major capital investment to repair. Key findings include:

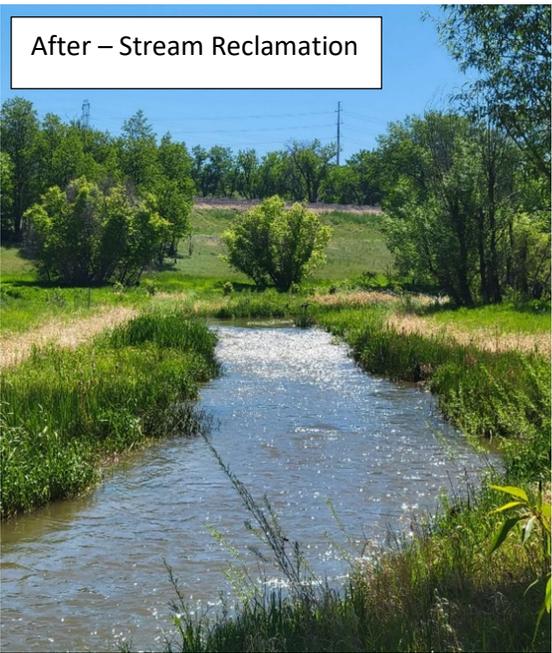
- erosion in the lower reach of Cherry Creek is estimated to contribute over 1,700 pounds of phosphorus per year, which can contribute to harmful algal blooms in the reservoir,
- initial estimate of channel reclamation cost is over \$23 million within the park and an additional \$10 million upstream of the park, which exceeds the combined resources of CCBWQA and Cherry Creek State Park. A more detailed alternatives evaluation is being completed to identify a phased approach to the project and to refine project costs, and
- risks of inaction include continued erosion, environmental impacts, loss of wildlife habitat and natural resources, risk to infrastructure including a water supply pipeline and roads, significant on-going phosphorus and sediment loading to the Reservoir, and increased damages when flooding occurs.

Our Request:

Because of the high capital cost needed to complete these repairs in a timely manner, CCBWQA and CPW are seeking funding partners to support stream reclamation similar to the example shown in Photos 3 and 4 in Chatfield State Park. In 2023, CCBWQA is preparing an alternatives analysis that will result in a refined plan for reclamation and a refined cost estimate. We are currently identifying partners who may be able to help fund this high priority project.



Before – Eroded Stream

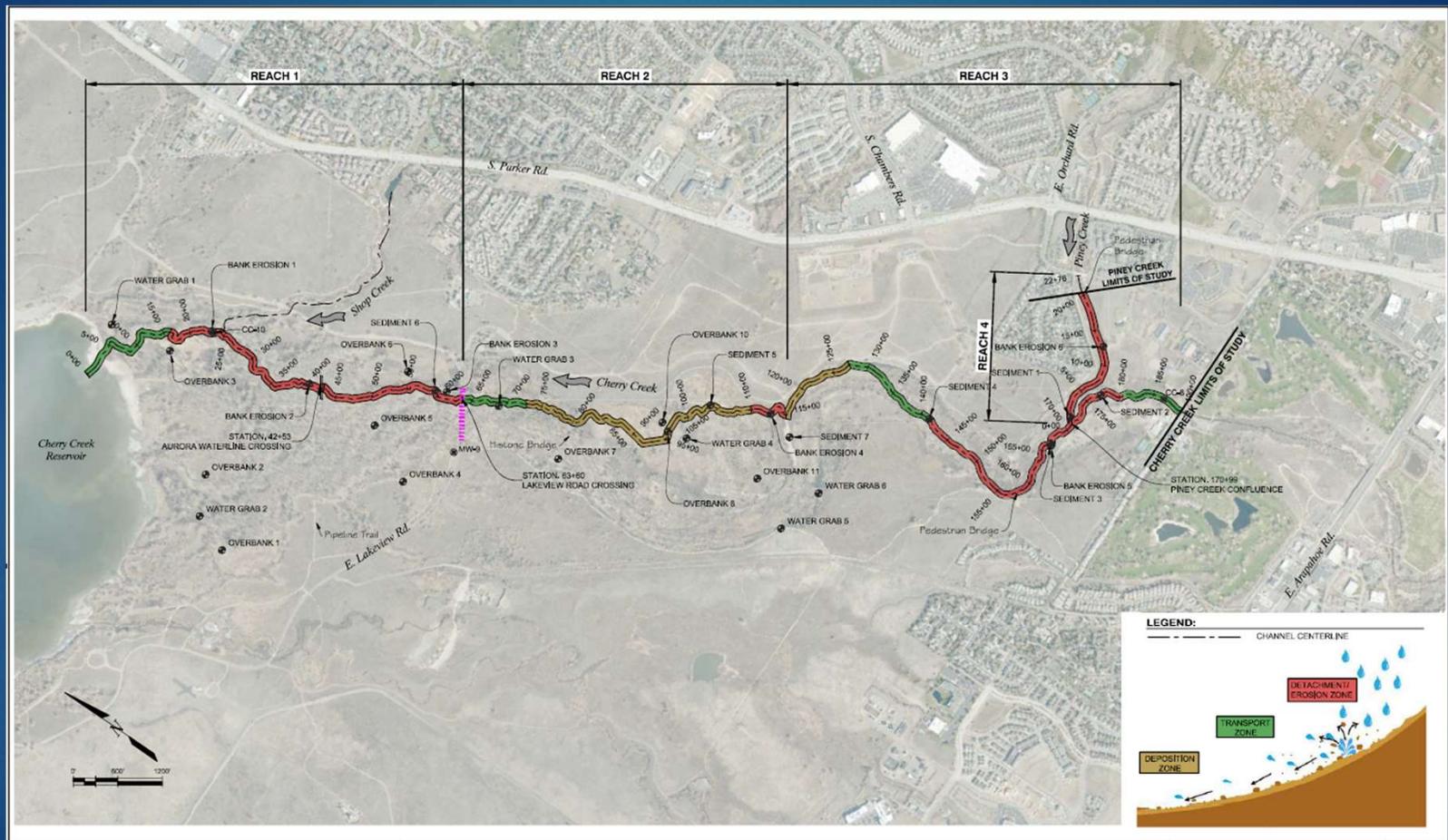


After – Stream Reclamation

Photo 3 – Example of Similarly Eroded Stream (Before), Plum Creek in Chatfield State Park

Photo 4 – Example of Reclaimed Stream (After), Plum Creek in Chatfield State Park





MULLER
ENGINEERING COMPANY
777 S. WADSWORTH BLVD., 4-100
LAKWOOD, COLORADO 80225

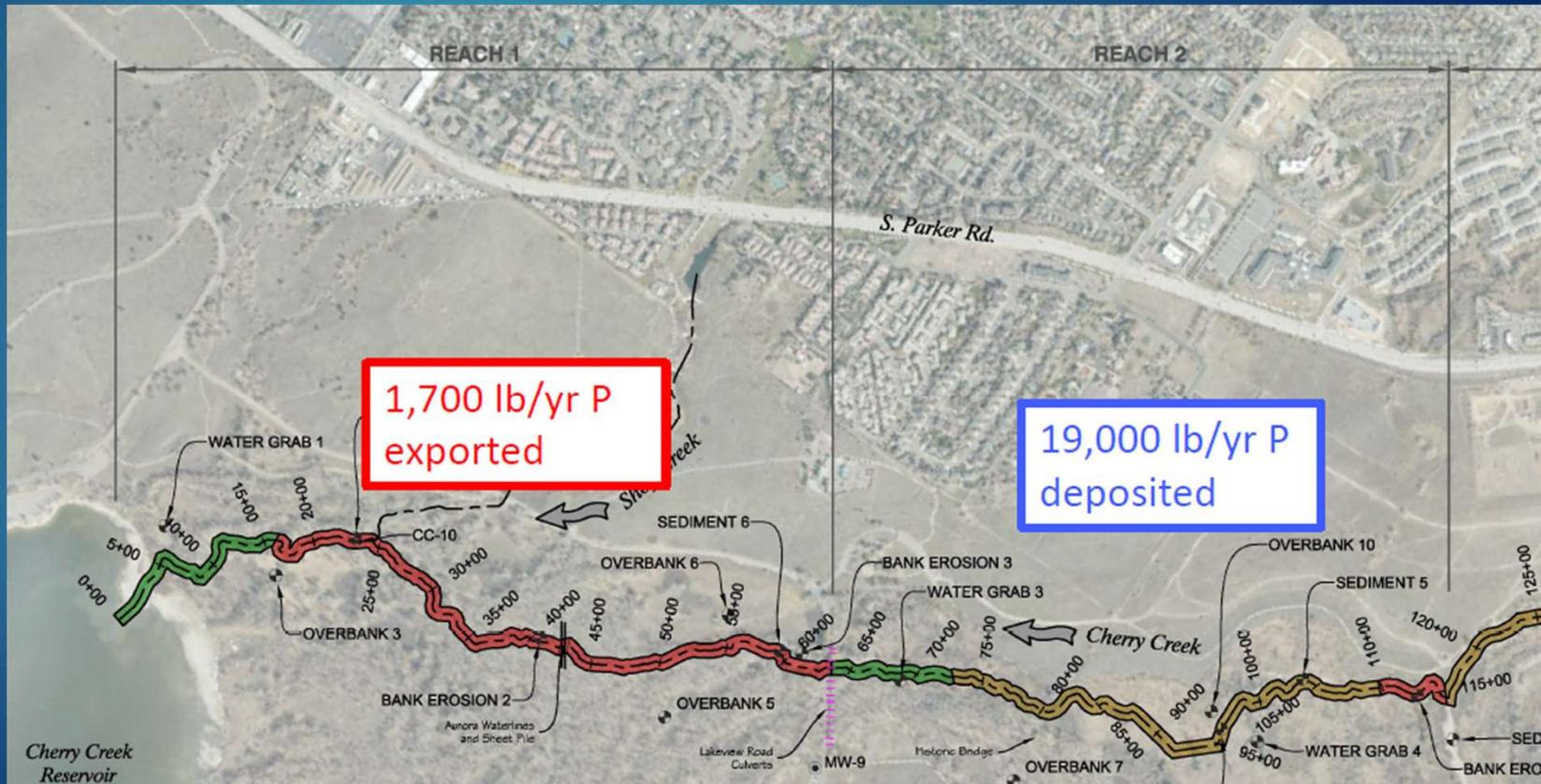
**CHERRY CREEK RESERVOIR TO 12 MILE
GEOMORPHIC SUMMARY**

FIGURE 2

DATE	5/20/2021
DRAWING NO.	
SHEET NO.	1 OF 1

Cherry Creek Reach 1, Workshop Notes

- Reach 1 is the top priority and it is severely degraded and eroding.
 - From 2013 to 2021, the average sediment loss of 2,143 tons per year and 1684 pounds of phosphorus per year directly to the Reservoir.



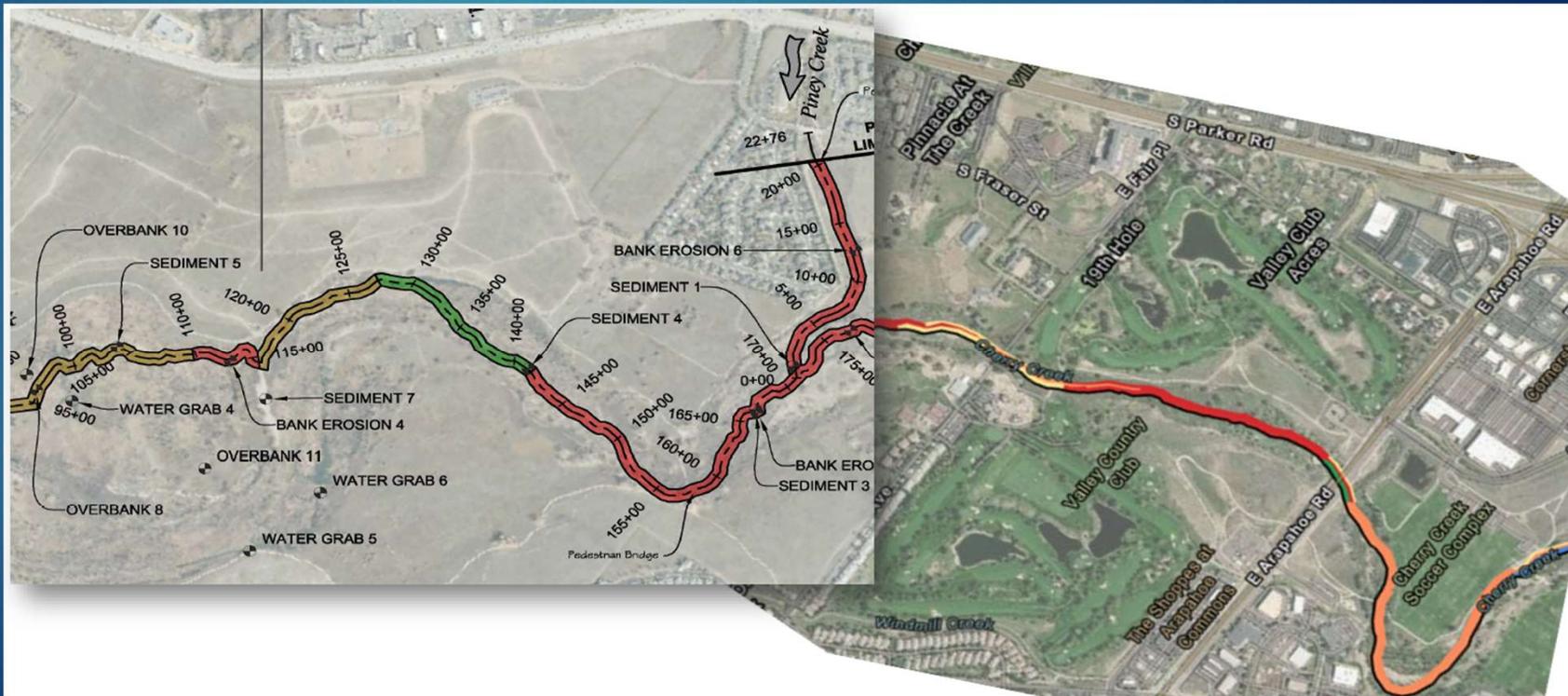
Cherry Creek Reach 2, Workshop Notes

- Reach 2 benefits the system.
 - It captures 19,000 pounds of phosphorus per year.
 - It acts as a temporary buffer by trapping sediment and reduces the near-term risk of moving forward with the downstream stream reclamation on Reach 1.
 - The sediment deposition on Reach 2 is likely not sustainable; since, more work needed on Cherry and Piney Creeks upstream for long-term success.
 - Ultimately Reaches 1, 2, and 3 work together in the system, allowing for sediment transport and exchange that achieves dynamic equilibrium.



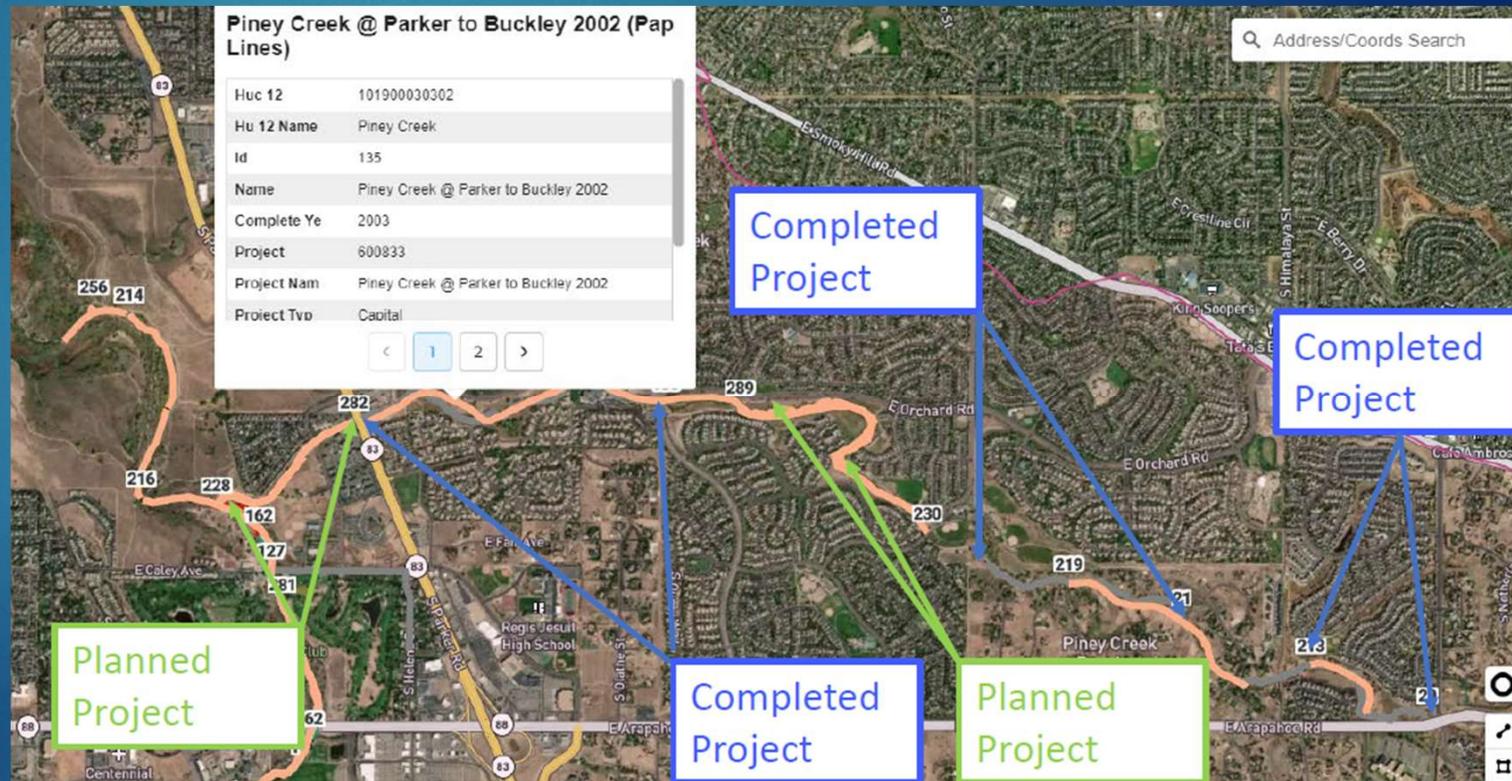
Cherry Creek Reach 3, Workshop Notes

- Cherry Creek Reach 3 is severely degraded and eroding.
- The erosion on Cherry Creek continues upstream past the Cherry Creek State Park Boundary to the Aurora Soccer fields as show in the Cherry Creek Major Drainageway Planning.
- This erosion presents a risk to the sediment trapping feature that naturally captures phosphorus in Reach 2.
- Completed stream reclamation projects upstream of the Aurora Soccer fields serve to protect the stream and minimize potential impacts from the upstream system.



Piney Creek Reach 4, Workshop Notes

- Piney Creek Reach 4 is severely degraded and eroding.
- The erosion on Piney Creek continues upstream past the Cherry Creek State Park Boundary to Parker Road.
- This erosion presents a risk to the sediment trapping feature that naturally captures phosphorus in Reach 2.
- CCBWQA and SEMSWA have a project currently underway for Piney Creek Reach 4 and the including the section upstream to Parker Road.
- Completed stream reclamation projects upstream of the Parker Road serve to protect the stream and minimize potential impacts from the upstream system.





CCBWQA 3/16/23 Workshop – Follow up

CCBWQA: TAC - APRIL 6, 2023, BOARD – APRIL 20, 2023



How does this summary look? Any other items that should be included?

Workshop Input	Follow-up	Action Item(s)
Consensus with Reach 1 being the top priority	<ul style="list-style-type: none"> <input type="checkbox"/> Muller prepared scope of work and fee for alternatives analysis and selection of preferred alternative (which includes cost estimate) 	<ul style="list-style-type: none"> <input type="checkbox"/> Take consultant agreement to TAC and Board for their action in April
Develop an approach for the entire system that reduces the risk of upstream reaches on the Reach 1 project	<ul style="list-style-type: none"> <input type="checkbox"/> R2R reviewed 10-year CIP and prepared approach that: <ul style="list-style-type: none"> o Prioritizes Reach 1 (near term) o Provides funding for monitoring and adaptive management approach for upstream reaches (longer term) 	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss and review approach with TAC and Board in April <input type="checkbox"/> Revise approach and include it in 10-year CIP for TAC and Board and action with CCBWQA's budget in October and November
Partner outreach and funding is critical to meeting the needs	<ul style="list-style-type: none"> <input type="checkbox"/> Bill, Jane, and Rich developed and coordinated with CPW the project overview and outreach handout <input type="checkbox"/> Met with CPW on their backlog projects and how to best approach CPW on these projects <input type="checkbox"/> Reach out to Aurora about support/partnership in projects to protect their waterlines <input type="checkbox"/> Reach out to CWCB for grants for these projects <input type="checkbox"/> Reach out to USACOE for support/partnership <input type="checkbox"/> Identify other stakeholders and partners 	<ul style="list-style-type: none"> <input type="checkbox"/> Prepare for TAC and Board discussion and review in April, incorporate any comments <input type="checkbox"/> Encourage CCBWQA champions to use project overview to engage their communities, stakeholders, and partners for support and funding
Current project on Piney Creek from confluence with Cherry Creek upstream to Parker Road benefits from completed projects which serve to protect the stream and minimize potential impacts from the upstream system	<ul style="list-style-type: none"> <input type="checkbox"/> Continue with project on the planned schedule 	<ul style="list-style-type: none"> <input type="checkbox"/> Bring IGA Amendment to TAC and Board for 2023 funding
??? – Any other items?		

Project Overview and Outreach

We Need Your Help to Protect Cherry Creek and the Reservoir!

Where:

Cherry Creek State Park (CCSP, see Figure 1) and Cherry Creek Reservoir serve as an oasis for the Denver metro area and Colorado Front Range. CCSP is in Arapahoe County, surrounded by Denver, Greenwood Village, Aurora, and Centennial. CCSP sees over 2 million park visitors annually that enjoy the natural resources and recreation provided by Cherry Creek and the Reservoir.

Who:

The Cherry Creek Basin Water Quality Authority (CCBWQA) and Colorado Parks and Wildlife (CPW) are working to protect the water quality in Cherry Creek and the Reservoir. For more, see <https://www.cherrycreekbasin.org/>.

Issue:

Severe erosion (see photos 1 and 2) is occurring in Cherry Creek in CCSP and in Piney Creek immediately upstream. The erosion is threatening the surrounding environment, wildlife corridors, critical infrastructure, and water quality. Additionally, downed trees could become debris in a large flood event potentially impacting the flood control purpose of the Reservoir.

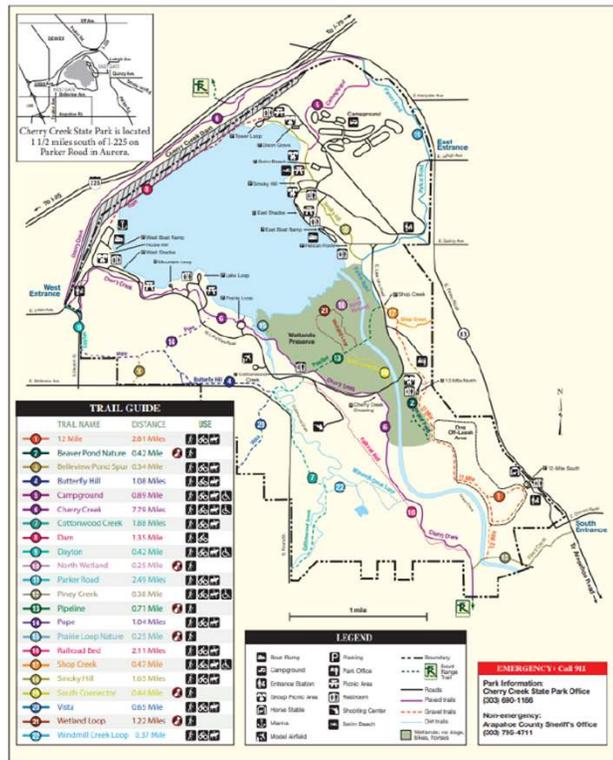


Figure 1 - Cherry Creek State Park



CCBWQA 3/16/23 Workshop – Follow up

CCBWQA: TAC - APRIL 6, 2023, BOARD – APRIL 20, 2023



Multi-pronged approach

CHERRY CREEK BASIN WATER QUALITY AUTHORITY																		
TABLE 2 - SUMMARY OF RECOMMENDED POLLUTANT REDUCTION FACILITIES																		
2023 - 2032 BUDGET PROJECTIONS (1000\$)																		
Multi-pronged Approach on Workshop Priority Reaches (Piney Creek downstream of Parker Rd. and Cherry Creek downstream of drop structure at Aurora Soccer Complex which is south of Arapahoe Road)																		
	March 29, 2023	Current Project Budget			Proposed 2023 Budget				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	2023-2032 Total
Project No.	Project Title	Total	Authority Portion	Authority Portion	Design	Capital	Water	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
CCB-5.14C	Cherry Creek Stream Reclamation - Reach 3	\$ 2,567	\$ 640	25%	\$ 130	\$ -	\$ -	\$ 130	\$ 510	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 640
CCB-5.14C	Cherry Creek Stream Reclamation - Reach 4	\$ 2,720	\$ 680	25%	\$ -	\$ 475	\$ -	\$ 475	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 475
CCB-5.16A	Cherry Creek - Reservoir to Lake View Drive Alternatives Analysis	\$ 200	\$ 200	100%	\$ 200	\$ -	\$ -	\$ 200	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 200
CCB-6.5	Piney Creek Reach 1 to 2 (SEMSWA)	\$ 2,350	\$ 515	22%	\$ 63	\$ -	\$ -	\$ 63	\$ 39	\$ 25	\$ 75	\$ 150	\$ 125	\$ -	\$ -	\$ -	\$ -	\$ 477
CCB-5.16A,B,C	Cherry and Piney Creeks in CCSP	\$22,500	\$19,500	87%	\$ -	\$ -	\$ -	\$ -	\$ 450	\$ 1,400	\$ 1,000	\$ 1,355	\$ 1,900	\$ 2,000	\$ 920	\$ 960	\$ 1,500	\$ 11,485
CCB-5.14D	Cherry Creek Stream Reclamation - Remaining Sections (not included in Reaches 3 and 4) from Valley Country Club to Soccer Fields	\$ 2,980	\$ 745	25%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 100	\$ 100	\$ 545	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 745



CCBWQA 3/16/23 Workshop – Follow up

CCBWQA: TAC - APRIL 6, 2023, BOARD – APRIL 20, 2023



Multi-pronged approach

		March 29, 2023	Current Project Budget			Proposed 2023 Budget				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	2023-2032 Total
	Project No.	Project Title	Total	Authority Portion	Authority Portion	Design	Capital	Water	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
6																			
8	CCB-5.14C	Cherry Creek Stream Reclamation - Reach 3	\$ 2,567	\$ 640	25%	\$ 130	\$ -	\$ -	\$ 130	\$ 510	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 640
9	CCB-5.14C	Cherry Creek Stream Reclamation - Reach 4	\$ 2,720	\$ 680	25%	\$ -	\$ 475	\$ -	\$ 475	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 475
10	CCB-5.16A	Cherry Creek - Reservoir to Lake View Drive Alternatives Analysis	\$ 200	\$ 200	100%	\$ 200	\$ -	\$ -	\$ 200	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 200
11	CCB-6.5	Piney Creek Reach 1 to 2 (SEMSWA)	\$ 2,350	\$ 515	22%	\$ 63	\$ -	\$ -	\$ 63	\$ 39	\$ 25	\$ 75	\$ 150	\$ 125	\$ -	\$ -	\$ -	\$ -	\$ 477
12	CCB-5.16A,B,C	Cherry and Piney Creeks in CCSP	\$22,500	\$19,500	87%	\$ -	\$ -	\$ -	\$ -	\$ 450	\$ 1,400	\$ 1,000	\$ 1,355	\$ 1,900	\$ 2,000	\$ 920	\$ 960	\$ 1,500	\$ 11,485
13	CCB-5.16A	Cherry Creek Reach 1 from Muller Stream Assessment	\$12,000	\$ 9,000	75%	\$ -	\$ -	\$ -	\$ -	\$ 315	\$ 1,400	\$ 1,000	\$ 1,355	\$ 1,900	\$ 2,000	\$ 920	\$ 110	\$ -	\$ 9,000
14	CCB-5.16B,C	Cherry Creek Reaches 2-3 from Muller Stream Assessment	\$10,500	\$10,500	100%	\$ -	\$ -	\$ -	\$ -	\$ 135	\$ -	\$ -	\$ 135	\$ -	\$ -	\$ 135	\$ 580	\$ 1,500	\$ 2,485
15	CCB-5.14D	Cherry Creek Stream Reclamation - Remaining Sections (not included in Reaches 3 and 4) from Valley Country Club to Soccer Fields	\$ 2,980	\$ 745	25%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 100	\$ 100	\$ 545	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 745



CCBWQA 3/16/23 Workshop – Follow up

CCBWQA: TAC - APRIL 6, 2023, BOARD – APRIL 20, 2023



Multi-pronged approach

16					
17	CIP Analysis and Breakdown (1000\$)				
18	\$ 11,685	Subtotal of projects in CCSP			
19	\$ 9,200	Subtotal of Reach 1			
20	\$ 4,822	Subtotal of projects upstream of Reach 1			
21	\$ 2,337	Subtotal of projects upstream of CCSP			
22	\$ 14,022	Subtotal of Workshop Priority Reaches (Piney Creek downstream of Parker Rd. and Cherry Creek downstream of drop structure at Aurora Soccer Complex which is south of Arapahoe Road)			
23	47%	% of Workshop priority reaches as of the total CCBWQA's 10-year CIP			
24	\$ 30,006	Grand Total of CCBWQA's 10-year CIP			
25					
26	Breakdown of Workshop Priority Reaches				
27	66%	% of funding for Reach 1			
28	34%	% of funding for reaches upstream of Reach 1			
29					



CCBWQA 3/16/23 Workshop – Follow up

CCBWQA: TAC - APRIL 6, 2023, BOARD – APRIL 20, 2023



Multi-pronged approach

What are your thoughts on this approach?

Memorandum

To: CCBWQA Board of Directors
From: Jessica DiToro, PE, LRE Water
Reviewed by: Jane Clary, Wright Water Engineers
Date: April 20, 2023
Subject: Lake Nutrients Criteria Rulemaking Hearing

Issue Update: At the beginning of the Lakes Nutrients Rulemaking Hearing (RMH) process in the summer of 2022, CCBWQA requested a delayed effective date of December 31, 2025 to allow time to develop site specific standards. Although the Water Quality Control Division (Division) originally opposed this request, in its [Consolidated Proposal](#) released on April 3, 2023, the Division proposed a major change in direction for standards adoption that would result in TP and TN standards only being adopted in high priority lakes located upstream of qualified dischargers (i.e., domestic wastewater treatment facilities). The Consolidated Proposal specifically stated that the Division was no longer proposing for TN or TP standards adoption in Cherry Creek Reservoir at the April 2023 RMH. This change has effectively addressed CCBWQA’s request.¹ The Division’s redlines to Regulation 38 regarding Cherry Creek Reservoir are presented below:

“a. Control Regulations

The commission may also consider revised site-specific nutrients standards for the following lake and reservoir segments that have existing nutrient control regulations in future rulemaking hearings if information to support appropriate and protective revisions is developed:

Upper South Platte River: 6b (COSPUS06b; Chatfield Reservoir)

Cherry Creek: 2 (COSPCH02; Cherry Creek Reservoir)

The commission did not adopt total nitrogen or total phosphorus table value standards for either waterbody in this rulemaking hearing. (Pages 607-608/731 of the Division’s Consolidated Proposal)

¹ While there is no specifically stated delayed effective date included in the stream segment table for Cherry Creek Reservoir, the Division has added language to the statement of basis and purpose which states that the TP and TN standards will be adopted in all applicable lakes and reservoirs at a RMH in 2027.

2. Cherry Creek Reservoir.		Physical and Biological		Metals (ug/L)		
COSPOCH02	Classifications	DM	MWAT	acute	chronic	
Designation	Agriculture					
Reviewable	Aq Life Warm 1	WL	WL	Arsenic	340	
	Recreation E	acute	chronic	Arsenic(T)	---	
	Water Supply			Cadmium	TVS	
Qualifiers:	Public Swim Beach*	D.O. (mg/L)	5.0	Cadmium(T)	TVS	
Other: Temporary Modification(s): Arsenic(chronic) = hybrid Expiration Date of 12/31/2024 *chlorophyll a (ug/L)(chronic) = Season mean concentration measured in the upper three meters of the water column for the months of July through September with an exceedance frequency of once in five years. *Public Swim Beach applies to Cherry Creek Reservoir. *Uranium(acute) = See 38.5(3) for details. *Uranium(chronic) = See 38.5(3) for details.		pH	6.5 - 9.0	Chromium III	---	
		chlorophyll a (ug/L)	7/1 - 9/30	18*	Chromium III(T)	TVS
		E. coli (per 100 mL)	---	126	Chromium VI	TVS
		Inorganic (mg/L)		TVS	TVS	
			acute	chronic	Copper	TVS
		Ammonia	TVS	TVS	Iron	---
		Boron	---	0.75	Iron(T)	---
		Chloride	---	250	Lead	TVS
		Chlorine	0.019	0.011	Lead(T)	50
		Cyanide	0.005	---	Manganese	TVS
		Nitrate	10	---	Mercury(T)	---
		Nitrite	---	0.5	Molybdenum(T)	---
		Nitrogen	---	TVS	Nickel	TVS
		Phosphorus	---	TVS	Nickel(T)	---
		Sulfate	---	WS	Selenium	TVS
	Sulfide	---	0.002	Silver	TVS	
				Uranium	varies*	
				Zinc	TVS	

Table 1. Cherry Creek Reservoir Stream Segment Table in Regulation 38 (Page 633 of 731 of Division’s Consolidated Proposal)

The Lakes Nutrients RMH was held on April 10-12, 2023 in a hybrid format. Jane Clary testified in person on the CCBWQA’s behalf on the morning of April 11, 2023 with support from Erin Stewart and Andrea Bronson virtually. After more than two days of oral testimony, the Water Quality Control Commission moved to adopt the Division’s Consolidated Proposal, meaning TP and TN standards were not adopted for Cherry Creek Reservoir.

Next Steps: Work with Hydros to develop site-specific nutrient standards for Cherry Creek Reservoir so that a proposal will be ripe for the 2027 RMH. Additional discussions with Hydros and the TAC may be warranted regarding timing of the reservoir model update relative to development of a site-specific standards proposal, given that additional time is available (2027 rulemaking instead of 2025).



To: CCBWQA Board of Directors
From: Jessica DiToro, PE, LRE Water and Jane Clary, Wright Water Engineers
Date: April 20, 2023 (REVISED)
Subject: Control Regulation 72 Informational Hearing

CCBWQA participated in the CR 72 Informational Hearing that was held on April 10, 2023. As part of this Informational Hearing, CCBWQA provided a letter to the Water Quality Control Commission (WQCC) on January 23, 2023. The other parties that submitted letters and provided oral comments to the WQCC were: 1) Water Quality Control Division (WQCD), and 2) PWSD and Castle Rock, who submitted a joint letter. The comments are summarized below and can be reviewed on the [WQCC's Google Drive](#):

- **WQCD:** The WQCD is not proposing a CR 72 RMH at this time. The WQCD is aware of PWSD and Castle Rock's proposal, but at this time the WQCD has no current position on their proposal but "would be ok" with a limited scope RMH.
- **PWSD and Castle Rock:** PWSD and Castle Rock requested that the WQCC set a limited scope RMH for CR 72 to review the construction dewatering discharge limit for TP of 0.05 mg/L. PWSD and Castle Rock are proposing to add the *following language* to CR 72.4:

4. No industrial process wastewater source or wastewater facility within the Cherry Creek watershed shall discharge an effluent with a total phosphorus concentration greater than 0.05 mg/l total phosphorus as a 30-day average except that, at the request of a permittee, the Division is authorized to allow up to a 90-day averaging period for this limit in the discharge permit or in the notice of authorization issued pursuant to Commission Regulation #84. . . .

a. Consistent with Regulation 85.5(3)(b)(iii), the numerical effluent limitations set forth in section 72.4 shall not apply where discharges consist solely of ground water that is pumped for the purpose of dewatering a construction site or for building sumps so long as no phosphorus or nitrogen is added to the ground water being discharged.

- **CCBWQA:** Jane Clary represented CCBWQA and stated that CCBWQA does not intend to be a proponent to a CR 72 RMH, but if a RMH is scheduled, that CCBWQA will participate as a party to the RMH. Ms. Clary also stated that the CCBWQA Board has not yet taken a position on PWSD and Castle Rock's proposal.

The WQCC granted PWSD and Castle Rock's request to set a limited scope RMH for the issue as discussed. The RMH will be scheduled in early 2024, with the exact date to be determined. The stakeholder process is expected to begin in May of 2023.

CHERRY CREEK BASIN WATER QUALITY AUTHORITY
2023 Capital Project Status Report
April 13, 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.

STREAM RECLAMATION PROJECTS

1. Cherry Creek Stream Reclamation at Arapahoe Road aka Reaches 3 and 4 (CCB-5.14C)
 - a. Description: This project continues the work on Cherry Creek by CCBWQA, MHFD, and local partners. It ties into the previous stream reclamation projects of Cherry Creek Eco Park to Soccer Fields (CCB-5.14A) and Cherry Creek at Valley Country Club (CCB-5.14B). The 5,167 Linear Feet of stream reclamation reduces bed and bank erosion immobilizing approximately 88 pounds of phosphorus annually. The project is anticipated to be funded over several years and likely be broken into phases.
 - b. Status: In 2021, an IGA was executed between CCBWQA, MHFD, City of Aurora, and SEMSWA to begin this work. IGA Amendment that brings in 2022 funding is under review (5/13/22). Board authorized IGA Amendment for 2022 funding on 7/21/22 (8/12/22). IGA Amendment has been revised to show Aurora's lower participation; CCBWQA's participation was lowered accordingly to meet 25% partner project level; revised IGA Amendment received TAC recommendation and is being taken to Board for their consideration in October (10/13/22). Board authorized the IGA Amendment for 2022 funding at their 10/22/22 meeting. It appears that CCBWQA's 2023 participation will be reduced as a result of less partner funding available for this project (2/24/23).
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).

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.
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).

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 is scheduled for the TAC and Board for April (3/30/23).
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 completions (4/13/23).*

8. Dove Creek - Otero to Chambers Rd. (CCB-23.1)
 - a. Description: The design and construction are in partnership with Southeast Metro Stormwater Authority (SEMSWA) and with Mile High Flood District (MHFD) being a key stakeholder; it includes 1,300 feet of stream reclamation. The Authority's water quality component share for design and construction is estimated to be \$175,000. The total project cost is estimated at \$700,000.
 - b. Status: SEMSWA is drafting the Intergovernmental Agreement to bring in the 2021 funding for the project (3/12/21). RESPEC is the design consultant; two conceptual design alternatives have been prepared and reviewed during meeting on 3/15/21. IGA is scheduled for CCBWQA's May TAC and Board meetings (4/30/21). IGA has been approved and executed by all parties (7/29/21). 30% Design Review Meeting was held on 8/23/21. A Progress meeting is scheduled for 2/26/22 with 60% Plan submittal expected to follow (1/28/22). The 60% Design was submitted on 2/16/2022, comments were provided, and a design review meeting was held on 2/23/2022. IGA Amendment to bring in 2022 funding is in process (3/10/22). Construction costs were prepared by CEI based on 60% submittal (5/13/22). A design progress meeting was held 6/14/22 and 90% design submittal is being prepared (6/30/22). 90% design submittal is expected by the end of July (7/15/22). The 90% design submittal was reviewed, and comments were submitted on 8/22/22. *Construction is anticipated in 2023 (10/13/22)*. A progress meeting was held on 11/8/22, project will likely be done in 2 phases, IGA Amendment will be needed early in 2023 so that construction can start ahead of storm season. Dove Creek IGA for construction of Phase 1 is scheduled for TAC and Board in January 2023, construction is expected to start shortly afterwards (12/30/22). Construction is scheduled to start mid-February; construction agreement and engineering construction services amendment are currently being reviewed (1/27/23). 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)*.
9. Piney Creek from Fraser Street to Confluence with Cherry Creek aka Reaches 1 and 2 (CCB-21.1)
 - a. Description: This project includes 2900 liner feet of stream reclamation on Piney Creek. The project partners are SEMSWA and CCBWQA.
 - b. Status: Project coordination meeting was held with SEMSWA on 6/29/22. IGA drafted and is being reviewed by SEMSWA (8/12/22). IGA was approved by CCBWQA at the 9/15/22 Board meeting.
10. Mountain and Lake Loop Shoreline Stabilization Phase II (OM 4.6)
 - a. Description: This project was identified in through the 2020 annual inspection and design and permitting started in 2021. It adds about 40 feet of shoreline protection where it has eroded leaving a 1-2 foot tall vertical bank.
 - b. Status: Construction Plans have been prepared and the GESC was submitted to Arapahoe County for review (1/13/22). Plans are being reviewed by US Army Corps of Engineers for 408 clearance (5/13/22).
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).