

CHERRY CREEK BASIN WATER QUALITY
AUTHORITY

***2019 CAPITAL IMPROVEMENT PROGRAM
SUPPORTING DATA***

TAC Draft – September 11, 2018

TAC Recommendation – October 4, 2018

Board Review Version – October 18, 2018

Board Adopted Version – November 15, 2018

2019 CAPITAL IMPROVEMENT PROGRAM

This document presents the details of the 2019 Capital Improvement Program as adopted by the Authority Board and includes the following information:

Table 1 – Summary of Potential Pollutant Reduction Facilities, Revision for 2019 CIP.

This table lists all the PRF projects that have been considered for implementation by the Authority since 2000 and shows their current status. The “green” font represents projects in progress and the “blue” font represents completed projects.

Prior to 2010, Cherry Creek Reservoir was under a total maximum annual load (TMAL) limitation for phosphorus. Since PRFs originally focused on reduction of phosphorus loads discharged into the reservoir, the table was developed to provide a brief summary of the design basis, projected loads and treatment, and estimated PRF costs and costs per pound of phosphorus immobilized. Currently there is no TMAL; instead the control strategy identified in Regulation No. 72 is to minimize nutrient (phosphorus and nitrogen) concentrations. Therefore, PRFs are still evaluated, in part, on their costs per pound for consistency between all potential PRFs (see also Stream Reclamation Unit Costs below). Additional information on how PRFs are evaluated, particularly stream reclamation type projects, is presented in the Authority’s report dated June 17, 2011 titled *Stream Reclamation Water Quality Benefit Evaluation Interim Status Report*.

Table 2 – Summary of Recommended Pollutant Reduction Facilities 2019 – 2028 Budget Projections

This table lists the PRFs that are in the current, 10-year CIP projection with more detail provided for the projects in the current budget year. Since the Authority partners with other governmental agencies to design and construct some of the PRFs, the Authority’s portion of total project costs is also shown. The column labeled “obligated funds” represents the total amount approved by the Authority for the project prior to the budget year, since most projects take several years from concept through construction. Funds are considered “obligated” once the Board approves funding at a regular Board meeting.

2019 – 2028 CIP Notes

This document serves as the “footnotes” to Table 2 and provides more budgetary detail for the specific projects listed in Table 2, such as updates to cost estimates, project phasing, and general background information.

2019 Budget Detail

These tables provide further 2019 budget detail for operations and maintenance activities proposed for the constructed PRF's including the Reservoir Mixing System (i.e.: compressor and aeration system maintenance).

Stream Reclamation Unit Costs

This exhibit shows the stream reclamation unit costs trend with project length for completed and planned Authority sponsored projects.

Operations and Maintenance Projects

This table shows the cumulative list and identification number for O&M projects.

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CHERRY CREEK BASIN WATER QUALITY AUTHORITY
TABLE 1 - SUMMARY OF POTENTIAL POLLUTANT REDUCTION FACILITIES
REVISIONS FOR 2018 CIP

Date: **August 20, 2018**

Color Code: **Blue** Project Completed

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

See: "2018 CIP Notes" for changes to this Spreadsheet

Proj. Designation	Project Title	Status	Description	Design Basis				Projected Loads			Projected Treatment			Cost Estimate (1000\$)							Unit Cost (\$/pound)		Note			
				PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)	w/o cost sharing		w/cost sharing		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)			
CCR-1	Reservoir Destratification (mixing)	Officially start-up April 2008	Use inlake mixing to minimize algae blooms, therefore chlorophyll a	369	sq mi	n/a	n/a	n/a	n/a	n/a		810	lbs/season	\$ 968				28	\$ 80	100%	\$968	\$ 99	\$ 99			
CCB-1	CCSP Wetlands	Prelim design prepared in 2003 (Ref 1, 8)	Restore 60 Acres of wetlands in multiple phases	369	sq mi	3.5 cfs avg daily flow	1415 af/210 days	0.35	mg/l	1050	lbs/yr	Base flow		600	lbs/season	\$ 1,928	\$ -	\$ -	\$ -	19	\$ 123	100%	\$1,928	\$ 204	\$ 204	18
CCB-5.1	Cherry Creek Sediment Pond at Arapahoe Road (see CCB-5.14)	Project eliminated and area combined into Phase III of CCB-5.14	Design and construct sediment pond	369	sq mi		3600 cy sed/yr	14.6	mg/l	92	lbs/yr	base flow		85	lbs/year	\$ 2,355	\$ 50	\$ -	\$ -	\$ 90	\$ 219	18%	\$424	\$ 2,575	\$ 463	1, 19
CCB-5.2	Arapahoe/Douglas County Line Stream Stabilization	Project completed w/o Authority participation	Local stream stabilization (L = 2700 ft)	0.51	mi			100	lbs/mi	51	lbs/yr	Storm Flow	90%	46	lbs/year	\$ 1,062	\$ -	\$ -	\$ -	1	\$ 58	0%	\$0	\$ 1,258	\$ -	
CCB-5.3	Cottonwood Bridge Stream Stabilization	Project completed by Parker w/o Authority participation	Local stream stabilization (L = 2700 ft)	0.51	mi			100	lbs/mi	51	lbs/yr	Storm Flow	90%	46	lbs/year	\$ 436	\$ -	\$ -	\$ -	2	\$ 25	0%	\$0	\$ 551	\$ -	
CCB-5.4	Cherry Creek Stream Stabilization at Main Street (Parker)	Conceptual design by UDFCD identified priority 1	Local stream stabilization (L = 4000 ft)	0.76	mi			100	lbs/mi	76	lbs/yr	Storm Flow	90%	68	lbs/year	\$ 1,776	\$ -	\$ -	\$ -	1	\$ 96	11%	\$200	\$ 1,410	\$ 159	2
CCB-5.5	Stroh Road Stream Stabilization	Project completed by Parker w/o Authority participation	Stream stabilization (L = 5000 ft)	0.95	mi			100	lbs/mi	95	lbs/yr	Storm Flow	90%	85	lbs/year	\$ 218	\$ -	\$ -	\$ -	1	\$ 13	0%	\$0	\$ 149	\$ -	
CCB-5.6	Cherry Creek Stream Stabilization at Lincoln Avenue (Parker)	Conceptual design by UDFCD identified priority 3	Local stream stabilization (L = 2350 ft)	0.45	mi			100	lbs/mi	45	lbs/yr	Storm Flow	90%	40	lbs/year	\$ 1,447	\$ -	\$ -	\$ -	1	\$ 79	21%	\$304	\$ 1,960	\$ 412	2
CCB-5.7	Cherry Creek Stream Stabilization at Eco-Park (SEMSWA)	IGA w/SEMSWA for design in 2010 and construction in 2011/2012	Local stream stabilization (L = 6850 ft)	1.30	mi			100	lbs/mi	130	lbs/yr	Storm Flow	90%	117	lbs/year	\$ 4,756	\$ -	\$ -	\$ -	1	\$ 256	24%	\$1,155	\$ 2,191	\$ 532	2
CCB-5.8	Cherry Creek Stream Reclamation U/S Arapahoe Rd (Aurora) (see CCB-5.14)	Now Phase 5 of CCB-5.14	Local stream stabilization (L = 2200 ft)	0.42	mi			100	lbs/mi	42	lbs/yr	Storm Flow	90%	38	lbs/year	\$ -	\$ -	\$ -	\$ -	1	\$ 1	35%	\$0	\$ 27	\$ 9	2
CCB-5.9.1	Cherry Creek Stream Stabilization at 12-Mile Park (CCSP) - Phase I	Design completed in 2011 for Phase I.	Local stream stabilization (L = 500 ft)	0.09	mi			100	lbs/mi	9	lbs/yr	Storm Flow	90%	9	lbs/year	\$ 296	\$ -	\$ -	\$ -	1	\$ 17	100%	\$296	\$ 1,979	\$ 1,979	2, 20
CCB-5.9.2	Cherry Creek Stream Stabilization at 12-Mile Park (CCSP) - Phase II	Design completed in 2013 for Phase II.	Local stream stabilization (L = 2500 ft)	0.47	mi			100	lbs/mi	47	lbs/yr	Storm Flow	90%	43	lbs/year	\$ 1,429	\$ -	\$ -	\$ -	1	\$ 78	100%	\$1,429	\$ 1,820	\$ 1,820	2, 20
CCB-5.10	Cherry Creek Stream Stabilization at PJCOS (Vermillion Creek, PJMD.)	Design completed by PJMD. Authority is funding partner in design	Local stream stabilization (L = 5100 ft)	0.97	mi			100	lbs/mi	97	lbs/yr	Storm Flow	90%	87	lbs/year	\$ 3,017	\$ -	\$ -	\$ -	2	\$ 164	21%	\$643	\$ 1,882	\$ 401	
CCB-5.11	Cherry Creek Stream Stabilization at Norton Farms (Parker)	Conceptual design by UDFCD identified priority 3	Local stream stabilization (L = 2200 ft)	0.42	mi			100	lbs/mi	42	lbs/yr	Storm Flow	90%	38	lbs/year	\$ 900	\$ -	\$ -	\$ -	1	\$ 49	28%	\$252	\$ 1,313	\$ 368	2
CCB-5.12	Cherry Creek Stream Stabilization at Pine Lane	Project completed by Parker w/o Authority participation	Local stream stabilization (L = 1500 ft)	0.28	mi			100	lbs/mi	28	lbs/yr	Storm Flow	90%	26	lbs/year	\$ 500	\$ -	\$ -	\$ -	1	\$ 28		\$0	\$ 1,087	\$ -	
CCB-5.13	Cherry Creek Stream Stabilization at Shop Creek Trail	Preliminary design completed in 2010 (Ref 12).	Local Stream Stabilization (L = 2000 ft)	0.38	mi			100	lbs/mi	38	lbs/yr	Storm Flow	90%	34	lbs/year	\$ 728	\$ -	\$ -	\$ -	1	\$ 40	100%	\$728	\$ 1,174	\$ 1,174	
CCB-5.14	Cherry Creek Stream Reclamation - CCSP to Eco Park (Ph II to V)	IGA w/SEMSWA for design in 2010	Local stream stabilization (L = 11000 ft)	2.08	mi			100	lbs/mi	208	lbs/yr	Storm Flow	90%	188	lbs/year	\$ 10,200	\$ -	\$ -	\$ -	1	\$ 547	25%	\$2,499	\$ 2,920	\$ 715	
CCB-5.15	Cherry Creek Stream Reclamation at Country Meadows (Hess Rd)	New project by Town of Parker and Douglas County	Local stream stabilization (L = 7700 ft)	1.46	mi			100	lbs/mi	146	lbs/yr	Storm Flow	90%	131	lbs/year	\$ 2,170	\$ -	\$ -	\$ -	2	\$ 118	24%	\$520	\$ 901	\$ 216	
CCB-5.16	Cherry Creek Stream Reclamation - D/S Piney Creek	Project w/in CCSP identified as Reach 1 in Project CCB-5.14 work.	Local stream stabilization (L = 1500 ft)	0.28	mi			100	lbs/mi	28	lbs/yr	Storm Flow	90%	26	lbs/year	\$ 1,500	\$ -	\$ -	\$ -	1	\$ 81	100%	\$1,500	\$ 3,182	\$ 3,182	
CCB-5.17	Cherry Creek Stream Reclamation U/S Scott Road	Conceptual design by Parker	Local stream stabilization (L = 4800 ft)	0.91	mi			100	lbs/mi	91	lbs/yr	Storm Flow	90%	82	lbs/year	\$ 650	\$ -	\$ -	\$ -	1	\$ 36	25%	\$163	\$ 437	\$ 109	
CCB-6.1	Piney Creek Stream Stabilization - Project 1	Authority funded \$118,000 Arapahoe County in 2002.	Restore 5200 lf upstream of Parker Road	22.90	sq mi	n/a	n/a	100	lbs/mi	100	lbs/yr	Storm Flow	90%	90	lbs/year	\$ 997	\$ -	\$ -	\$ -	10	\$ 64	13%	\$130	\$ 709	\$ 92	
CCB-6.2	Piney Creek Stream Stabilization - Project 2 U/S Buckley Rd	Project completed w/o Authority participation	Reclaim 1700 lf upstream of Buckley Road	0.32	mi			100	lbs/mi	32	lbs/mi	Storm Flow	90%	29	lbs/year	\$ 998	\$ -	\$ -	\$ -	1	\$ 54	12%	\$120	\$ 1,880	\$ 226	
CCB-6.3	Piney Creek Stream Sediment Removal - Saddle Rock Golf Course	Request from Aurora in 2011	Sediment removal to restore channel capacity (L = unk)					unk	unk	unk	Sediment	100%	5346	unk	\$ 383	\$ -	\$ -	\$ -	10	\$ 30	25%	\$96	\$ 6	\$ 1		
CCB-6.4	Piney Creek Stream Reclamation - Reachs 6 & 7	Request from UDFCD in 2014	Local stream stabilization (L = 6,000 ft)	1.14	mi			unk	365	lbs/yr	Storm Flow	90%	329	lbs/year	\$ 11,000	\$ -	\$ -	\$ -	2	\$ 591	25%	\$2,750	\$ 1,800	\$ 450	12	
CCB-7.1	McMurdo Gulch Reclamation (Castle Rock)	Project completed in 2011	Stream Reclamation (L = 15,000 lf)	2.84				100	lbs/mi	284	lbs/yr	Storm Flow	90%	256	lbs/year	\$ 1,470	\$ -	\$ -	\$ -	28	\$ 107	43%	\$630	\$ 419	\$ 180	
CCB-8	Limestone Filter Enhancement	Specific project not identified	Construct limestone filter bed downstream of retention pond	1.0	sq mi	n/a	10.7 af/year/sq mile	427	lbs/sq mi	427	lbs/yr	Base and storm flow	20%	85	lbs/year/mi ²	\$ 943		\$ 595	\$ 1	\$ 83	43%	\$405	\$ 977	\$ 420		
CCB-11	Advanced Water Treatment Plant	Conceptual design prepared	Construct 2 MGD AWT plant on Cottonwood Creek to treat Cherry Creek and Cottonwood Creek flows (0.21-mg/ influent, 0.03 mg/l disch)	3	cfs	2-MGD	2260	0.21	mg/l	1272	lbs/yr	Base flow and groundwater	90%	1145	lbs/year	\$ 4,593	unknown	unknown		\$ 69		100%	\$4,593	\$ -	\$ -	11
CCB-12	Bowtie Property PRF	Purchase completed 2003	Stabilize confluence (Ph I) and construct sediment pond (Ph 2)	22	sq mi	2-year flood	300 af	500	mg/l/ton	85	lbs/yr	base flow and minor flood	70% pond 65% wetlands	235	lbs/year	\$ 826	\$ 300	\$ 63	\$ 1.8	\$ 6	\$ 70	100%	\$826	\$ 299	\$ 299	2
CCB-12.1	Bowtie Phase I	No action to date	Constructed Wetlands u/s Bowtie Property in Cherry Creek (0.20-disch)	369	sq mi	0.5 cfs avg daily flow	210 af/210 days	0.35	mg/l	86	lbs/yr	Base flow	assumed effluent conc	86	lbs/season	\$ 235	\$ 200	\$ 80	\$ -	\$ 7	\$ 35	100%	\$235	\$ 404	\$ 404	
CCB-13.1	Cottonwood/Peoria Wetlands Pond	Completed 2003. Restorative maintenance required in 2009	Joint funded project with UDFCD, GWV, Arapahoe County	8.30	sq mi							base and flood flows	measured	363	lbs/year	\$ 1,636	\$ -	\$ -	\$ -	5	\$ 93	12%	\$196	\$ 255	\$ 31	2

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REVISIONS FOR 2018 CIP

Date: **August 20, 2018**

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Proj. Designation	Project Title	Status	Description	Design Basis				Projected Loads			Projected Treatment		Cost Estimate (1000\$)								Unit Cost (\$/pound)		Note				
				PRF Type	Quantity	Unit	Rate	Volume	Rate	Total	Source	Removal	lbs Removed	Capital	Land Acquisition	Water Augment ⁸	Capital Replace ⁹	O&M	Annual Cost @ 4%	CCBWQA Share (%)	CCBWQA Share (\$)	w/o cost sharing		w/cost sharing			
CCB-13.2	Cottonwood Stream Reclamation in CCSF	Phase I completed in 2004. Phase II completed June 2008 (Ref 2)	11,600 lf of stream reclamation from Peoria to Perimeter Rd. Pond	2.20	mi			100	lbs/mi	220	lbs/yr	base and flood flows	see separate calcs	730	lbs/year	\$ 2,200	\$ -	\$ -	\$ -	\$ 55	\$ 173	100%	\$2,200	\$ 237	\$ 237	2	
CCB-13.3	Cottonwood Creek Stream Stabilization at Easter Avenue	Authority contributed \$338,000 for construction in 2010.	2,600 lf of stream reclamation from Easter Ave to Briarwood Ave	0.49	mi			100	lbs/mi	49	lbs/yr	Storm Flow	90%	44	lbs/year	\$ 1,350	\$ -	\$ -	\$ -	\$ 1	\$ 73	25%	\$338	\$ 1,655	\$ 414	2	
CCB-13.4	Peoria Trib B/Airport East and West Pond (Outfall C-1)	Cottonwood Creek Master Planned Improvements. Ponds combined into one.	Combined existing detention ponds and provided EURV	0.35	sq mi			400	lbs/sq mi	140	lbs/yr	Base and storm flow	40%	56	lbs/yr	\$ 523	\$ -	\$ -	\$ -	\$ -	\$ 28	25%	\$131	\$ 500	\$ 125		
CCB-14	Bellevue Wetlands	Co-funding opportunity with USACE on indefinite hold	Retrofit existing develop. w/wet detention pond	235	Ac SF Resid			400	lbs/sq mi	145	lbs/yr	Base and storm flow	50%	73	lbs/year	\$ 210	\$ -	\$ -	\$ -	\$ 2	\$ 13	100%	\$210	\$ 183	\$ 183	2	
CCB-15	Surface Water Reuse at Cherry Creek Vista	Supplemental water not available. Project on indefinite hold.	Use water from Cottonwood Creek to irrigate 10-acres			2.92 af/ac-yr	29.2 af/yr	0.20	mg/l	15.9	lbs/yr	base flow	80%	13	lbs/year	\$ 50	\$ -	\$ -	\$ -	\$ -	\$ 3	100%	\$50	\$ 211	\$ 211		
CCB-16	Stream Corridor Preservation	No projects identified in 2012	Partner with others to purchase property or conservation easements along Cherry Creek													\$ 100					\$ 5	100%	\$100			1	
CCB-17.2	Reservoir Shoreline Stabilization Mountain Loop Trail	Scheduled for construction beginning in 2012	CCSP Recreation sites: Mountain, Lake and Cottonwood Creek Loops											54	lbs/yr	\$ 1,131	\$ -	\$ -	\$ -	\$ 5	\$ 66	100%	\$1,131	\$ 1,215	\$ 1,215	1, 16	
CCB-17.3	West Boat Ramp Parking Lot WQ Improvements	Final design completed in 2012	Provide water quality treatment of parking lot runoff.	3.43	ac prkg lot					3	lbs/yr	parking lot	70%	2.1	lbs/yr	\$ 330	\$ -	\$ -	\$ -	\$ 1	\$ 19	100%	\$330	\$ 8,903	\$ 8,903	1	
CCB-17.4	East Boat Ramp Shoreline Stabilization Phase II	Identified during 2011 annual PRF inspection	400 lf of bank stabilization	400	lf	1 lb/27 lf/yr		0.04	lbs/lf	14.8	lbs/yr	bank erosion	80%	11.9	lbs/yr	\$ 90	\$ -	\$ -	\$ -	\$ 2	\$ 7	100%	\$90	\$ 576	\$ 576		
CCB-17.5	East Shade Shelter Shoreline Stabilization Phase II	Identified during 2011 annual PRF inspection	75 lf of bank stabilization	75	lf	1 lb/27 lf/yr		0.04	lbs/lf	2.8	lbs/yr	bank erosion	80%	2.2	lbs/yr	\$ 50	\$ -	\$ -	\$ -	\$ -	\$ 3	100%	\$50	\$ 1,205	\$ 1,205		
CCB-17.6	West Shade Shelter Shoreline Stabilization PRF ¹⁴	Identified initially in 2006. UCD Student Project w/WPR in 2013	1,000 lf of bank stabilization	1000	lf	0.1 cy/yr/ft		0.14	lbs/lf	140.0	lbs/yr	bank erosion	90%	126	lbs/yr	\$ 662	\$ -	\$ -	\$ -	\$ 1,000	\$ 51	100%	\$662	\$ 410	\$ 410		
CCB-17.7	Tower Loop Shoreline Stabilization Phase II	Identified during 2014 annual PRF inspection	120 lf of bank stabilization	120	lf	1 lb/27 lf/yr		0.04	lbs/lf	4.4	lbs/yr	bank erosion	80%	3.6	lbs/yr	\$ 70	\$ -	\$ -	\$ -	\$ -	\$ 4	100%	\$70	\$ 1,055	\$ 1,055		
CCB-18	OWTS Sewer Service	No action to date	Provide Sewer Service for OWTS Areas																			100%				To Be Determined	1
CCB-19	Non-point Pollutant Management	No action to date	Assist agricultural contributors to water quality impact													\$ 100	\$ -	\$ -	\$ -	\$ -	\$ 5	100%	\$100			To Be Determined	1
CCB-20.1	Detention Pond Retrofit Program - McMurdo Gulch	Phase 1 - McMurdo Gulch	Modify existing ponds to meet current standards for WQ	1	Each			0.40	lbs/Trib Acre	0.4	lbs/yr	Residential		9	lbs/pond/yr	\$ 60	\$ -	\$ -	\$ -	\$ 0	\$ 4	100%	\$60	\$ 396	\$ 396	1, 17	
CCB-21	Lone Tree Creek in CCSF	Identified in 2014. Request from Arapahoe County Open Space.	3,600 lf of stream reclamation from CCSF Boundary to Cottonwood Creek	0.68	mi			100	lbs/mi	68	lbs/yr	Storm Flow	90%	61	lbs/yr	\$ 800	\$ -	\$ -	\$ -	\$ 20	\$ 63	100%	\$800	#####	\$ 1,031		
CCB-22	Happy Canyon Creek	MDP Priority 1 Project	6,600 lf of stream reclamation upstream of I-25	1.25	mi			100	lbs/mi	125	lbs/yr	Storm Flow	90%	113	lbs/yr	\$ 7,702	\$ -	\$ -	\$ -	\$ 2	\$ 415	25%	\$1,926	#####	\$ 921		

Basis for Analysis

- (A) Unit cost of phosphorus removal based on annualized cost of completed project over 35 years at 4% interest rate. **CRF = 0.053577**
- (B) All projects identified provide for additional phosphorus immobilization beyond minimum requirements, unless noted otherwise.

NOTES:

- 1. Assumed that augmentation for consumptive use not required
- 2. Augmentation for naturally established wetlands not required (assumption)
- 8. Water costs at \$ **6,500** per acre foot
- 9. Present worth of capital replacement
- 11. Land acquisition and water augmentation not defined. CWSD/ACWWA JWPP project influenced scope of project.
- 12. Total Phosphorus loading derived from laboratory sediment samples & Stantec Geomorphic Study BANCS analysis.
- 15. Estimate based on costs for similar work along East Shoreline dating back to 1996
- 16. Benefit approximated based on other shoreline projects and estimates
- 17. Loads and performance based on calculations for 3 McMurdo Gulch ponds.
- 18. SEO opined that ET must be augmented. Also, recent Reservoir fluctuations may render project infeasible. Placed on indefinite hold.
- 19. Technical feasibility may change with CDOT bridge replacement and Valley Country Club assistance
- 20. Joint project with CCSF. Integrate design with Dog Park uses and improvements. Estimate based on similar stream stabilization projects

REFERENCES

- 1. Muller Eng 2003. *Feasibility Evaluation for Cherry Creek State Park Wetlands Project*
- 2. Muller Eng 2003. *Feasibility Evaluation for Cottonwood Creek Stream Stabilization Project*
- 3. AMEC 2005. *Draft Feasibility Report Cherry Creek Reservoir Destratification*
- 4. AMEC 2006. *Recommendations for Prepurchase of Jamor Equipment for Cherry Creek Reservoir Destratification Project.*
- 5. Tetra Tech August 2006. *Phosphorus Estimates in Cherry Creek and Cost for Removal via Sediment Trap.*
- 6. WERF 2000. *Phosphorus Credit Trading in the Cherry Creek Basin: An Innovative Approach to Achieving Water Quality Benefits.*
- 7. Ruzzo, WP September 5, 2003. *Cherry Creek Corridor Master Plan-Estimate of Phosphorus Reduction from Stream Reclamation*
- 8. Ruzzo, W. P. September 21, 2006. *Cottonwood Creek Reclamation - Water Rights Augmentation Requirements.*
- 9. TetraTech December 2006. *Design of Cherry Creek Sediment Basin and Stream Stabilization.*
- 10. Brown and Caldwell Feb 2007. *Shop Creek Wetlands Pollutant Reduction Facility Wetland Assessment*
- 11. PBSJ October 2006. *Draft McMurdo Gulch Major Drainageway Master Plan*
- 12. Brown and Caldwell 2010. *Cherry Creek Stream Reclamation at Shop Creek Trail.*
- 13. CCBWQA TAC June 16, 2011. *Stream Reclamation Water Quality Benefit Evaluation Interim Status Report*
- 14. Ruzzo Memo, September 4, 2013. *West Shade Shelter Shoreline Stabilization PRF - Water Quality Analysis.*

	A	B	C	F	H	I	J	K	L	M	P	V	AB	AH	AN	AP	AQ	AR	AS	AT	
1	CHERRY CREEK BASIN WATER QUALITY AUTHORITY																				
2	TABLE 2 - SUMMARY OF RECOMMENDED POLLUTANT REDUCTION FACILITIES																				
3	2019 - 2028 BUDGET PROJECTIONS (1000\$)⁵																				
4		October 5, 2018	Current Project Budget				Prior Year Obligated Funds³	Residual PRF Costs	Proposed 2019 Budget			Proposed 2020 Budget	Proposed 2021 Budget	Proposed 2022 Budget	Proposed 2023 Budget	Proposed 2024 Budget	Proposed 2025 Budget	Proposed 2026 Budget	Proposed 2027 Budget	Proposed 2028 Budget	
5	Project No.	Project Title	Capital¹	Total	Authority Portion	Authority Portion			Design²	Capital	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	
7	CCB-5.4	Cherry Creek Stream Reclamation at Main Street (Parker)	\$ 1,776	\$ 1,776	\$ 200	11%	\$ -	\$ 200	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 200	\$ -	\$ -	\$ -
8	CCB-5.6	Cherry Creek Stream Stabilization at Lincoln Avenue (Parker)	\$ 1,447	\$ 1,447	\$ 304	21%	\$ -	\$ 304	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 304	\$ -	\$ -
12	CCB-5.14	Cherry Creek Stream Reclamation - Reach 3	\$ 2,567	\$ 2,567	\$ 640	25%	\$ -	\$ 640	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300	\$ 340	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
13	CCB-5.14	Cherry Creek Stream Reclamation - Reach 4	\$ 2,720	\$ 2,720	\$ 680	25%	\$ -	\$ 680	\$ -	\$ -	\$ -	\$ 180	\$ 300	\$ 200	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
14	CCB-5.16	Cherry Creek Stream Reclamation - CCSP Reach I	\$ 2,220	\$ 2,220	\$ 2,220	100%	\$ 100	\$ 2,120	\$ -	\$ 350	\$ 350	\$ 200	\$ -	\$ 400	\$ 400	\$ 450	\$ 320	\$ -	\$ -	\$ -	\$ -
15	CCB-5.17	Cherry Creek Stream Reclamation - U/S Scott Road (Parker)	\$ 1,100	\$ 1,100	\$ 170	15%	\$ -	\$ 170	\$ -	\$ 170	\$ 170	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
16	CCB-7.2	McMurdo Gulch Reclamation (Castle Rock)	\$ 1,677	\$ 1,677	\$ 420	25%	\$ 34	\$ 386	\$ -	\$ 386	\$ 386	\$ -	\$ -	\$ -	\$ -						
17	CCB-16	Stream Corridor Preservation	\$ 100	\$ 100	\$ 100	100%	\$ -	\$ 100	\$ -	\$ -	\$ -	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50
18	CCB-17.4	East Boat Ramp Shoreline Stabilization Phase II	\$ 80	\$ 80	\$ 80	100%	\$ -	\$ 80	\$ -	\$ -	\$ -	\$ 80	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
19	CCB-17.5	East Shade Shelter Shoreline Stabilization Phase II	\$ 60	\$ 60	\$ 60	100%	\$ -	\$ 60	\$ -	\$ -	\$ -	\$ 60	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
21	CCB-17.6	West Shade Shelter Shoreline Stabilization PRF	\$ 950	\$ 950	\$ 950	100%	\$ 120	\$ 830	\$ -	\$ 530	\$ 530	\$ 300	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
22	CCB-17.7	Tower Loop Shoreline Stabilization Phase II	\$ 100	\$ 100	\$ 100	100%	\$ -	\$ 100	\$ -	\$ -	\$ -	\$ 100	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
23	CCB-19	Non-point Pollutant Management	\$ 100	\$ 100	\$ 100	100%	\$ -	\$ 100	\$ -	\$ -	\$ -	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50
24	CCB-21	Lone Tree Creek in CCSP	\$ 2,800	\$ 2,800	\$ 700	25%	\$ -	\$ -	\$ 65	\$ -	\$ 65	\$ 300	\$ 335	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
25	CCB-	Interpretive PRF Signage @ 12-Mile Park (2 signs) & WBR (1 sign)	\$ 30	\$ 30	\$ 30	100%	\$ -	\$ 30	\$ -	\$ -	\$ -	\$ 30	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
26		SUB-TOTALS						\$ 5,800	\$ 65	\$ 1,436	\$ 1,501	\$ 1,350	\$ 735	\$ 1,000	\$ 840	\$ 550	\$ 620	\$ 404	\$ 100	\$ 100	
27																					
28																					
29																					

	A	B	C	F	H	I	J	K	L	M	P	V	AB	AH	AN	AP	AQ	AR	AS	AT
1	CHERRY CREEK BASIN WATER QUALITY AUTHORITY																			
2	TABLE 2 - SUMMARY OF RECOMMENDED POLLUTANT REDUCTION FACILITIES																			
3	2019 - 2028 BUDGET PROJECTIONS (1000\$)⁵																			
4		October 5, 2018	Current Project Budget				Prior Year Obligated Funds³	Residual PRF Costs	Proposed 2019 Budget			Proposed 2020 Budget	Proposed 2021 Budget	Proposed 2022 Budget	Proposed 2023 Budget	Proposed 2024 Budget	Proposed 2025 Budget	Proposed 2026 Budget	Proposed 2027 Budget	Proposed 2028 Budget
5	Project No.	Project Title	Capital¹	Total	Authority Portion	Authority Portion			Design²	Capital	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
30	OPERATIONS AND MAINTENANCE																			
31	Rehabilitation Category																			
33	OM-	Emergency or Unplanned Repairs	\$ 40	\$ 40	\$ 40	100%	\$ -	\$ -	\$ -	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40
34	SUB-TOTAL						\$ -	\$ -	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40
35	Restorative Category																			
36	OM-	Tree/Shrub Planting	\$ 5	\$ 5	\$ 5	100%	\$ -	\$ -	\$ 2	\$ 2	\$ 3	\$ 3	\$ 4	\$ 4	\$ 4	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5
37	OM-	Fence Repair ⁷	\$ 5	\$ 5	\$ 5	100%			\$ 8	\$ 8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
38	OM-	Shoreline / Bank Restoration ⁸																		
39		Tower Loop Bank Restoration				100%			\$ -	\$ 16	\$ 16	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
40		E. Shade Shelter Bank Stabilization				100%			\$ -	\$ 18	\$ 18	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
41		E. Boat Ramp Bank Stabilization				100%			\$ -	\$ 35	\$ 35	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
42		12-Mile Phase I Bank Stabilization				100%			\$ -	\$ 16	\$ 16	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
43		12-Mile Phase II Bank Stabilization				100%			\$ -	\$ 6	\$ 6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44	OM-	Wetland Harvesting	\$ 50	\$ 50	\$ 50	100%			\$ -	\$ 40	\$ 40	\$ 40	\$ 50	\$ 60	\$ 60	\$ 80	\$ 100	\$ 100	\$ 100	\$ 100
45	SUB-TOTAL						\$ -	\$ -	\$ 141	\$ 141	\$ 43	\$ 53	\$ 64	\$ 64	\$ 84	\$ 105	\$ 105	\$ 105	\$ 105	\$ 105
46	Routine Category																			
47	OM-7	Reservoir Destratification	\$ 93	\$ 93	\$ 93	100%	\$ -	\$ -	\$ -	\$ 67	\$ 67	\$ 95	\$ 67	\$ 100	\$ 80	\$ 100	\$ 80	\$ 100	\$ 80	\$ 100
48	OM-14.1	PRF Weed Control	\$ 16	\$ 16	\$ 16	100%	\$ -	\$ -	\$ -	\$ 7	\$ 7	\$ 8	\$ 8	\$ 9	\$ 9	\$ 9	\$ 10	\$ 10	\$ 10	\$ 10
49	OM-14.2	PRF Reseeding at CCSP	\$ 27	\$ 27	\$ 27	100%	\$ -	\$ -	\$ -	\$ 7	\$ 7	\$ 8	\$ 8	\$ 9	\$ 9	\$ 9	\$ 9	\$ 9	\$ 10	\$ 10
50	OM-14.3	PRF Mowing	\$ 2	\$ 2	\$ 2	100%			\$ -	\$ -	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2
51	SUB-TOTAL						\$ -	\$ -	\$ 81	\$ 81	\$ 113	\$ 85	\$ 119	\$ 100	\$ 120	\$ 101	\$ 121	\$ 102	\$ 122	\$ 122
52	Operations Category																			
53	O -	Compressor Building Air Conditioning System				100%			\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
54	SUB-TOTAL								\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
56	SUB-TOTAL O&M						\$ -	\$ -	\$ 347	\$ 347	\$ 196	\$ 178	\$ 223	\$ 204	\$ 244	\$ 246	\$ 266	\$ 247	\$ 267	\$ 267
57	GRAND TOTAL						\$ 5,800	\$ 65	\$ 1,783	\$ 1,848	\$ 1,546	\$ 913	\$ 1,223	\$ 1,044	\$ 794	\$ 866	\$ 670	\$ 347	\$ 367	\$ 367
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- NOTES:**
- Includes engineering, construction, administration, and contingency
 - Includes technical feasibility, design, construction observation and administrative costs
 - Accumulative expenditures for the project, based on previous years accounting and estimate of current year expenses. All O&M work assumed to be fully obligated.
 - Capital costs and potential benefits unknown. Values are place holders.
 - This budget is the TAC recommendation. The funds allocated to each project are subject to further Board approval.
 - Projects completed in prior years are not shown.
 - 12-Mile Park Ph1
 - 12-Mile Ph1 & P2 (bank); E. Boat Ramp, E. Shades & Tower Loop (Shoreline)

CHERRY CREEK BASIN WATER QUALITY AUTHORITY
2019- 2028 CIP Notes

The following is a brief description of each of the projects identified in the 2019 10-Year CIP Table 2, Summary of Recommended Pollutant Reduction Facilities. PRFs that have been completed are not shown unless work continues on the PRF.

1. 2019-2028 Capital Project Budget Projections

- a. CCB-5.4 – Cherry Creek Stream Reclamation at Main Street Parker. At Parker’s request, this project is delayed since the reach appears to be stable at this time. It has been included in the CIP for proposed funding in 2025.
- b. CCB-5.6 – Cherry Creek Stream Reclamation at Lincoln Avenue: At Parker’s request, this project is delayed since the reach appears to be stable at this time. It has been included in the CIP for proposed funding in 2026.
- c. CCB-5.14 – Cherry Creek Stream Reclamation – Reach 3 (L ≈ 2,650 lf) extends from the City Limits of Aurora southerly to approximately the low water pedestrian crossing at the west side of the City of Aurora soccer fields. The current estimated cost for Reach 3 is \$2.57 M with the water quality component estimated to be \$640,000. Funding is proposed in 2022 and 2023.
- d. CCB-5.14 – Cherry Creek Stream Reclamation – Reach 4 (L ≈ 2,500 lf) extends from the low water pedestrian crossing at the west side of the City of Aurora soccer field, southerly to approximately the pedestrian bridge at the southeast side of the City of Aurora soccer fields. The current estimated cost for Reach 4 is \$2.72 M with the Authority’s water quality component share estimated to be \$680,000. Funding is proposed in 2020, 2021 and 2022.
- e. CCB-5.16 – Cherry Creek Stream Reclamation – Reach 1 includes stream stabilization of the right bank breach located at the downstream of the 12-Mile Park Phase 1 project. This project is funded in total by the Authority at an estimated cost of \$450,000 for design and construction. Construction funding is proposed in 2019.
- f. CCB-5.17 – Cherry Creek Stream Reclamation upstream of Scott Road (@ the KOA Tower). Parker has requested funding for this project in 2019. The current estimated cost for the Project is \$1,100,000 with the Authority’s water quality component share estimated to be \$170,000.
- g. CCB-7.2 – McMurdo Gulch Reclamation. This project continues the partnership with Castle Rock to stabilize segments of McMurdo Gulch currently experiencing degradation. A 2016 Stream Assessment of McMurdo Gulch identified several areas experiencing channel degradation which have been included in the Town’s 5-Year CIP. Design funding was completed in 2018 and construction funding is proposed in 2019. The Authority’s water quality component share for design and construction is estimated to be \$420,000.
- h. CCB-16 – Stream Corridor Preservation. This project consists of partnering with other agencies to acquire conservation easements or other measures to preserve stream corridors. Since no projects have been defined at this time, this value is a place holder.
- i. CCB-17.4 – East Boat Ramp Shoreline Stabilization Phase II. Identified during 2014 annual inspection. This project is funded in total by the Authority at an estimated cost of \$80,000. Funding is proposed in 2020.
- j. CCB-17.5 – East Shade Shelter Shoreline Stabilization Phase II. Identified during 2014 annual inspection. This project is funded in total by the Authority at an estimated cost of \$60,000. Funding is proposed in 2020.
- k. CCB-17.6 - West Shade Shelter Shoreline Stabilization. Identified during 2005 annual inspection. This project is funded in total by the Authority at an estimated cost of \$950,000. Design funding was included in 2018 (\$120,000) and construction funding is proposed in 2019 at an estimated cost of \$830,000.

- l. CCB-17.7 - Tower Loop Shoreline Stabilization Phase II. Identified during the 2014 annual inspection. This project is funded in total by the Authority at an estimated cost of \$100,000. Funding is proposed in 2020.
- m. CCB-19 – Non-point Source Pollutant Management. Project undefined at this time. Since no projects have been defined at this time, this value is a place holder.
- n. CCB-21 – Lone Tree Creek in CCSP. Centennial has requested funding for design in 2019 and construction in 2020 for a segment of Lone Tree Creek improvements within CCSP in conjunction with their trail extension project. A 2014 conceptual design report prepared by ICON Engineers proposed a trapezoidal conveyance channel; however, at 2016, and 2018, project meetings attended by the Authority and Parks, it was concluded the Lone Tree Creek improvements would replicate those of Cottonwood Creek. The ICON report extended the Lone Tree Creek improvements from the south boundary of CCSP to the water quality pond below the ACWWA wastewater treatment facility; and didn't extend downstream from that pond to the confluence with Cottonwood Creek. This estimated budget cost for 2020 and 2021 assumes the Authority will cost share in funding the water quality component identified in the ICON report at a 25/75 level, and 100% for the downstream reach. It is suggested that during a future design meeting, the concept of a 25/75 match be explored for the entire length of Lone Tree Creek.
- o. CCB-xx – Interpretive PRF Signage @ 12-Mile Park (2 signs) and West Boat Ramp (1 sign). This was identified as an opportunity to promote and educate the public on water quality by highlighting each project. This project is funded in total by the Authority at an estimated cost of \$30,000. Funding is proposed in 2020.

2. 2019 – 2028 O&M Budget Projections.

- a. OM- Emergency or Unplanned Repairs. Following the 2013 flooding, this line item was added to provide flexibility within the budget to address emergency or unplanned water quality repairs.
- b. OM- Tree / Shrub Planting. Provides for tree and shrub replacements as required.
- c. OM- Fence Repair. Provides for fence repairs as required.
- d. OM- Shoreline / Bank Restoration. Provides for shoreline and/or bank restoration as required.
- e. OM- Wetland Harvesting. This pilot project will sample (harvest), test, and remove from the site, within a controlled area of wetland vegetation from designated wetland site(s) to provide data/information regarding the level of nutrients that can be removed from a wetland harvesting program. Data obtained can aid in future larger scale nutrient removal programs within the basin.
- f. OM-7 – Reservoir Destratification. Routine operation, inspection, repairs, and maintenance of compressor and in-lake aeration system. Additional days for aerator inspection and repair of corroded components is included in the estimate.
- g. OM – Monitoring Station Repair/Upgrade. This budget includes repair or upgrade to the existing monitoring stations owned / maintained by the Authority.
- h. OM-14.1 & OM-14.3 – PRF Weed Control and mowing in CCSP. Ongoing effort for all PRFs includes mowing and chemical application. Authority 100% responsible for 5-years, thereafter, the Authority equally shares cost w/CCSP.
- i. OM-14.2 – PRF Reseeding in CCSP. Routine effort to maintain PRF vegetation at CCSP. With purchase of seed drill on behalf of Parks in 2018, revegetation budgeted costs can be reduced in 2019 to the estimated cost / quantity of native seed required. Parks will provide the labor and equipment.

3. 2019 – 2028 Operations Budget Projections.

- a. O - Compressor Building Air Conditioning System. Purchase and installation of a new mechanical air conditioning system for the existing compressor building is proposed in 2019.

The Authority currently operates the system between May 1st through the July 4th week-end. Each year the destratification system experiences high temperature shut-down and requires a manual restart following a cool down period. During compressor operations, temperatures inside the building can reach 110° F when the outside air temperatures reach the upper 80' s to 90° F. The system is unable to cool down sufficiently and will automatically shut down. The cooling unit detail proposed is taken from the recent EATON study detail.

Cherry Creek Basin Water Quality Authority
Summary of Operation & Maintenance (O&M) Costs

Prepared / Updated: July 18, 2018

Project	Quantity			Mowing	Herbicide Application	Reseeding	Tree Planting	Shrub Planting	Misc.	Restorative / Rehabilitation project	Comments
	Each	Hours	Acres								
Shop Creek ^{1,2}			4		\$ 400				\$ 600		50/50 split w/CCSP
Cottonwood Creek Ph I & Ph II ^{1,2}			20		\$ 2,000						50/50 split w/CCSP
			1.5			\$ 1,200					Seed only
Cottonwood Wetlands ⁴			2		\$ 200						50/50 split w/CCSP
			0.5			\$ 400					Seed Only
CC @ 12-Mile Park Ph I ^{1,2}			3		\$ 600						
			1			\$ 800					Overseed
	1									\$ 23,500	Relocate fence along concrete sidewalk access, repair channel bank & install massive 2-rail fence @ sidewalk
CC @ 12-Mile Park Ph II ³			13		\$ 2,600						
			3			\$ 2,400					Overseed & Revegetate swale & social trails along DOLA trail
	30							\$ 1,800			Replacement shrubs @ access points
	1									\$ 6,300	Repair soil wrap bank area
Mountain/Lake Loop Shoreline ^{2,3}			5		\$ 1,000						
			2			\$ 1,600					Overseed & Revegetate social trails
East Boat Ramp	1								\$ 34,500		Restore shoreline area
East Shade Shelter	1								\$ 18,400		Restore shoreline area
Dixon Grove									\$ -		
Tower Loop	1								\$ 16,100		Restore shoreline area
Quincy Drain											
West Boat Ramp											WBR is CCSP Maintenance Responsibility

Subtotal	\$ -	\$ 6,800	\$ 6,400	\$ -	\$ 1,800	\$ 600	\$ 98,800
TOTAL	\$ 114,400						

Note 1. Mowing Rate = \$200/hr. Herbicide Application Rate = \$100/acre. Participation @ 50/50 w/Parks.

Note 2. Reseeding Rate = \$800/acre. Seed purchase only.

Note 3. Mowing Rate = \$200/hr. Herbicide Application Rate = \$100/acre. Participation @ 100%.

Note 4. Tree Replacement = \$1,000/ea. Shrub Replacement = \$50/ea.. Participation @ 100%.

**Cherry Creek Basin Water Quality Authority
2019 Destratification System O&M**

Prepared\Updated: August 17, 2018

Item #	Item	Budget		Comment
1	Utilities	\$ 29,000		
	a. Electric		\$ 25,000	
	b. Phone		\$ 4,000	cell dialer
2	Compressor Maintenance	\$ 16,500		
	a. Compressor maintenance		\$ 8,000	Power Service
	c. Service parts		\$ 500	
	d. Miscellaneous replacement parts		\$ 4,000	for compressor
	e. Contingency		\$ 4,000	
3	Aerator Head Maintenance	\$ 21,400		B&RW
	a. Inspect, clean, repair		\$ 14,000	routine costs plus 5% plus misc.parts
	b. Extra - Inspect/Clean Qwik Disconnect Couplers		\$ 500	
	c. Spare Filters		\$ 800	
	d. Spare Diffusers		\$ 800	
	e. Spare Funnel\Cones		\$ 800	
	f. Spare proprietary regulators		\$ 800	Obtained 25 @ \$0/ea in 2012
	g. Spare floats		\$ -	
	h. Spare stainless Tees, fittings, couplers, valves		\$ 1,500	
	i. Spare stainless pins for qwik disconnect & cams		\$ 1,500	
	j. New washers to prevent regulators from dislodging		\$ 200	
	k. Contingency		\$ 500	
	Grand Total	\$ 66,900		