

**Feasibility of the
Chilcott Ditch
Augmentation Station Outfall Embankment Armament**

Sponsored by the
Chilcott Ditch Company

in conjunction with

The Colorado Water Conservation Board

June 2018

FEASIBILITY STUDY APPROVAL

Pursuant to Colorado Revised Statutes 37-60-121 & 122, and in accordance with policies adopted by the Board, the CWCB staff has determined this Feasibility Study meets all applicable requirements for approval.

 7/2/2018
Signed Date

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Chilcott Ditch Company

James Taylor
President

Jessie Shaffer
Secretary

Mike Fink
Treasurer

Attorney for the Chilcott Ditch Company

Jane B. Fredman
13511 Northgate Estates Drive, Suite 250
Colorado Springs, CO 80921
(719) 434-5607

Engineering and Technical Support

Matrix Design Group
2345 Research Parkway, Suite 300
Colorado Springs, CO 80920
(719) 575-0100

Acknowledgement of those who assisted in the preparation of this report:

Jessie J. Shaffer

Secretary, Chilcott Ditch Company

Brett Gracely, P.E.

Matrix Design Group

Feasibility Study
Chilcott Ditch Company
Augmentation Station Outfall Embankment Armament Project

Introduction (Need for the Project)

The Chilcott Ditch Company (the “Company”), located in El Paso County, operates the Chilcott Ditch for the benefit of its shareholders by providing direct flow irrigation water. The ditch diverts from Fountain Creek, just north of the Town of Fountain, and water deliveries are made through the Company’s eight-mile-long ditch to service historically irrigated areas under the ditch as well as to an augmentation station that measures return flow to Fountain Creek on behalf of shareholders taking delivery of their pro-rata share through the augmentation station. Over time the streambank near the augmentation station has eroded and undercut the augmentation station flume. This has caused concern about the structural stability and discharge functionality of the augmentation station. The Company has concluded that the protection of the augmentation station is needed. The Company desires to stabilize the embankment and reconstruct the outfall and sand discharge line considering a 100-yr flood recurrence interval and associated streamflow and water surface profile. The Company is wanting to prepare for 2018 construction.

Project Sponsor

The Company is a mutual ditch company and a non-profit corporation registered in the State of Colorado. There are currently 6 shareholders that own various amounts of the 105 shares of outstanding company stock. Currently, shareholders within the Company are entirely comprised of Special Districts, School Districts, Home Rule Cities (or enterprises thereof) or local governmental agencies within El Paso County. The Company has the power to set annual assessments to be paid by the shareholders, the power to curtail water deliveries to shareholders that fail to pay their assessments, and the power to offer stock for sale to pay back assessments. The Company’s articles of incorporation and by-laws are included in Appendix A.

Project Service Area and Facilities

The Company provides irrigation water to approximately 1,800-acres of actively cultivated property within in El Paso County. The Company also returns water (both Chilcott water as well as foreign water) directly to Fountain Creek via its augmentation station on behalf of its shareholders for augmentation or supplemental supply to their municipal or district service areas. Individual shareholders maintain shares for their pro-rata portion of Chilcott water rights, but in addition some shareholders maintain decrees for their specific uses separate and distinct from the water rights of the Chilcott Ditch Company (i.e. foreign water) that is diverted by the Company, measured and then returned to Fountain Creek pursuant to individual carriage agreements between shareholders and the Company. The headgate of the ditch is located on Fountain Creek north of the City of Fountain. The ditch courses approximately 8 miles, generally in a southeasterly direction, terminating at the Company’s Calhan Reservoir. A siphon structure is located approximately 3.3 miles downstream of the headgate where it crosses Jimmy Camp Creek. Irrigated acreage within the service area is primarily used for cattle ranching, hay production, and soil conservation activities.

A map of the ditch and photos of the existing Parshall measurement flume, siphon, and augmentation station are shown on pages 3 - 5. A map of the irrigation service area is shown in Appendix G of this report.

Hydrology and Water Rights

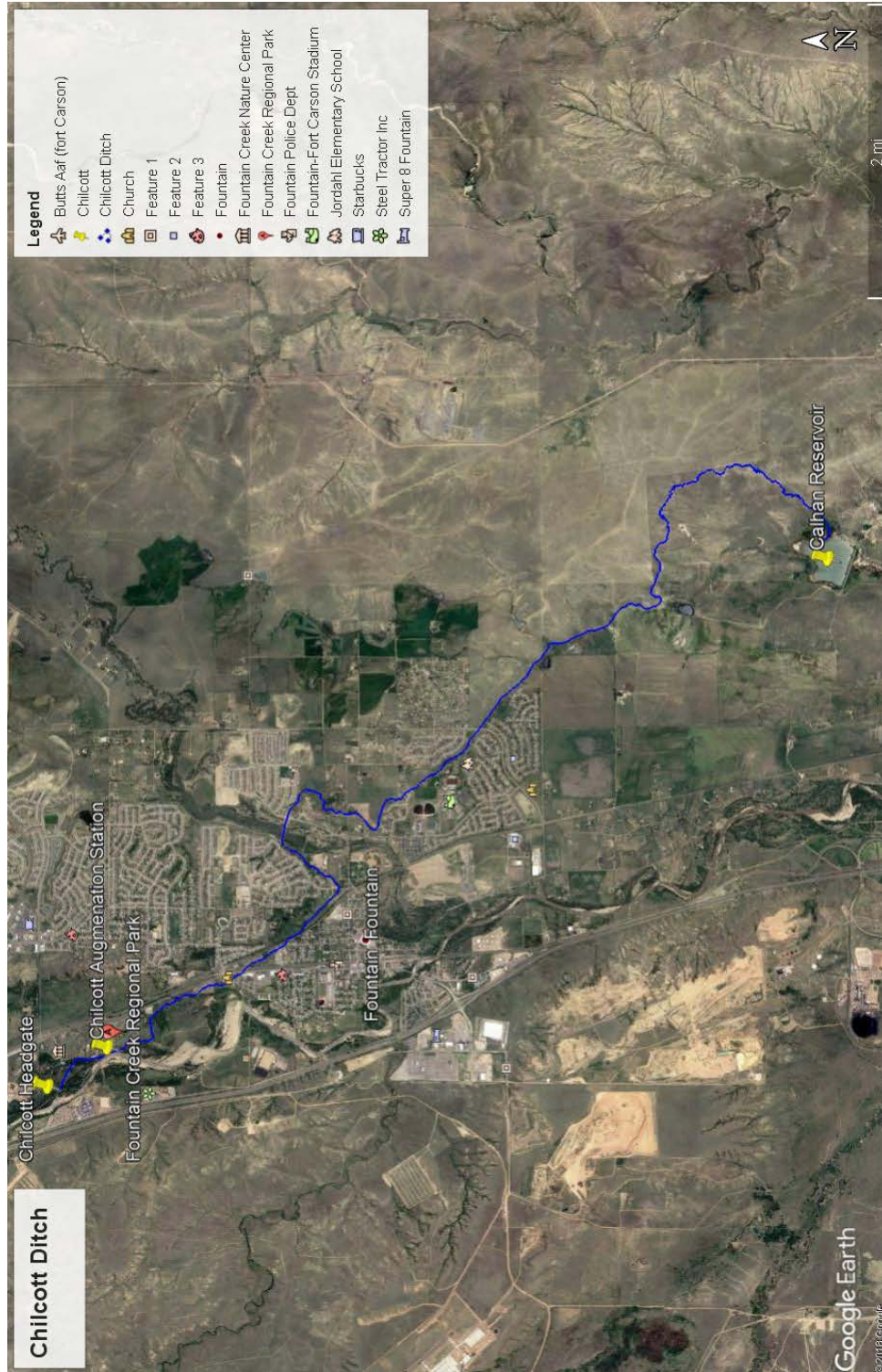
The source of water for the Company and its contract carriage obligations is direct flow water rights from Fountain Creek. The water rights diverted at the Company head gate consist of 14 distinct rights with dates of appropriation ranging from 1861 to 1909 and totaling 90.8 cfs. The Company owns 3 of these rights totaling 55.4 cfs with the remaining 35.4 cfs being contract carriage water (i.e. water not decreed to the Company) that is diverted and delivered by agreement between the Company and the owners. All current carriage agreement owners are also shareholders of the Company. In 2006, shareholders representing 20.5 shares (of the 105 outstanding) received a water court decree that quantified the historical use, including ditch-wide historical river headgate diversions and consumptive use of the Company water rights, in water court case no. 2006CW119. The relevant findings of that decree are summarized in the table below. A copy of the decree is provided as Appendix C.

Table 1

Summary of Chilcott Ditch Ditch-Wide Historical Consumptive Use Quantification (Case No. 2006CW119)	
	Ditch-Wide Quantification
Study Period	1940-2005
Average River Headgate Diversions	4,961 af/yr (47.25 af/share/yr)
Average Farm Headgate Deliveries	4,465 af/yr (42.52 af/share/yr)
Average Historical Consumptive Use	2,584 af/yr (24.61 af/share/yr)
Average Historical Return Flows	1881 af/yr (17.91 af/share/yr)

As noted in Table 1, the Company water rights, on average, divert 4,961 af of water per year with over half of that amount (2,584 af/year) being consumptive use.

Location Map and Ditch Course



Photos of Current Streambank and Outfall Conditions



Chilcott Ditch Parshall Flume



Chilcott Ditch Augmentation Station & Parshall Flume



Project Description and Alternatives

The purposes of this project are:

- to stabilize the streambank upstream and immediately downstream of the existing augmentation station;
- to reinforce the foundation of the Augmentation Station discharge flume; and
- to replace the augmentation station waste gate sand line.

Four alternatives were considered:

1. The no-action alternative;
2. Stabilize the embankment and reconstruction of the sand discharge line;
3. Move the augmentation station to a more stable location;
4. Develop a regional solution with partners to stabilize a longer reach of the upstream Fountain Creek streambank.

Alternative No. 1 was considered unacceptable since it means the Company must incur a great amount of risk and potential liability if the augmentation fails.

Alternative No. 2 was selected, since it is the least costly approach that provides the necessary and immediate action required to protect the augmentation station.

Alternative No. 3 was ruled out due to; a) the time frame of the project for immediate action to take place to protect the existing augmentation station and b) the complicated process adjusting the water rights and permitting for such a task.

Alternative No. 4 was ruled out due to the immediate nature of the project but would be considered for future work.

The selected alternative, Alternative No. 2, involves a design for upstream bank stabilization and localized reinforcement to maintain structural stability and discharge functionality. This work will also include the reconstruction of the sand discharge line for better performance. The Company desires to stabilize the embankment and reconstruct the outfall and sand discharge line considering a 100-yr flood recurrence interval and associated streamflow and water surface profile.

Matrix Design Group, Inc. (Matrix) has prepared cost estimates for engineering design and construction for the project and has also prepared conceptual plans which are attached in the back pocket of this study.

The AACE upper estimated cost to construct the project is \$435,000 with additional Engineering Fees of \$51,325 for a total estimated project cost of \$486,325. The cost breakdown is summarized in Tables 2 and 3 below.

Table 2. Chilcott Ditch Company – Augmentation Station Outfall Embankment Armament Project - Cost Estimate

BID ITEM	DESCRIPTION OF	QUANTITY	UNIT	UNIT COST	TOTAL COST OF
1	Mobilization	1	LS	\$25,000.00	\$25,000
2	Traffic Control	1	LS	\$500.00	\$500
3	Water Control and Dewatering	1	LS	\$15,000.00	\$15,000
4	Erosion and Sediment Control	1	LS	\$5,000.00	\$5,000
5	Earthwork	350	CY	\$30.00	\$10,500
6	D50 = 36" Soil Filled Riprap	1,930	CY	\$90.00	\$173,700
8	Geotextile Fabric	550	SY	\$7.00	\$3,850
9	12" PVC Pipe	70	LF	\$110.00	\$7,700
10	Revegetation (Seeding and Mulching)	20	SY	\$15.00	\$300
				Total	\$241,600

AACE Class 5 Low Estimate (-40%) \$145,000

AACE Class 5 Upper Estimate (+80%) \$435,000

Table 3. Engineering Fee Estimate

Tasks	Fee
1. Data Collection (incl. Survey & Geotech.)	\$ 13,055
2. Engineering Design Services (incl. Bid and Contract)	\$ 24,810
3. Engineering Services During Construction	\$ 12,780
4. Direct expenses	\$ 680
Grand Total	\$ 51,325

Project Total = \$486,325

Implementation Schedule

Matrix will coordinate with Chilcott staff to prepare for 2018 construction. It is estimated that the proposed design will require 4 weeks for construction assuming pre-planning for material delivery and allowing for unforeseeable weather and streamflow conditions.

Permitting

All easements and rights of way have previously been obtained. A City of Fountain Street Cut permit will be obtained by the Contractor after award of the construction contract and the Company expects to be exempt from 404 permitting by Statutory exemption, 33 CFR Section 323.4(a) 3. This will be confirmed with the Army Corps of Engineers.

Institutional Considerations

Entities that are, or may be, involved in the design, construction, and financing of the project include:

- Chilcott Ditch Company; financing and project management
- Matrix Design Group, Inc.; design and construction engineering services
- Colorado Water Conservation Board (CWCB); financing

The Company will be the lead for the financing, design, and construction of the project and will be the entity entering into contracts and agreements with the various entities for the services provided by the Company.

Financial Analysis

The Company is applying for a loan from the CWCB in a maximum amount of \$486,325, to fund the project, however it is understood by the Company that the amount of the loan, if approved, will be limited to the lesser of; a) the maximum amount applied for, or b) the actual cost of the project to include engineering, construction and finance services. The Company will cover any costs that exceed the maximum loan amount.

The Chilcott Ditch Company is requesting a 20-year loan from the CWCB. Since all of the current shareholders within the Company are municipalities or local governmental agencies, it is anticipated that the standard municipal lending rate would be near 2.55%, resulting in estimated annual payments of \$31,343. The expected emergency reserve fund will be pledged by the Company from its current unrestricted reserves as indicated in its adopted 2018 budget (see Appendix D). Table 4 is a summary of the financial aspects of the project. Current annual assessments levied in support of debt service obligations is \$411 per share and anticipated assessments required to cover existing debt service plus the debt service of this project equates to \$710 per share per year.

Table 4. Financial Summary

Project Cost	\$486,325
Loan Amount (100% of Project Cost)	\$486,325
1% CWCB Loan Origination Fee	\$4,864
CWCB Loan Payment Amount (Annual Principal + Interest)	\$31,343
Outstanding Shares of Stock	105
Current Debt Service Assessment per Share	\$411
Additional Debt Service Assessment per Share	\$299
Total Debt Service Assessment per Share	\$710
Average annual Consumptive Use per share (AF)	24.61
Average Annual Debt Service Per AF Historical Consumptive Use	\$28.85

Operation and maintenance costs are not anticipated to change as a result of the project, however, modest increases, if any, are anticipated to be covered by the Company's annual income.

Credit worthiness: The Company currently has outstanding debt in the form of two (2) loans from the CWCB. The first which was funded in 2001 for reconstruction of the Company's diversion dam and the second funded in 2017 for reconstruction of the company's Jimmy Camp Creek Siphon. The principal balance, as of December 31, 2017, on the Company's outstanding debt is \$595,676 with annual payment obligations of \$43,135/year. To our knowledge, the Company's repayment history on these loans has no flaws (i.e. defaults, late payments, etc.). In addition, Company stock is valued at \$147,660/share based on recent sales information, which, for 105 outstanding shares equates to over \$15.5 Million dollars of net worth for outstanding Company stock. As previously stated, the Company has the power set annual assessments to be paid by the shareholders in support of debt service repayment and Company operating costs and the power to offer stock for sale to pay back assessments should shareholders fail to pay their assessments.

Table 5 shows the Financial Ratios for the Company as well as debt to equity ratios on a per share of stock basis. The ratios indicate the company has average to strong ability to repay the loan and the debt to equity ratio indicates shareholder equity is high in relation to debt, even with the additional debt service.

Table 5. Financial Ratios

Financial Ratio	⁽¹⁾Without Project	⁽²⁾With Project
Operating Ratio (revenue/expense)	1.35% (average)	1.12 (average)
Debit Service Coverage Ratio	2.23 (strong)	1.29 (average)
Cash Reserves to Current Expense	155% (strong)	128% (strong)
Annual Debt Service Cost per acre-foot	\$8.69 (strong)	\$15.01 (strong)
⁽²⁾ Stock Debt to Equity Ratio	3.84% (strong)	6.97% (strong)

- (1) Assumes assessments of \$1,500/share of stock
- (2) Debt to Equity ratio calculated as total debt liability per share divided by current market value per share and assumes no stock owner has pledged all or a portion of their stock equity to third party lenders

Alternative financing considerations: The Company has investigated alternative financing sources, primarily funding through Colorado Water and Power Authority. However, those sources are not expected to be able to fund the project pursuant to the Company's desired timeline for full implementation (i.e. Aug.-Nov. 2018).

Collateral: As security for the CWCB loan, the Company can pledge assessment income, and the project itself.

Economic Analysis

The economic benefit of the project is considered to be considerable. Many of the Company's shareholders utilize the augmentation station for taking deliveries of their water which they typically use for augmentation replacement of other stream depletions and all shareholders have the opportunity to take deliveries in this fashion. Without the use of the augmentation station, these shareholders would be forced to forego diversions or lease other water rights capable of providing a similar schema of augmentation. The potential value of monetary damage attributable to an inability of shareholders to utilize the augmentation station is estimated at \$555,570 per year (\$215/AF-CU/yr. current lease rate multiplied by 24.61 AF-CU/share multiplied by 105 outstanding shares) which does not include impacts from loss of use of foreign water that is currently released from the augmentation station under various carriage agreements. Using an estimated total project cost of \$486,325 (to cover design and construction of the armament and all appurtenances, and construction supervision), the single year project cost/benefit ratio is \$486,325/\$555,570 or 0.875 which is equal to the non-discounted payback period of eleven (11) months, indicating a strong financial benefit if the project is implemented.

Social and Physical Impacts

The project will have no significant social impacts, since it will assure the continued operation of a currently existing irrigation system(s). The project will have minor physical impacts since construction is taking place on lands currently undeveloped and once construction is complete the new augmentation station will be in the same location as the existing augmentation station.

Conclusions

The Chilcote Ditch Company is an incorporated entity in the State of Colorado with the ability to enter into a contract with the CWCB for the purpose of obtaining a construction loan.

1. Financial data conclude that the Chilcote Ditch Company is a low risk borrower with average to strong ability to repay the loan obligation being sought.

2. Rights-of Way easements have been previously acquired for the project and are adequate for the construction of this project.
3. The project would provide for the continued delivery of water to shareholders of the Company.
4. The total estimated cost of the project is \$486,325 and is proposed to be financed in its entirety by the Chilcott Ditch Company.
5. The Chilcott Ditch Company is eligible for a loan from the CWCB. The project is necessary to avoid unreasonable risk of injury or damage to property, and because the condition is not the result of negligence in the operation or maintenance of the infrastructure.
6. The project is technically and financially feasible.

Appendix A

Articles of Incorporation and By-Laws

Appendix B

Not Used

Appendix C

Water Rights Summary

Ditch-wide Quantification - 2006CW119

Appendix D

Not Used

Appendix E

CWCB Loan Application

Appendix F

Financial Statements

2015 to Present

Appendix G

Preliminary Armament Plan

Map of Service Area