

(Sample Feasibility Study)

**Feasibility of Reconstruction
of the
ABC Diversion Structure**

Sponsored by the
ABC Ditch Company
in conjunction with the
Colorado Water Conservation Board

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Table of Contents

Introduction (Need for the Project).....	6
Project Sponsor.....	6
Project Service Area and Facilities	6
Hydrology and Water Rights.....	6
Project Description and Alternatives.....	9
Selected Alternative	9
Cost Estimate	9
Implementation Schedule	10
Permitting	10
Institutional Considerations.....	10
Financial Analysis.....	10
Credit Worthiness.....	11
Alternative Financing Considerations	11
Collateral	12
Economic Analysis	12
Social and Physical Impacts	12
Conclusions.....	12

List of Appendices

- Appendix A: Articles of Incorporation and By-Laws.
- Appendix B: USDA NRCS Economic Value Report.
- Appendix C: Water Rights Summary
State Engineer Diversion Reports for 1999, 2000, and 2001.
- Appendix D: NRCS Preliminary Design Report and Cost Estimate.
- Appendix E: CWCB Loan Application
CWCB Memorandum of Loan Approval
- Appendix F: Financial Statements and Budgets: 2001 - 2003.
- Back pocket: Preliminary Plan Drawings, Map of service area.

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Feasibility Study ABC Ditch Company Diversion Structure Project

Introduction (Need for the Project)

The ABC Ditch Company (ABCDC), located in El Paso County, operates the ABC Ditch for the benefit of the 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 ditch to the 2000-acre service area. A flood destroyed the ABCDC diversion in April and May 2000. The structure was breached and about 300 feet of the right abutment was washed away. The ABCDC wants to rebuild the diversion prior to the 2000 irrigation season.

Project Sponsor

The ABCDC is a mutual ditch company and a non-profit corporation registered in the State of Colorado. There are 16 shareholders and 105 shares of stock. The ABCDC has the power to set annual assessments to be paid by the shareholders, the power to cut off water deliveries to shareholders that fail to pay their assessments, and the power to offer stock for sale to pay back assessments. The ABCDC articles of incorporation and by-laws are included in Appendix A.

Project Service Area and Facilities

The ABCDC provides irrigation water to a 2000-acre service area in El Paso County. The heading for the ABC Ditch is located north of the Town of Fountain, on Fountain Creek, and extends southeast approximately 12 miles. Irrigated acreage within the service area is primarily used for cattle ranching and to grow hay. Hay crop is used as cattle feed, or is sold. A map of the ABC Ditch and photos of the existing diversion are shown on page 7. A map of the service area is in the back pocket of this report.

Hydrology and Water Rights

The source of water for the Company is direct flow water rights out of Fountain Creek. The water rights diverted at the ABCDC headgate consist of 9 rights with dates of appropriation ranging from 1863 to 1905 and totaling 104 cfs. The ABCDC owns 3 of these rights totaling 78.58 cfs. Records of the State Engineer's Office indicate that total average annual diversions are 7,425 acre-feet, based on record years 1991 through 2001, and that the maximum diversion rate was 49.5 cfs for record years 1999, 2000, and 2001. A summary of water rights and the State Engineer Diversion records for 1999, 2000, and 2001 are found in Appendix C.

Detailed Location Map

Photos of Existing Diversion

Project Description and Alternatives

The purpose of this project is to provide a means for the ABCDC to continue providing irrigation water to shareholders while minimizing the occurrence of future failures of their diversion structure. Four alternatives were considered:

1. The no-action alternative.
2. Reconstruct the diversion using steel sheet piling (\$900,000).
3. Reconstruct the diversion using roller compacted concrete (\$1.5 million).
4. Reconstruct the diversion using grouted rock (\$1 million).

Alternative No. 1 was considered unacceptable since it means the ABCDC could not deliver water to its shareholders.

Alternative No. 2 was ruled out because of the potential for large buried rock in the channel bottom.

Alternative No. 3 was ruled out due to cost.

Alternative No. 4 was selected, since it is considered to be the least costly reliable approach.

The selected alternative, Alternative No. 4, involves construction of a grouted rock diversion structure. This structure will be anchored into the riverbed and have wing walls of steel reinforced concrete. An emergency spillway section will be constructed around the right abutment and armored with riprap.

The El Paso County Office of the Natural Resources Conservation Service (NRCS) has prepared engineering designs and cost estimates for the project. Conceptual plans as prepared by the NRCS are attached in the back pocket of this study.

The estimated cost of the completed project is \$1 million. The cost breakdown is summarized in Table 1. The NRCS Preliminary Design report and detailed cost estimate are included in Appendix D.

Table 1. ABC Ditch Company – Diversion Structure Project - Cost Estimate

Item	Quantity	Unit	Unit Price \$	Amount \$
Mobilization	1	Job	32,000	\$32,000
Channel Excavation	26,000	C.Y.	3.48	\$90,480
Earthfill	13,450	C.Y.	4.64	\$62,408
Steel Sheep Pile	14,890	Sq. Ft.	23.92	\$356,169
Loose Rock Riprap	3,700	Tons	30	\$111,000
Grouted Rock Basin Floor	1,789	Tons	20	\$35,780
Grouted Rock Chute	4,122	Tons	30	\$123,660
Concrete	1,182	C.Y.	105	\$124,110
Contingency	1	Job	64,000	\$64,000
Total				\$1 million

Implementation Schedule

The NRCS is expected to complete the final design by mid-January 2002. Construction is expected to begin January 2003 and to be completed by May 2003.

Permitting

All easements and rights of way have been arranged for. 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:

ABC Ditch Company; financing and project management.
Natural Resources Conservation Service (NRCS); financing, design, and construction.
Colorado Water Conservation Board (CWCB); financing and construction,

The ABCDC 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 each.

Financial Analysis

Several entities will be involved in financing the estimated total project cost of \$1 million. The ABCDC is applying for a loan from the CWCB in maximum amount of \$250,000, to accommodate the 25% Company cost share. The actual or estimated amounts by entity are given in Table 2.

Table 2. Sources of Funding

Entity	Grant	Loan	Percent Participation
CWCB	\$0	\$250,000	25%
ABCDC	\$0	\$0	0%
NRCS	\$750,000	\$0	75%
Totals	\$750,000	\$250,000	\$1 million

The ABCDC will cover any costs that exceed the estimated project cost.

The ABCDC is requesting a 30-year loan from the CWCB. The standard agricultural lending rate would be 4%, resulting in annual payments of \$14,458. To this would be added \$1,446 per year for the first 10 years to fund the emergency reserve account, for a total annual cost of \$15,903. Table 3 is a summary of the financial aspects of the project. Annual assessments will increase from \$125 per share, up to \$276 per share with an Emergency Loan of \$250,000. This represents an annual assessment increase of \$151, or \$2.14 per acre-foot, based on average annual diversions 7,425 acre-feet.

Table 3. Financial Summary

Project Cost	\$1,000,000
Loan Amount (75% of Project Cost)	\$250,000
CWCB Loan Payment Amount, including 10% loan reserve	\$15,903
Number of Shareholders	16
Number of Shares of Stock	105
Current Assessment per Share	\$125
Future Assessment per Share	\$276
Annual Project Cost per acre-foot (Average annual diversions: 7,425 acre-feet)	\$2.14

Since all other funding for the project is in the form of grants, the Company would have no other debt service on this project. Operation and maintenance costs are expected to decrease with the new diversion structure, and can be accommodated by the Company's existing budget.

Credit worthiness: ABCDC has no existing debt. Table 4 shows the Financial Ratios for the ABCDC and indicates average to strong ability to repay with the project in place.

Table 4. Financial Ratios

Financial Ratio	Without the project		With the project	
Operating Ratio (revenue/expense)	64%	(weak)	100%	(average)
Debit Service Coverage Ratio (revenues-expenses)/debt service	No debt	(strong)	110%	(average)
Cash Reserves to Current Expense	196%	(strong)	113%	(strong)
Annual Cost per acre-foot (7,425 acre-feet diverted.)	\$1.76	(strong)	\$3.90	(strong)

Alternative financing considerations: The ABCDC has investigated alternative financing sources. They have obtained an in-kind grant from the NRCS for engineering design and construction inspection. The ABCDC has also obtained approximately \$750,000 in cost share (grant) from the Federal Emergency Watershed Program to cover 75% of the construction costs. .

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

Economic Analysis

The economic benefit of the project is considerable. The NRCS estimates the value of property affected to be \$5.5 million, within the 2000-acre service area. The short-term value of potential damage to this property in the event the ABC Diversion is not repaired is estimated as \$2.9 million. Using an estimated total project cost of \$1.1 million (to cover design, construction of the diversion and all appurtenances, construction supervision, and up to \$100,000 in cost overrun), the project cost/benefit ratio is \$2.9/ \$1.1 or 2.64.

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. The project will have minor physical impacts, once construction is complete. The new diversion structure will be in the same location and somewhat larger than the diversion destroyed during the 1999 flooding.

Conclusions

1. The ABC 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 Fund loan.
2. Rights-of Way easements are adequate for the construction of this project.
3. The project would provide for the continued delivery of irrigation water to share holders.
4. The total estimated cost of the project is \$1 million and this will be financed, in part, by in-house financing, in-kind services, and a grant from the Federal Emergency Watershed Program. The ABCDC is applying for a \$250,000 Emergency loan from the CWCB Construction Fund for the amount not covered by the federal grant.
5. ABC Ditch Company is eligible for a loan from the CWCB Emergency Infrastructure Repair Account because the project is necessary to avoid unreasonable risk of injury or damage to human health or well-being or to property or crops, and because the emergency 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 By-Laws

Appendix B

**USDA NRCS
Economic Value Report**

Appendix C

**Water Rights Summary
And
State Engineer Diversion Reports
1999, 2000, 2001**

Appendix D

**NRCS Preliminary Design Report
And
Cost Estimate**

Appendix E

CWCB Loan Application CWCB Memorandum of Loan Approval

Appendix F

**Financial Statements and Budgets
2001 to 2003**

Back pocket

**Preliminary Plan Drawings
Map of Service Area**