STATE OF COLORADO

Colorado Water Conservation Board
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TO: Colorado Water Conservation Board Members

FROM: Anna Mauss, P.E.
Mike Serlet, P.E., Chief
Water Supply Planning & Finance Section

DATE: May 12, 2009

SUBJECT: **Agenda Item 17h, May 19-20, 2009 Board Meeting**
Water Supply Planning and Finance Section – New Project Loans
Huerfano-Cucharas Irrigation Company – Cucharas Reservoir Rehabilitation

Introduction

The Huerfano-Cucharas Irrigation Company (Company) is requesting a loan from the CWCB in the amount of $1,606,000 for the Cucharas Reservoir Rehabilitation Project (Project). The Cucharas Reservoir (Reservoir) has a storage restriction from the State Engineer's Office (SEO) with a deadline of October 1, 2010 either to rehabilitate the existing dam, replace it with a new dam, or a zero storage restriction will be imposed followed by an order to breach the dam and remove the hazard it represents. This Project involves repairing the existing dam and maintaining a reduced level of storage in the Reservoir by lowering the spillway, replacing outlet gates, installing a satellite monitoring system, and updating a new Emergency Action Plan. The estimated total cost of the Project is $1,784,000. This loan request is for 90% of the estimated Project cost. See attached Project Data Sheet for a location map and a project summary.

Staff Recommendation

Staff recommends the Board approve a loan not to exceed $1,622,060 ($1,606,000 for project costs and $16,060 for the 1% Loan Service Fee) to the Huerfano-Cucharas Irrigation Company for its Cucharas Reservoir Rehabilitation Project from the Severance Tax Trust Fund Perpetual Base Account. The loan terms shall be 30 years at the agricultural interest rate of 2.5% per annum. Security for the loan shall be in compliance with CWCB Financial Policy #5.

Additional contract condition: The CWCB will not disburse funds until the SEO has approved the Project.

Background

The Company owns and operates the Cucharas No. 5 Dam and Reservoir. The Cucharas No. 5 Dam is located in northeastern Huerfano County on the Cucharas River, approximately 16 miles northeast of the City of Walsenburg. The Reservoir supplies irrigation water to cultivated lands in southeast Pueblo County, north of the Huerfano River.

The dam is a 145-foot high rock fill dam that has undergone several enlargements since the original construction in 1914. The Reservoir has a capacity of 35,395 acre-feet to the spillway crest elevation of 5766.0 feet, gauge height 120.5 feet.

In May of 1987, while the Reservoir was full to the spillway crest, the dam developed extensive seepage along the toe abutments of the dam. Immediate action was taken to lower the water level and avoid complete dam failure. It was discovered that the upstream concrete facing on the rock fill dam had failed and was allowing large quantities of seepage flow to occur through the embankment. The water surface was lowered by notching the spillway. Portions of the concrete facing were repaired in 1987 and 1988; however, during initial filling, the Reservoir dam again began to seep and the Reservoir was drained to its present restricted gauge height of 100 feet or 7,500 acre-feet of storage. The storage restriction has remained in effect since 1988 and there is a deadline of October 1, 2010 imposed by the SEO either to rehabilitate the existing dam, replace it with a new dam or a zero no-storage restriction will be imposed followed by an order to breach the dam and remove the hazard it represents. The dam has performed adequately at the restricted level with only moderate increases in seepage flow at higher storage levels being recorded, but the spillway is inadequate and there remain unknowns concerning the condition of the embankment and foundation.

In addition, the Reservoir has accumulated a large quantity of silt. The current silt level against the upstream face of the dam goes up to gauge height 80. There are two functioning 36-inch diameter outlet slide gates on the face of the outlet works having their inverts approximately eight feet below the existing silt level. A silt catchment fence and depressed rock basin around the outlet structure allows water to flow to the gates with minimal silt flow through the gates.

Loan Feasibility Study

Mike Graber, P.E., Applegate Group, Inc., prepared the Loan Feasibility Study titled "*Cucharas Reservoir No. 5 Dam Rehabilitation Feasibility Study,"* dated March 2009. The study was prepared in accordance with the CWCB guidelines and includes preliminary engineering design and cost estimates.

Additional studies that have been performed in recent years include:

1. Feasibility study by URS Corporation evaluating replacing the existing dam with a new Roller Compacted Concrete Dam (RCC) downstream of the existing dam completed in September 2006.

2. "Evaluation of Yield from Cucharas No. 5 Reservoir" dated December 2005 by Lytle Water Solutions, Bruce Lytle, P.E. with a supplement completed in November 2006.

3. Storage capacity survey work completed in October 2002 – Clyde B. Young & Co.

The Huerfano – Cucharas Irrigation Company

The Company was organized in 1944 as a non-profit mutual ditch company. The Company was formed for the purpose of enhancing agriculture by delivering irrigation water to shareholders. The Company has the power to take on debt and to pledge collateral. Five Directors are chosen annually from the 47 shareholders at the annual meeting. There are presently 5,932 shares assessed at $10.00 per share. Assessments are voted on by the majority of shares at the annual meeting (or special assessment meeting). The Company may place a lien on delinquent stock payments and stop delivery of water. The Company may sell qualified delinquent stock in order to pay for back assessments.

Water Rights

The Company has direct flow rights and reservoir storage rights as shown in Table 1:

Table 1. Water Rights

Name	Amount	Adjudication Date	Priority Date	Decreed Use	Water Source
Huerfano Valley Ditch	42 cfs	2/23/1898	2/2/1888	Irrigation	Huerfano River
Huerfano Valley Ditch	18 cfs	10/3/1921	2/23/1898	Irrigation	Huerfano River
Huerfano Lake	2,017 AF	2/23/1898	2/2/1888	Irrigation	Huerfano River
Cucharas Reservoir	31,958 AF (absolute)	10/3/1921	3/14/1906	Irrigation	Cucharas River
Cucharas Reservoir	35,404 AF (conditional)	10/3/1921	3/14/1906	Irrigation	Cucharas River

Based on the Lytle Water Solutions report, the Company irrigation demands are regularly greater than the availability, but with a supplemental supply from Cucharas Reservoir, the target demands of 3,000 AF were met in 11 of 24 years.

Project Description

The purpose of this Project is to prevent a zero storage restriction from being imposed and to maintain at least some storage in the Reservoir.

Alternative No. 1 – No-action: The SEO has placed a deadline of October 1, 2010 to either rehabilitate the existing dam, build a new one, or a zero no-storage restriction will be imposed followed by an order to breach the dam and remove the hazard it represents. The no-action alternative has a significant cost associated with the breaching of the dam and effectively shows intent to abandon a viable and valuable storage right. This is an unacceptable alternative because of the high cost and no benefit associated with this action.

Alternative No. 2 - Sediment removal in conjunction with dam repair: In the 2006 feasibility report by URS, it was estimated that over eight million cubic yards of deposited sediment exist in the Reservoir basin. This equates to roughly 500 AF of lost storage. The determination was made that the costs, environmental concerns and required permitting made removal of the sediment unfeasible.

Alternative No. 3 - Construct a new RCC dam downstream of the existing dam: This was the recommended alternative of the 2006 URS feasibility report and remains a long-term goal of the Company. The estimated $30 million price tag of this alternative is beyond the current financial capability of the Company.

Alternative No. 3 - Rehabilitate the existing dam to allow full reservoir storage: Preliminary cost estimates associated with rehabilitating the existing dam to restore full Reservoir storage indicate that this alternative would have a greater cost than construction of a new RCC dam downstream of the existing dam. For this reason, no further evaluation of this alternative was considered.

SELECTED ALTERNATIVE No. 4 - Lower the emergency spillway to allow storage at a reduced storage level: The selected alternative is to structurally lower the existing emergency spillway, permanently limiting the reservoir storage capacity to a level that will safely pass the SEO required inflow design flood.

Since the initial feasibility study, the SEO has promulgated new Rules and Regulations for Dam Safety and Dam Construction that allow reductions in Probable Maximum Precipitation (PMP) values for altitude and the use of a site specific weather model developed by the SEO for high altitude precipitation. Based on the new permitted reductions in PMP values, it is feasible to permanently lower the existing spillway to an elevation that could safely route the required inflow design flood. There is sufficient elevation difference between the existing concrete spillway, the Reservoir basin and the rock cut spillway discharge channel to lower the emergency spillway 25 vertical feet. This elevation roughly corresponds to the current restricted storage level of gauge height 100. Lowering the spillway to this level would produce 57,000 acre-feet of flood routing storage and significantly increase the spillway capacity. The goal would be to only lower the spillway to an elevation that could safely pass the required inflow design flood and maintain as much Reservoir storage as possible. This alternative is expected to maintain approximately 7,500 AF of storage.

While there are significant structural issues with the present dam embankment that make permanent Reservoir storage at higher elevations not feasible, the dam has performed adequately for the past twenty years at the current restricted level of gauge height 100. No additional embankment consolidation or displacement has been measured and only minor increases in seepage have been noted at the maximum restricted storage level. Permanently lowering the spillway and restricting the maximum storage level could have an additional benefit by reducing the hazard classification from high to significant hazard.

This Project will include the following items:

1. A hydrologic model will be developed to determine at what elevation the lowered spillway can safely pass the inflow design flood with adequate freeboard.
2. An analysis will be completed to determine if there are structural concerns relating to the proposed Reservoir storage level.
3. Plans and specifications will be developed for lowering the existing spillway.
4. A dam break model and dam break inundation map will be developed to verify the dam hazard class based on the reduced Reservoir storage level and for use in the updated Emergency Action Plan.
5. Replacement of the two 30-inch diameter outlet gates.
6. A monitoring program will be implemented that will transmit data (weather information, inflow, outflow, Reservoir level, and seepage measurement) at regular intervals via the SEO satellite monitoring system.
7. An updated Emergency Action Plan will be developed for the newly configured dam and Reservoir.
8. The irrigation delivery system will also be updated with new gates and repair on the river diversion

Table 2. Cost Estimate

Engineering	$265,000
Construction	
Spillway Modifications	$225,000
Sluice Gate Replacement	$160,000
Stability/Seepage Control Berm	$358,000
Monitoring and Instrumentation	$115,000
Irrigation System Improvements	$160,000
Mobilization	$64,000
Construction Observation	$64,000
Testing	$26,000
Survey	$26,000
Contingency	$321,000
TOTAL	**$1,784,000**

Pending SEO plan approval, Project construction is expected to begin during the winter of 2009/2010.

Financial Analysis

Table 3 shows a summary of the financial aspects of the loan request. The interest rate is based on the standard agricultural interest rate of 2.5% for a 30 year term per Financial Policy #7.

Table 3. Financial Summary

Total Project Cost	$1,784,000
CWCB Loan Amount	$1,606,000
CWCB Loan Amount (Including 1% Service Fee)	$1,622,060
CWCB Loan Payment	$77,500
CWCB Loan Payment (Including 10% Reserve)	$85,250
Borrower 10% Contribution	$178,000
Current Assessment per share	$10
Annual cost of loan per share	$14
Future (with Project) Assessment per share	$24
One Time Assessment for 10% Borrower Contribution	$30

Creditworthiness: The Company currently has no debt. Repayment of the loan will be accomplished utilizing shareholder assessments. The current assessment is $10 per share. The increase of $14 per share will result in annual assessments of $24 per share. The Company's 10% match will come from a one-time assessment of $30 per share.

Table 4. Financial Ratios

Financial Ratio	Past Years	Future
Operating Ratio (revenues/expenses) weak: <100% - average: 100% - 120% - strong: >120%	150% (Strong) $60K/40K	117% (Average) $146K/125K
Debt Service Coverage Ratio (revenues-expenses)/debt service weak: <100% - average: 100% - 120% - strong: >120%	N/A (No ex. debt service)	125% (Strong) $146-40K/85K
Cash Reserves to Current Expenses weak: <50% - average: 50% - 100% - strong: >100%	85% (Average) $34K/40K	27% (Weak) $34K/125K
Annual Operating Cost per Acre-Foot (3,000 AF) weak: >$20 - average: $10 - $20 - strong: <$10	$13/AF (Average) $40K/3K AF	$42/AF (Weak) $125K/3K AF

Collateral - Security for the loan shall be the Company's pledge of assessment revenues backed by a rate covenant and annual financial reporting and the water rights in Huerfano Valley Ditch and Huerfano Lake as noted in Table 1. This is in compliance with CWCB Financial Policy #5 (Collateral).

Staff Recommendation

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Additional contract condition: The CWCB will not disburse funds until the SEO has approved the Project.

Email copy: Mike Rinks, President Huerfano-Cucharas Irrigation Company
Mike Graber, P.E., Applegate Group, Inc.
Susan Schneider, AGO

Attachment: Water Project Construction Loan Program – Project Data Sheet

CWCB Construction Loan Program
Project Data Sheet

Borrower: Huerfano-Cucharas Irrigation Co. **County**: Pueblo/ Huerfano

Project Name: Cucharas Reservoir Rehabilitation **Project Type:** Reservoir Rehabilitation

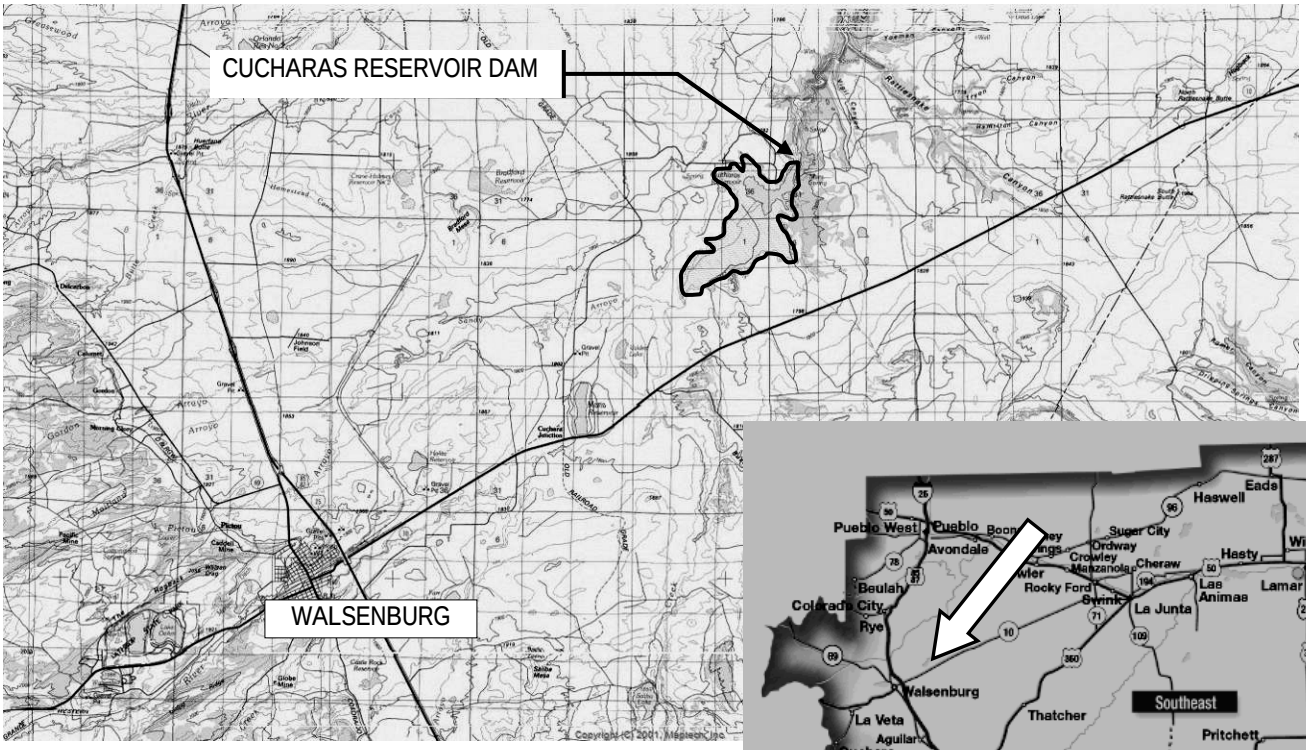
Drainage Basin: Arkansas **Water Source**: Cucharas River

Total Project Cost: $1,784,000 **Funding Sources:** STTFPBA

Type of Borrower: Agricultural **Average Delivery:** 3,000 acre-feet
New Storage: 7,500 AF (Restricted)

Loan: $1,622,060 (Including 1% fee) **Interest Rate:** 2.5% **Term:** 30 years

The Huerfano-Cucharas Irrigation Company (Company) provides irrigation water to farmers in the Arkansas valley. The Company was organized in 1944 and currently has 47 shareholders. The Company owns and operates the Cucharas Reservoir, located east of Walsenburg. The dam is a 145-foot high rock fill dam that has undergone several enlargements since the original construction in 1914. The reservoir has a capacity of 35,395 acre-feet. A storage restriction has been in place since 1988 with a deadline of October 1, 2010, imposed by the SEO either to rehabilitate the existing dam, replace it with a new dam or a zero no-storage restriction will be imposed followed by an order to breach the dam and remove the hazard it represents. The Company plans to rehabilitate the existing dam to allow a reduced level (7,500 AF) of storage. The Project involves lowering the spillway, replacing outlet gates, installing a satellite monitoring system, and updating a new Emergency Action Plan. Pending SEO plan approval, project construction is expected to begin during the winter of 2009/2010.



LOCATION MAP