

STATE OF COLORADO

Colorado Water Conservation Board Department of Natural Resources

1313 Sherman Street, Room 721
Denver, Colorado 80203
Phone: (303) 866-3441
Fax: (303) 866-4474
www.cwcb.state.co.us



TO: Colorado Water Conservation Board Members

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

DATE: May 12, 2009

SUBJECT: **Agenda Item 17c, May 19-20, 2009 Board Meeting**
Water Supply Planning and Finance Section – New Project Loans
Joseph W. Bowles Reservoir Company – Bowles No. 1 Dam Rehabilitation Project

Bill Ritter, Jr.
Governor

Harris D. Sherman
DNR Executive Director

Jennifer L. Gimbel
CWCB Director

Dan McAuliffe
CWCB Deputy Director

Introduction

The Joseph W. Bowles Reservoir Company (Company) is applying for a \$1,687,000 loan from the CWCB to construct its Bowles No. 1 Dam Rehabilitation Project (Project). The purpose of this Project is to implement several repairs and improvements to correct dam-safety deficiencies and improve the long-term performance of the Bowles No. 1 Dam so that the full storage capacity of Bowles No. 1 Reservoir (Reservoir) is preserved. Additionally, the deteriorating inlet ditch to the Reservoir will be rehabilitated to regain its full capacity. The estimated total cost of the project is \$1,874,000. See the attached Project Data Sheet for a location map and project summary.

Staff Recommendation

Staff recommends the Board approve a loan not to exceed \$1,703,870 (\$1,687,000 for project costs and \$16,870 for the 1% Loan Service Fee) to the Joseph W. Bowles Reservoir Company to construct its Bowles No. 1 Dam Rehabilitation Project from the Construction Fund. The loan terms shall be 30 years at a blended interest rate of 4.65% per annum. Security for the loan shall be in compliance with CWCB Financial Policy #5.

Background

The Reservoir is owned and operated by the Joseph W. Bowles Reservoir Company. The Reservoir is located in the southwest metropolitan area of Denver, Colorado, southeast of the intersection of West Belleview Avenue and South Wadsworth Blvd. It is bordered by Marston Reservoir on the north. The Reservoir is situated within the jurisdictions of the City of Lakewood and the City and County of Denver. The Company owns the dam and Reservoir, and has easements for its inlet ditch and several outlet ditches used for delivery of water to its shareholders.

The Reservoir is off channel, and draws its water supply from Bear Creek near the Town of Morrison. Water is conveyed first through the Harriman Ditch to the vicinity of Harriman Reservoir by Denver Water, and then through the inlet ditch to the Reservoir. Additional water supplies are conveyed from Bear Creek through the Reservoir to three other reservoirs on the Bowles system. The inlet ditch to the Reservoir is also used to convey direct flow and storage water to other entities under an operations and maintenance agreement.

Historically, the Reservoir water was used for irrigation of crops and pastures in the vicinity of the Reservoir. The current primary uses for the Reservoir include irrigation of the Grant Ranch Development parks and streetscape areas, irrigation supply for two golf courses (public and private), irrigation of pasture grass for a number of private residences and small ranches, and for recreational uses. The acreage served by the Reservoir is estimated to be approximately 400 acres.

The dam was originally constructed around 1876, and is classified as a Significant Hazard structure. Based on the State Engineer's Office (SEO) records, the dam embankment has a maximum height of about 15 feet and a crest length of about 6,000 feet. The embankment is divided into an east dam and a west dam. Appurtenant structures historically consisted of a spillway on the southwest side of the Reservoir, and two outlet works (east and west outlet works). The spillway was modified in 1997, the east outlet works was rehabilitated in 1998 and the west outlet works was abandoned in 2007. The storage capacity of the Reservoir is estimated at 2,062 acre-feet (AF).

The Company intends to address several repairs with this Project. The primary concern with the dam is the continual deterioration of the upstream slope developing into near vertical slopes due to inadequate slope protection. A second component of the Project is to reconstruct a section of the inlet ditch that has seen urban development encroach up to the edges of its banks and where urban storm runoff discharges intercepted by the ditch have increased, causing bank erosion and creating the potential for ditch overflow and damage to adjacent properties. The ditch Project is located in an urban area where cottonwood and willow trees have grown into the ditch, causing ditch safety concerns.

This Project is important to the Company so that it can ensure uninterrupted water supplies for the shareholders that are dependent upon the Reservoir and to preserve the storage capacity of the Reservoir for recreation, wildlife and neighborhood aesthetics.

Feasibility Studies

The Loan Feasibility Study was prepared by Judy Simonson, Manager/Secretary/Treasurer of the Company with technical assistance from James Ferentchak, P.E., of W.W. Wheeler and Associates, Inc. The study was prepared in accordance with the CWCB guidelines and includes an alternative analysis, engineering design and cost estimates.

In addition, the Company commissioned two recent studies of the dam. In 2006, the Company commissioned Basepoint Design, a geotechnical engineering firm, to provide an independent dam-safety review and inspection of the dam. In 2007, the Company retained Kumar and Assoc., Inc., geotechnical engineers, to prepare a geotechnical study and subsurface investigation with respect to seepage and slope stability, and to develop technical recommendations for proposed improvements to the dam. Results and recommendations of these investigations were incorporated into the loan feasibility study.

Joseph W. Bowles Reservoir Company

The Company is a mutual ditch and reservoir corporation organized under the laws of the State of Colorado. The Company was formed in 1906. The Company is managed by a five-member board of directors. The board has the power to incur indebtedness and to enforce the payment of all assessments. The board has the authority to make assessments on stock with shareholder approval. The Company's bylaws also permit it to foreclose on shareholders with delinquent assessments. Currently there are 424.26 shares of stock held by stockholders. Ownership of these shares is a mix of individual home owners, commercial interests, parks and recreation and metropolitan districts.

Water Rights

The water rights for the Reservoir were decreed as part of the Bowles Reservoir System. The system is made up of four reservoirs: Bowles No. 1 Reservoir, Patrick/Bennett Lake, Upper Tule Lake and Lower Tule Lake. The water rights, as noted in Table 1, were decreed as part of an overall operating system between all four of these reservoirs. In 1985, the Patrick/Bennett Reservoir Company was formed as a spinoff of the Joseph W. Bowles Reservoir Company. Patrick/Bennett Reservoir Company owns and operates Patrick/Bennett Lake, Upper Tule Lake and Lower Tule Lake. The Bowles No. 1 Reservoir has a defined storage capacity and a pro rata interest in the original storage diversion decrees.

Table 1. Water Rights

Water Right Use	Appropriation Date	Adjudication Date	Amount	Bowles No. 1 Capacity	Decreed Use
All Bowles Systems Reservoirs	5/10/1876	2/4/1884	11.06 cfs	2,110.5 AF	Irrigation
All Bowles Systems Reservoirs	5/15/1880	2/4/1884	15.75 cfs	2,110.5 AF	Irrigation
Joseph W. Bowles No. 1 Reservoir Enlargement	3/9/1883	9/24/1935	33.19 cfs	362.56 AF	Irrigation

The Reservoir has the second-most senior reservoir storage decree on the main stem of Bear Creek and down the South Platte River to the state line. As such, it is generally expected to fill each year. Records show that the Reservoir is filled to or near maximum capacity during most years and undergoes moderate drawdown each year. The net yield released from the Reservoir to shareholders has historically averaged about 2.2 acre-feet per share (or roughly 900 AF).

Project Description

While the Reservoir is not currently operating under a fill restriction, the Company wants to complete this Project to correct dam-safety deficiencies and to rehabilitate the deteriorating inlet ditch to the Reservoir. Three alternatives were considered for this Project:

1. The no-action alternative;
2. Dam rehabilitation and ditch rehabilitation;
3. Dam reconstruction and ditch rehabilitation.

Alternative No. 1 - This alternative was considered unacceptable because it is expected that the SEO would eventually impose a storage restriction on the dam, thereby affecting future water use and storage.

Selected Alternative No. 2 –This alternative would include widening the crest, reconstructing the upstream slope, and installing a seepage collection and toe drain system on the downstream slope. Work on the inlet ditch includes removing trees, reconstructing the ditch cross section and alignment, placing slope protection in high erosion areas, and installing a flow control pipe that will provide for discharge of excessive ditch flows into an existing spillway and drainage structure. The cost for this alternative is estimated to be \$1,874,000.

Alternative No. 3 – This alternative would require full removal and complete rebuilding of the dam. The new dam would be similar in cross section to Alternative No. 2. The inlet work would also be the same as listed in Alternative No. 2. The cost for this alternative is estimated to be \$3,020,000.

The Company has chosen Alternative No. 2 because it appears to be the best of the three proposed alternatives to improve the dam-safety deficiencies identified by the SEO and to repair the inlet ditch within a reasonable budget.

**TABLE 2
PROJECT COST**

Construction	
Dam Repair	\$ 1,443,000
Ditch Repair	\$ 118,000
Engineering	\$ 313,000
TOTAL	\$ 1,874,000

The Project schedule is as follows: final design complete by January 2010, SEO approval by May 2010, construction beginning in August 2010, with the Project expected to be operational by March 2011.

Financial Analysis

The Company shareholders are a mix of 5% agricultural, 37% middle-income municipal, 16% high-income municipal, and 42% commercial interest. Blending these with the current interest rates, the Company qualifies for a 4.65% loan with a 30-year term.

**TABLE 3
FINANCIAL SUMMARY**

Total Project Cost	\$1,874,000
CWCB Loan Amount	\$1,687,000
CWCB Loan Amount (Including 1% Service Fee)	\$1,703,870
CWCB Loan Payment	\$106,457
CWCB Loan Payment (Including 10% Reserve)	117,102
Current Assessment per share	\$500
Cost of Loan (with Reserve Account) per share	\$276

Creditworthiness: The Company has no existing debt service. The CWCB loan will be repaid from increases in share assessments. For the past several years, the Company's assessments have been \$500/share. While the cost of the CWCB loan per share is \$276/share, assessments will only have to be raised by approximately \$240/share for the first year and \$180/share for the remainder of the loan. This is because the Company has been assessing shareholders for other maintenance projects and assessments would have decreased if the Company had not chosen to pursue this Project. The Company believes this Project will reduce maintenance costs, therefore, ultimately providing cost savings for its shareholders.

The Company has already raised 10% in cash (\$187,400) from capital assessments that were generated in anticipation of the Project.

TABLE 4
FINANCIAL RATIOS

Financial Ratio	Past 2 Years	Future w/ Project
Operating Ratio (revenues/expenses) weak: <100% - average: 100% - 120% - strong: >120%	102% (Average) \$278K/272K	102% (Average) \$395K/389K
Debt Service Coverage Ratio (revenues-expenses)/debt service weak: <100% - average: 100% - 120% - strong: >120%	No Existing Debt	105% (Average) \$395-272K/ 117K
Cash Reserves to Current Expenses weak: <50% - average: 50% - 100% - strong: >100%	79% (Average) \$215K/272K	7% (Weak) \$28K/389K
Annual Operating Cost per Acre-Foot (900 AF) weak: >\$20 - average: \$10 - \$20 - strong: <\$10	\$169 (Weak) \$152K/900 AF	\$242 (Weak) \$218K/900 AF

Collateral: As security for the loan, the Company will pledge its assessment revenues backed by a rate covenant and annual financial reporting. This is in compliance with CWCB Financial Policy #5 (Collateral).

Staff Recommendation

Staff recommends the Board approve a loan not to exceed \$1,703,870 (\$1,687,000 for project costs and \$16,870 for the 1% Loan Service Fee) to the Joseph W. Bowles Reservoir Company to construct its Bowles No. 1 Dam and Inlet Ditch Project from the Construction Fund. The loan terms shall be 30 years at a blended interest rate of 4.65% per annum. Security for the loan shall be in compliance with CWCB Financial Policy #5.

cc: Judy Simonson, Secretary/Treasurer, Joseph W. Bowles Reservoir Company
James Ferentchak, P.E., W.W. Wheeler & Associates
Susan Schneider, AGO

Attachment: Project Data Sheet

CWCB Construction Loan Program Project Data Sheet

Borrower: Joseph W. Bowles Reservoir Company **County:** Jefferson

Project Name: Bowles Reservoir No. 1 Dam Rehab **Project Type:** Reservoir Rehabilitation

Drainage Basin: South Platte

Water Source: Bear Creek

Total Project Cost: \$1,874,000

Funding Sources: Construction Fund

Type of Borrower: Blended Ag & Municipal
& Commercial

Average Delivery: 900 AF

Loan Amount: \$1,703,870 (Including 1% fee)

Interest Rate: 4.65%

Term: 30 years

The Joseph W. Bowles Reservoir Company (Company) owns and operates Bowles No. 1 Reservoir, located in the southwest metropolitan area of Denver. The Company was formed in 1906 and currently has 50 shareholders who use the water for golf courses, parks, open space, and some individual ranches for irrigation water. The Company is applying for a loan to implement several repairs to correct dam-safety deficiencies and improve the long-term performance of Bowles No. 1 Dam and to rehabilitate the deteriorating reservoir inlet ditch. The dam rehabilitation includes widening the crest, reconstructing the upstream slope, and installing a seepage collection and toe drain system on the downstream slope. Work on the inlet ditch includes removing trees, reconstructing the ditch cross section and alignment, placing slope protection in high erosion areas, and installing a flow control pipe that will provide for discharge of excessive ditch flows into an existing spillway and drainage structure. The Company plans on submitting the final design to the SEO by February 2010 and beginning construction in August 2010 with completion by February 2011.

