



**COLORADO**

**Colorado Water  
Conservation Board**

Department of Natural Resources

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**TO:** Colorado Water Conservation Board Members

**FROM:** Jonathan Hernandez, P.E., Project Manager  
Kirk Russell, P.E., Finance Section Chief

**DATE:** January 25-26, 2016 Board Meeting

**AGENDA ITEM:** 18b. Water Project Loans  
Lake McIntosh Reservoir Company - Lake McIntosh Outlet Works Repair

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### Introduction

The Lake McIntosh Reservoir Company (Company) is applying for a loan for the Lake McIntosh Outlet Works Repair (Project). In May 2015, a section of the Lake McIntosh's outlet pipe collapsed, creating a sink hole and rendering the outlet works nonfunctional. The purpose of the Project is to restore Lake McIntosh's functionality by repairing the damaged outlet pipe. The total Project cost is estimated to be \$1,900,000. The Company is requesting a loan from CWCB for approximately 90% of the Project Cost. See attached Project Data Sheet for a location map and Project summary.

### Staff Recommendation

Staff recommends the Board approve a loan not to exceed \$1,727,100 (\$1,710,000 for Project costs and \$17,100 for the 1% service fee) to the Lake McIntosh Reservoir Company for costs related to the Lake McIntosh Outlet Works Repair Project from the Construction Fund. The loan terms shall be 30 years at a blended interest rate of 2.70% per annum. Security for the loan shall be in compliance with CWCB Financial Policy #5.



## Background

The Company is located in Boulder County and operates Lake McIntosh (Reservoir) for the benefit of its shareholders. The Reservoir is a supplemental supply storage reservoir for shareholders of the Highland Ditch Company. Prior to the formation of the Company in 2001, the Reservoir was owned and operated by the Highland Ditch Company. To this day, shareholders of the Company are also shareholders of Highland Ditch Company because, with the exception of the City of Longmont's changed shares, storage water can only be used in an exchange to the Oligarchy Ditch for direct flow water to the Highland Ditch Company. The City of Longmont uses water from the Reservoir to irrigate city open space and parks under the Oligarchy Ditch's service area.

The Reservoir is located in Boulder County and has a storage capacity of approximately 2,476 AF. It was constructed in 1890 and enlarged in 1902. The Reservoir's inlet is a lateral off the Oligarchy Ditch. The outlet is located on the east side, opposite of the dam embankment and spillway, and is situated so water is discharged by gravity into the Oligarchy ditch. The outlet works pipe system is approximately 3,300 LF and is constructed of multiple types of pipe. The first section is 200 LF of 54-inch corrugate metal pipe (CMP). The second section is 790 LF of two 24-inch vitrified clay pipe (VCP), and the final section is 2,310 LF of 48-inch reinforced concrete pipe (RCP).

When the Company was rehabilitating the outlet's intake structure in 2010, it was noted that the VCP pipe section may need replacement soon as the pipes were observed to be extensively cracked and in danger of collapsing. In May 2015 a section of the VCP pipes did collapse, creating a sinkhole that deposited soil in the outlet works pipes downstream for approximately 300 feet. This has rendered the outlet unusable and thus water cannot be delivered without the use of a temporary pump.

## Loan Feasibility Study

Glen Church, P.E., of Deere & Ault Consultants, Inc., prepared the Loan Feasibility Study, titled "Lake McIntosh Reservoir Company Outlet Works Repair - Feasibility Report," dated November 25, 2015. The feasibility study was prepared in accordance with the CWCB guidelines and includes an analysis of alternative, preliminary engineering design, and construction cost estimates.

## Borrower - Lake McIntosh Reservoir Company

The Company is a Colorado for-profit mutual irrigation reservoir company, incorporated in 2001. Upon formation, shareholders of the Highland Ditch Company received 4 reservoir shares for every ditch share. The Company currently has 248 shareholders and 2,816 shares of stock. Since formation, the Company's revenues have been primarily derived from a City of Longmont recreation lease on the lake. The Company is in good standing with the Colorado Secretary of State.

The Company's By-Laws (2001) provide the five-member Board of Directors with corporate powers of the Company and the authority to set assessments. The By-Laws also provide the authority to enforce unpaid assessments by selling delinquent stock shares.

## Water Rights

The water rights of the Company include:

TABLE 1: WATER RIGHTS

Name	Amount	Appropriation Date	Adjudication Date	Water Court Case No.
McIntosh Res	2,460 AF	10/8/1902	3/13/1907	CA4790
McIntosh Res ( <i>Refill</i> )	2,460 AF	12/31/1929	7/23/1951	CA11715

The Reservoir is operated pursuant to an exchange decreed in W-8715-77 where senior water which the

Oligarchy Ditch is entitled to is instead diverted into the Highland Ditch. Concurrently, the same amount of water is released from the Reservoir to the Oligarchy Ditch in exchange. On average, the Company delivers 1,533 AF per year to its shareholders.

### **Project Description**

The goal of this Project is to restore the Reservoir's functionality by repairing its damaged outlet works. In discussions with the State Engineer's Office Dam Safety Branch (SEO), it was found that the Reservoir did not meet current outlet works drawdown requirements. For new reservoirs, the SEO requires the outlet works system be able to release the top five feet of the reservoir in five days. The existing outlet works was capable of drawing down the top five feet of the Reservoir in thirteen days. The SEO's position is that any repairs to existing outlet works systems cannot decrease the current drawdown time, while increasing the release capacity towards the five day new reservoir standard is preferred. The following alternatives were considered:

**Alternative 1 - Do Nothing:** This alternative was considered unacceptable. Without a gravity outlet works, shareholders would have to rely on a temporary pumping system to operate the water exchange. Additionally, the Reservoir would not be able to release stored water during an emergency situation which would violate the SEO's requirements, leading to a storage restriction.

**Alternative 2 - Replace 24" VCP, CIPP Liner:** This alternative would seek to repair the damaged VCP pipes with a cured in-place pipe (CIPP) procedure. A hydraulic analysis showed this alternative would reduce the pipe's inside diameter from 24-inches to 23-inches; decreasing the outlet works release capacity. This would violate the SEO's requirements and thus is considered not feasible.

**Alternative 3 - Replace 24" VCP, Pipe Splitting:** This alternative would involve splitting one of the existing 24" VCP pipes and installing a larger diameter HDPE pipe to replace the two VCP pipes. To maintain minimum release capacities a 34-inch HDPE pipe would be needed. The engineer raised constructability concerns in maintaining the precise grade needed and limited room for staging the HDPE pipe. This alternative was considered to be neither economical nor feasible.

**Alternative 4 - Abandon Outlet Works, Install Permanent Pump Station:** Due to the grade of the Oligarchy Ditch and the Reservoir's outlet, the outlet pipe runs 3,300 feet before it catches grade and can discharge into the Oligarchy Ditch by gravity. This alternative would abandon the entire outlet pipe and instead pump up to the ditch by installing a permanent pump station. The construction cost is estimated to be \$4 million dollars without consideration of annual operation and maintenance cost because of the size of pump required to meet the SEO drawdown requirements. This alternative was not selected as it is not economical.

**Alternative 5 - Repair Outlet to Irrigation Capacity, New Emergency Outlet:** This alternative looked at the feasibility of repairing the existing outlet with a smaller pipe to maintain irrigation release capacities, and constructing a new outlet that can provide the SEO required emergency release capacity at a new location. This presented multiple challenges and potentially high costs due to the easements and land acquisitions that would be necessary and the multiple entities that would have to be involved (City of Longmont, Ditch Companies, Parks Department, Homeowners). With uncertain site conditions, cost associated with a new structure, and the required repairs to the existing outlet to maintain releases to Oligarchy Ditch, this alternative was not considered further.

**Selected Alternative 6- Replace 24" VCP, RCP Pipe:** This alternative involves replacing the two 24-inch VCP pipe section, with one 48-inch reinforced concrete pipe (RCP). This pipe type would match the downstream pipe section and be capable of drawing down the Reservoir's top five feet in seven days (88 cfs). This meets the SEO's drawdown requirement as it's the maximum rate that can be

obtained without also replacing 2,310 LF of the existing 48" RCP pipe. The majority of construction will occur through an open cut trench with the exception of portion that is located under Harvard Street and the Platte River Power Authority (PRPA) substation. The presence of the substation will require that approximately 150 LF be hand tunneled so the PRPA's conduits can remain in place.

The cost associated with this alternative is \$1,900,000 as shown in Table 2.

**TABLE 2: PROJECT COST**

Task	COST
Design Engineering	\$200,000
Permitting	\$100,000
Construction	\$1,200,000
Construction Management	\$100,000
Contingency	\$300,000
<b>TOTAL</b>	<b>\$1,900,000</b>

**Permitting:** The Company is in discussion with the US Army Corps of Engineers to determine if the project will be permitted through a Nationwide 3 Permit, of if it will qualify under the Agricultural Exemption. Additionally, City of Longmont permits will be required for impacts to Harvard Street as well as to bike paths, trails, and any underground utility lines.

**Schedule:** Construction is planned to begin in summer 2016 and be completed by winter, prior to the 2017 irrigation season.

#### **Financial Analysis**

The Company qualifies for a blended interest rate of 2.70% for a 30-year term (Ownership: 28% Agricultural, 61% Mid Municipal, 9% High Municipal, 2% Commercial). Table 3 provides a summary of the Project's financial aspects. The Company's 10% contribution will come from design engineering expenses that have already been incurred and cash on hand.

**TABLE 3: FINANCIAL SUMMARY**

Total Project Cost	\$1,900,000
Borrowers Contribution (10%)	\$190,000
CWCB Loan Amount (90%)	\$1,710,000
CWCB Loan Amount (Including 1% Service Fee)	\$1,727,100
CWCB Annual Loan Payment	\$84,733
CWCB Annual Loan Obligation (1 <sup>st</sup> Ten Years)	\$93,206
Number of Shares	2816
Annual Loan Obligation per Share	\$33/share
Current Assessment per Share	\$0/share
Future Assessment per Share	\$25/share
Project Cost per Storage Capacity Preserved (2,476AF)	\$767/AF

**Creditworthiness:** The Company has no existing debt. Income from the recreation lease has been sufficient to cover annual expenses and thus shareholders do not currently pay annual assessments. Prior to 2001, annual assessments were collected for this water through the Highland Ditch Company. Although not required by its By-Laws, the Company will obtain a shareholders resolution authorizing this loan in consideration of the need for new shareholder assessments.

**TABLE 5: FINANCIAL RATIOS**

Financial Ratio	Past 3 Years	Future w/ Project
Operating Ratio (revenues/expenses) weak: <100% - average: 100% - 120% - strong: >120%	231% (Strong) \$60K/\$26K	109% (Average) \$130K/\$119K
Debt Service Coverage Ratio (revenues-expenses)/debt service weak: <100% - average: 100% - 120% - strong: >120%	NA	112% (Average) (\$128K-\$26K) \$93K
Cash Reserves to Current Expenses weak: <50% - average: 50% - 100% - strong: >100%	419% (Strong) \$109K/\$26K	58% (Average) \$69K/\$119K
Annual Operating Cost per Acre-Foot (1,533 AF) weak: >\$20 - average: \$10 - \$20 - strong: <\$10	\$17 (Average) \$26K/1,533 AF	\$78 (Weak) \$119K/1,533 AF

**Collateral:** Security for this loan will be a pledge of the Company's assessment revenues backed by an assessment covenant, and an undivided one-hundred percent (100%) interest in Lake McIntosh Dam and Reservoir and all associated appurtenances, rights-of-ways, easements, and the underlying parcel. This is in compliance with the CWCB Financial Policy #5 (Collateral).

cc: Nelson Tipton, President, Lake McIntosh Reservoir Company  
Susan Schneider/Jennifer Mele, Colorado Attorney General's Office

Attachment: Water Project Loan Program - Project Data Sheet

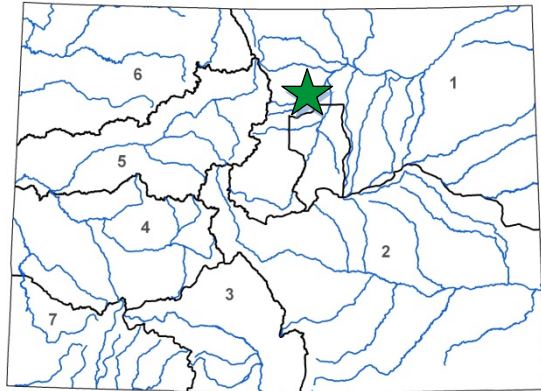


## Lake McIntosh Outlet Works Repair

Lake McIntosh Reservoir Company

January 2016 Board Meeting

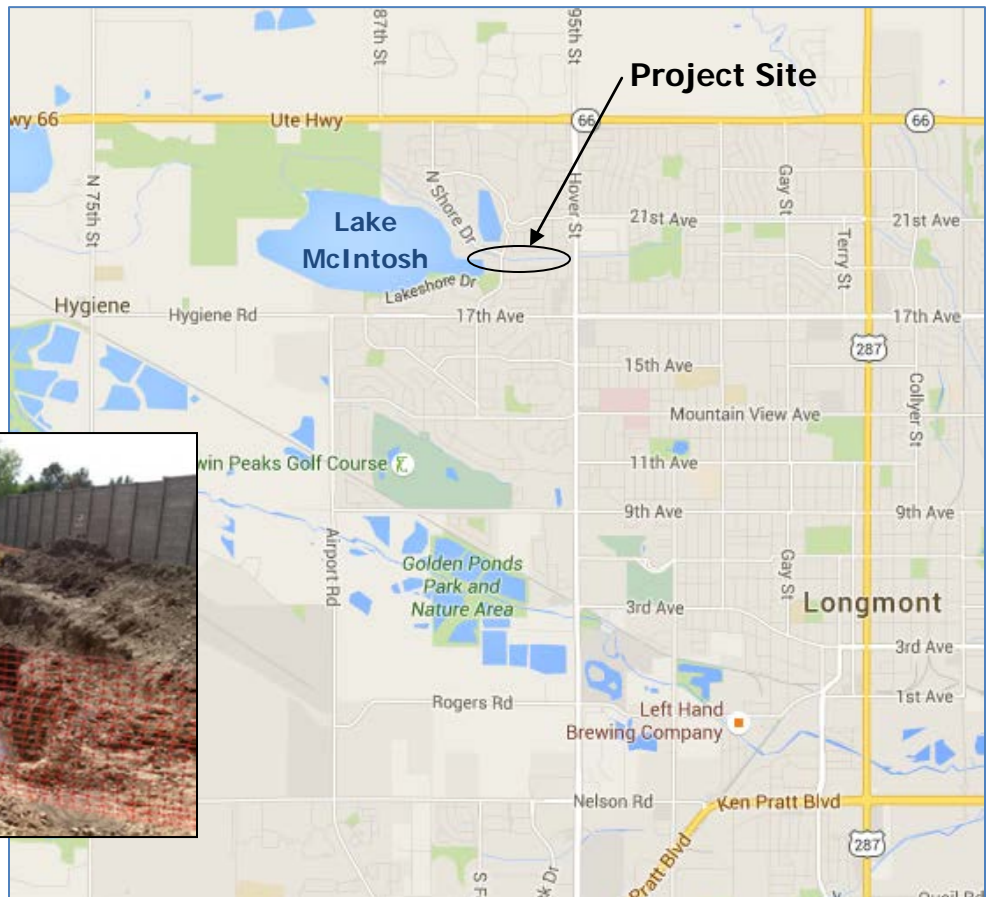
L O A N   D E T A I L S	
Project Cost:	\$1,900,000
CWCB Loan (with Service Fee):	\$1,727,100
Loan Term and Interest Rate:	30 Years @ 2.70%
Funding Source:	Construction Fund
B O R R O W E R   T Y P E	
Agriculture	Municipal
28%	0 % Low - 61% Mid - 9% High
	Commercial
	2 %
P R O J E C T   D E T A I L S	
Project Type:	Reservoir Rehabilitation
Average Annual Delivery:	1,533 AF
Storage Preserved:	2,476 AF



L O C A T I O N	
County:	Boulder
Water Source:	St. Vrain Creek
Drainage Basin:	South Platte River
Division:	1
District:	5

Lake McIntosh Reservoir Company is a mutual irrigation reservoir company formed in 2001. The Company owns Lake McIntosh Reservoir which is used as part of an exchange between the Highland Ditch Company and the Oligarchy Ditch Company.

The reservoir was constructed in 1890 and enlarged in 1902. In May 2015, a section of the reservoir's outlet pipe collapsed, creating a sinkhole which deposited soil in the outlet works pipes downstream for approximately 300 feet. This has rendered the reservoir's outlet works unusable and thus water cannot be delivered without the use of a temporary pump. The goal of this project is to restore the reservoir's functionality by repairing its damaged outlet works. Construction is planned to begin in summer 2016 and completed by winter, prior to the 2017 irrigation season.



May 2015 Sinkhole