



**COLORADO**

**Colorado Water  
Conservation Board**

Department of Natural Resources

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**TO:** Colorado Water Conservation Board Members

**FROM:** Rachel Pittinger, P.E., Project Manager  
Kirk Russell, P.E., Finance Section Chief

**DATE:** November 18-19, 2020 Board Meeting

**AGENDA ITEM:** 6c. Water Project Loans  
Lookout Mountain Water District - Upper and Lower Beaver Brook Dam  
Rehabilitation

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**Staff Recommendation:**

Staff recommends the Board approve a loan not to exceed \$3,535,000 (\$3,500,000 for project costs and \$35,000 for the 1% service fee) to the Lookout Mountain Water District for costs related to the Upper and Lower Beaver Brook Dam Rehabilitation, from the Severance Tax Perpetual Base Fund. The loan term will be 30 years at a high-income municipal interest rate of 2.05% per annum. Security for the loan shall be in compliance with CWCB Financial Policy #5.

**Introduction:**

The Lookout Mountain Water District (District) is applying for a loan for the Upper and Lower Beaver Brook Dam Rehabilitation (Project). The existing Lower Beaver Brook Reservoir is a concrete-faced rockfill structure constructed in 1903 and is the District's raw water supply to its domestic water treatment plant. The dam is classified as high-hazard and is under a Compliance Plan with the State Engineer's Office. This loan, District funds and FEMA Pre-Disaster Mitigation grant funding will construct a replacement roller compacted concrete dam with an enlarged spillway in order to protect the downstream communities and reduce storage loss from leakage. Additional work will also include reconstructing the Upper Beaver Brook outlet works and installing a Supervisory Control And Data Acquisition (SCADA) system to optimize operations. A Water Supply Reserve Fund grant approved in September 2020 will go toward the outlet works and SCADA system improvements. Lastly, a tank and pump feed system will be constructed to provide water to the treatment plant and allow water levels to be varied in the Lower Beaver Brook Reservoir. The total Project cost is estimated to be \$7,750,000. See attached Project Data Sheet for a location map and Project summary.



**Borrower - Lookout Mountain Water District:**

The District is a special district, a division of the government of the State of Colorado formed pursuant to the Special District Act, Title 32, Colorado Revised Statutes, and by decree of the District Court in Jefferson County, Colorado. The District was incorporated in 1988. The District is considered a governmental subdivision of the State of Colorado and as a corporate body has all the powers of a public or quasi-municipal corporation, with facilities, services and financial arrangements. The District has approximately 12 miles of main pipeline, and three reservoirs including Upper Beaver Brook Reservoir (397 acre-feet (AF)), Lower Beaver Brook Reservoir (31 AF), and Lookout Mountain Reservoir (101 AF). The average annual diversions are 185 AF.

The District's water system extends from the Upper Beaver Brook Reservoir to the Lookout Mountain Reservoir near the entrance to Buffalo Bill's Grave. The District serves many non-contiguous parcels over the 12-mile supply line including 1,600 residential and commercial customers through Clear Creek and Jefferson Counties. There are a maximum of 560 taps. There are five members of the Board of Directors for the District. The Board of Directors maintains powers, duties and responsibilities, which include the power to incur indebtedness, liabilities and obligations, and to set and enforce the payment of all fees, rates, charges and assessments for the functions, services and facilities provided by the District. The Board has the ability to take on debt. The District's main source of general fund revenues include property tax receipts from the mil levy collected by Jefferson County. The District is authorized by statute to levy property taxes against property within its boundaries.

**Background:**

The District has two reservoirs on Beaver Brook: Upper Beaver Brook Reservoir (also known as the John Roscoe Reservoir at Upper Beaver Brook) and Lower Beaver Brook Reservoir. These reservoirs are located approximately 7 miles northwest of Evergreen, Colorado in Clear Creek County. The Lower Beaver Brook dam is located on Beaver Brook, a tributary to Clear Creek and the South Platte River upstream of Golden, Colorado. The reservoirs and dams are owned by the District. Lower Beaver Brook Reservoir serves as the forebay for the District's water treatment plant. Lower Beaver Brook Dam is a small, high-hazard, concrete-face rockfill dam where dam safety deficiencies have been identified.

Construction of the new concrete dam will mitigate the dam safety deficiencies identified at the existing Lower Beaver Brook Dam by reducing the risk of failure. The new concrete dam will be constructed to current design standards, in conformance with the State Engineer's Office, Colorado Dam Safety Rules and Regulations for Dam Safety and Dam Construction, and will rehabilitate the deficiencies identified at the existing Lower Beaver Brook Dam. The proposed reconstruction will provide a more reliable dam than what currently exists for the District's operations, will maximize water storage for drought protection, and will reduce the risk associated with flooding that may result from a dam failure.

**Loan Feasibility Study:**

Lookout Mountain Water District prepared the Loan Feasibility Study titled, "CWCB Water Project Loan Feasibility Study, Lookout Mountain Water District Infrastructure Improvements," and was received with the loan application dated September 15, 2020. Technical analysis was provided by Mr. Chad Masching, P.E., with GEI Consultants, Inc., and additional support was provided by Martin and Wood Water Consultants, Inc. and Momentum CE Inc. The feasibility study was prepared in accordance with CWCB guidelines and includes an analysis of alternatives and estimated costs. Audited financial statements were provided by Valentine, Seevers and Associates, PC, Certified Public Accountants.

**Water Rights:**

The District has a portfolio of water rights that are decreed for use by the District that are relevant to this Project. Additional water rights are not needed for this Project. The District will comply with the decreed terms and conditions pertaining to Upper and Lower Beaver Brook Reservoirs and conditions to protect the CWCB instream flow water right on Clear Creek. The District's water supplies and water rights that are relevant to the Project are shown in Table 1.

**TABLE 1: WATER RIGHTS**

Name	Amount	Status	Appropriation Date	Adjudication Date	Case No.
Lookout Mountain Reservoir	18.92 AF	absolute	12/31/1903	10/9/1914	CA41340
	82.17 AF	absolute	10/10/1914	5/13/1936	CA60052
Lower Beaver Brook Reservoir	24.16 AF	absolute	12/31/1903	10/9/1914	CA41340
	6.64 AF	absolute	7/29/1917	5/13/1936	CA60052
Upper Beaver Brook Reservoir	257.21 AF	absolute	8/27/1924	5/13/1936	CA60052
	102.0 AF + 38 AF	conditional	12/29/2011	12/9/2013	11CW287
	38.0 AF + 5.8 AF	conditional	12/31/2013	1/27/2015	13CW3179
Golden Pipeline	3.5 cfs	absolute	12/31/1903	10/9/1914	CA41340
Beaver Brook Pipeline	3.13 cfs	absolute	10/1/1917	5/13/1936	CA60052
Lookout Mountain Reservoir Exchange	2.00 (max)	absolute and conditional	12/31/1987	10/1/1992	87CW303, 94CW291

The Lower Beaver Brook Reservoir will be drawn down through releases from the existing outlet works tunnel to a zero pool by a combination of gravity and pumping. After the reservoir is emptied, the Contractor will divert in-priority steam flows and releases from Upper Beaver Reservoir to the water treatment plant via a small cofferdam constructed upstream of the existing Lower Beaver Brook Reservoir. Additional flows will spill over the cofferdam, into the drained reservoir, and will be routed through the outlet tunnel to Beaver Brook.

During construction, the District will not utilize its water rights from North Beaver Brook directly or via exchange. All water in North Beaver Brook will be left in the stream. The District will utilize in-priority water under its Golden Pipeline water right (CA41340) via diversion from Beaver Brook during construction. When this right is out of priority, the District anticipates the exchange of changed Farmers High Line water (Decree 94CW291) and/or the exchange of releases from Lookout Mountain Reservoir (both under Decree 87CW303) to the temporary water treatment plant intake from Beaver Brook. When the exchanges are not possible or are insufficient, the District will release water from Upper Beaver Brook Reservoir to meet its demands. These operations will prevent injury to the instream flow water rights.

For the Upper Beaver Brook Reservoir outlet works, during construction, the contractor has three options including pumping over the Upper Beaver Brook Reservoir Spillway, siphon over the Upper Beaver Brook Reservoir Spillway, or use a small valve and the downstream end of the new HDPE outlet works' lining, after installation of the lining and prior to completion of the upstream intake modifications. The daily water rights accounting will calculate the volume of water owed to Beaver Brook daily based on measurements and call conditions. The District will measure and record the following Upper Beaver Brook Reservoir information daily: inflow, releases, toe drainage, water level in the reservoir, and the administrative call conditions. The contractor will be required to provide outflows through Upper Beaver Brook Reservoir to match or exceed the daily release volume. The releases will ensure that out-of-priority inflows are not retained in storage. Generally, the District can store water in Upper Beaver Brook Reservoir under its storage rights only when local flows and Clear Creek flows are high. At these times, there is typically enough water that storage occurs and the downstream instream flow water right remains satisfied. The District will operate with water commissioner approval and based on stream flow to support the exchanges. The District will conduct these exchanges during construction as allowed by the water commissioner and limited by water availability.

**Project Description:**

The purpose of this Project is to comply with State Engineer's Office, Colorado Dam Safety branch, Compliance Plan for high-hazard dams, improve safety, provide more operational efficiency and reliability of the District's system.

**Alternative 1 - No Action:** Taking no action would put the safety of the public at risk. Additionally, the District's needed water supply improvements would not occur, the risk of failure of the 96-year old Upper Beaver Brook gates would not be addressed and the operational efficiency-reliability would not improve. A three-foot storage restriction would be put on the Lower Beaver Brook Reservoir which would limit the District from providing water to the water treatment plant.

**Alternative 2 - Lower Beaver Brook Reservoir Dam overtopping protection:** This alternative allows the spillway size to be increased, but it would not improve the seepage conditions related to the existing dam. There is additional uncertainty because of unknown conditions with the rock facing. Due to the proximity with the Xcel gas line, this alternative was not considered because the gas line would require relocation. The estimated cost for this alternative is \$1,600,000. This alternative did not address the outlet works on Upper Beaver Brook Reservoir dam either.

**Selected Alternative 3- Upper and Lower Beaver Brook Dam Rehabilitation:** This alternative was selected because it provided a long-term solution, maintain compliance with Colorado Dam Safety, and protect the downstream population from a dam failure scenario. Construction of a replacement RCC dam section to increase the spillway capacity to meet State requirements and increase the designed life expectancy relative to the rehabilitation alternatives. The replacement of the existing dam structure also allows for foundation improvements to reduce overall storage loss due to leakage and realignment of the outlet works. This dam alignment will limit impacts to the existing Xcel pipeline on the left dam abutment. This modification does result in a slight reduction in the reservoir capacity but will significantly limit additional costs associated with moving and replacing the pipeline. A 20,000-gallon storage tank will be installed to minimize the hydraulic constraints and improve operational efficiency. This alternative also includes the installation of SCADA equipment at key points throughout the District's system to minimize non-beneficial releases from Upper Beaver Brook Reservoir that will be funded by the District and the WSRF grant. This would involve water flow measuring stations throughout the system that would acquire realtime flow data, calculate the optimum release from

Upper Beaver Brook Reservoir, target outflow to actuators installed to control Upper Beaver Brook Reservoir’s new outlet gates, adjust the outflow below Upper Beaver Brook Reservoir. The estimated cost for this alternative is approximately \$7,750,000 and is shown in Table 2.

**TABLE 2: ESTIMATED PROJECT COST**

Tasks	Cost
Upper Beaver Brook outlet works and gate	\$200,000
Raw Water Tank and Pump	\$200,000
Lower Beaver Brook Dam	
Engineering/Project Management	\$800,000
Site Work	\$82,500
Water/Erosion/Sediment Control	\$147,500
Dam Construction	\$6,320,000
<b>TOTAL</b>	<b>\$7,750,000</b>

**Permitting:** FEMA flood mitigation projects maintain requirements of the National Environmental Policy Act which includes an evaluation by federal agencies of the potential environmental impacts of a Proposed Action and a consideration of those impacts during the decision-making process. Following completion of the Environmental Assessment (EA), FEMA issued the District a Finding of No Significant Impact (FONSI) and a Record of Environmental Consideration (REC). A 404 permit from the U.S. Army Corps of Engineers (USACE), is anticipated and will be under a Nationwide Permit 3 for currently serviceable structures. The permit application was submitted to the USACE and is anticipated by December 2020. The State Engineer’s Office, Colorado Dam Safety review and approval is anticipated before construction begins. The District has been working closely with Dam Safety on the design of the dam rehabilitation. Construction work and access will occur on property already owned by the District.

**Schedule:** The District anticipates completing the final design of the Project by December 2020. Bidding is anticipated in the early spring of 2021 with the start of construction in May 2021. The District anticipates final completion of the Project by December 2021.

**Financial Analysis:**

Table 3 provides a summary of the Project’s financial aspects. The District qualifies for a high-income municipal interest rate of 2.05% for a 30-year loan (Ownership: 100% High-Income Municipal). All interest rate evaluations are per CWCB Financial Policy #7 (Lending Rate Determination).

**TABLE 3: FINANCIAL SUMMARY**

Project Cost	\$7,750,000
FEMA Pre-Disaster Mitigation Grant	\$3,987,500
District Cash	\$262,500
CWCB Loan Amount	\$3,500,000
CWCB Loan Amount (Including 1% Service Fee)	\$3,535,000
CWCB Annual Loan Payment	\$158,925
CWCB Annual Loan Obligation (1 <sup>st</sup> Ten Years)	\$174,817
Number of Taps	560
Monthly Loan Obligation per Tap	\$26.01

**Creditworthiness:** The District’s general fund has no debt. A Resolution for financing debt associated with this Project was passed in September 2020. This debt will be repaid by the existing mill levy. The

District also maintains debt under their Water Enterprise Fund. Table 4 summarizes the debt associated with the Water Enterprise Fund.

**TABLE 4: EXISTING DEBT THROUGH THE WATER ENTERPRISE FUND**

Lender	Original Balance	Current Balance	Annual Payment	Maturity Date	Collateral
CWCB C153598	\$600,000	\$72,573	\$39,031	2022	Pledge of Water Revenues
CWCB CT2016-2515	\$2,746,062	\$2,633,421	\$144,667	2048	Pledge of Water Revenues
DOLA Subdistrict A Loan	\$400,000	\$137,226	\$31,696	2024	Pledge of Subdistrict Assessments
<b>Total</b>		<b>\$2,843,220</b>	<b>\$215,394</b>		

**TABLE 5: FINANCIAL RATIOS FOR THE GENERAL FUND**

Financial Ratio	Past Years	Future w/ Project
Operating Ratio (revenues/expenses) weak: <100% - average: 100% - 120% - strong: >120%	187% (strong) \$544K/\$290K	117% (average) \$544K/\$465K
Debt Service Coverage Ratio (revenues-expenses)/debt service weak: <100% - average: 100% - 120% - strong: >120%	n/a	145% (strong) (\$544K-\$290K) \$175K
Cash Reserves to Current Expenses weak: <50% - average: 50% - 100% - strong: >100%	79% (average) \$230K/\$290K	49% (weak) \$230K/\$465K
Debt per Tap (560 taps) <sup>1</sup> weak: >\$5,000 - average: \$2,500 - \$5,000 - strong: <\$2,500	\$5,071 (weak) \$2.84M/560taps	\$11,393 (weak) \$6.38M/560taps
Average Monthly Water Bill <sup>2</sup> weak: >\$60 - average: \$30 - \$60 - strong: <\$30	\$116.23 (weak)	\$116.23 (weak)

<sup>1</sup>Includes all District debt.

<sup>2</sup>Average monthly water bill for Jan-Jul 2020. District include 95% residential, 2% commercial and 3% tax-exempt or municipal customers. The median monthly water bill is approximately \$60/month.

**Collateral:** Security for this loan will be a pledge of general fund revenues. This security is in compliance with the CWCB financial Policy #5 (Collateral).

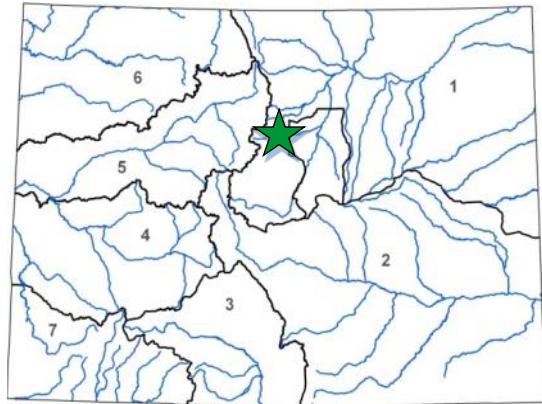
cc: Kyle Schroeder, Treasurer, Lookout Mountain Water District  
 Dean Snyder, Vice President, Lookout Mountain Water District  
 Jennifer Mele, Colorado Attorney General's Office

Attachments: Water Project Loan Program - Project Data Sheet





L O A N   D E T A I L S	
Project Cost:	\$7,750,000
CWCB Loan (with 1% Service Fee):	\$3,535,000
Loan Term and Interest Rate:	30 years @ 2.05%
Funding Source:	Severance Tax Perpetual Base Fund
B O R R O W E R   T Y P E	
Agriculture	Municipal      Commercial
0%	0% Low - 0% Mid - 100% High      0%
P R O J E C T   D E T A I L S	
Project Type:	Dam Rehabilitation
Average Annual Diversions:	185 AF
Storage Preserved:	31 AF



L O C A T I O N	
County:	Jefferson
Water Source:	Beaver Brook
Drainage Basin:	South Platte
Division: 1	District: 7

The Lookout Mountain Water District (District) was created in 1988 to serve a primarily residential area historically served by the City of Golden using their infrastructure. The District serves a 1,600 resident population with approximately 12 miles of pipeline. Three reservoirs provide a total capacity nearly 530 AF.

The existing Lower Beaver Brook Reservoir is a concrete-faced rockfill structure originally constructed in 1903 and is the District’s raw water supply to its domestic water treatment plant just downstream of the dam. The dam is classified as high-hazard and is under a compliance plan with the State Engineer’s Office. The loan, in combination with FEMA Pre-Disaster Mitigation grant funding, will construct a replacement roller compacted concrete (RCC) dam with an enlarged spillway in order to protect the downstream population and reduce storage loss from leakage. The Project will also include modifying the Upper Beaver Brook outlet works to provide water to the treatment plant during construction and install a SCADA system to optimize operations. A Water Supply Reserve Fund grant for \$150,000 was approved in the September 2020 CWCB meeting. Construction is expected to begin early spring of 2021.

