COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Plan

Water Project Summary

Name of Applicant	Dolores Water Conservancy District
Name of Water Project	Dolores Operations Model Modernization
Grant Request Amount	**$182,369.20**
Primary Category	$182,369.20
Agricultural Projects	
Total Applicant Match	**$70,331.80**
Applicant Cash Match	$45,000.00
Applicant In-Kind Match	$25,331.80
Total Other Sources of Funding	**$0.00**
Total Project Cost	**$252,701.00**

Applicant & Grantee Information

Name of Grantee: Dolores Water Conservancy District
Mailing Address: 60 S. Cactus St
PO Box 1150 Cortez CO 81321

Organization Contact: Ken Curtis
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Organization Contact - Alternate: Eric Sprague
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Grant Management Contact: Ken Curtis
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Grant Management Contact - Alternate: Eric Sprague
Position/Title: Water Specialist
Phone: 9708822164
Email: esprague@doloreswater.com

Description of Grantee/Applicant

DWCD operates the Reclamation Dolores Project in SW Colorado, Montezuma and Dolores Counties.

Type of Eligible Entity

- ☐ Public (Government)
- ■ Public (District)
- ☐ Public (Municipality)
- ☐ Ditch Company

- ☐ Private Incorporated
- ☐ Private Individual, Partnership, or Sole Proprietor
- ☐ Non-governmental Organization
- ☐ Covered Entity
- ☐ Other

Category of Water Project

- ■ Agricultural Projects
  Developing communications materials that specifically work with and educate the agricultural community on headwater restoration, identifying the state of the science of this type of work to assist agricultural users among others.
- ☐ Conservation & Land Use Planning
  Activities and projects that implement long-term strategies for conservation, land use, and drought planning.
- ☐ Engagement & Innovation Activities
  Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website.
- ☐ Watershed Restoration & Recreation
  Projects that promote watershed health, environmental health, and recreation.
- ☐ Water Storage & Supply
  Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity and Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap.

Location of Water Project

Latitude	37.577207
Longitude	-108.571704
Lat Long Flag	Reservoir location: Coordinates based on location of reservoir
Water Source	McPhee Reservoir, Dolores River
Basins	Southwest
Counties	Montezuma; Dolores; San Miguel; La Plata
Districts	32-McElmo Creek Basin; 71-West Dolores Creek/Tribs.

Water Project Overview

Major Water Use Type	Agricultural
Type of Water Project	Planning
Scheduled Start Date - Design	6/1/2025
Scheduled Start Date - Construction	

Description

The Dolores Water Conservancy District (DWCD) manages McPhee Reservoir, which is operated to meet multiple objectives including irrigation contracts, environmental flows, boating on the Dolores River, municipal water supply, and flood control. In this project, DWCD will oversee a contractor to conduct various software development activities to upgrade the existing DWCD Excel-based operations planning tool to a modern water resources model using the GoldSim software package. This upgraded model will integrate ensemble streamflow forecasts from the Colorado Basin River Forecast Center, and Colorado Airborne Snow Measurement programs to allow for more efficient decision-making during runoff season and maximize the beneficial use of McPhee Reservoir. DWCD will engage with local stakeholder agencies representing a broad range of water sector interests to ensure that the final operational tool will allow DWCD to develop and disseminate operating plans

quickly and efficiently.

Historically, the DWCD has relied on a complicated and inefficient process to develop its seasonal operating plans. This process involves many spreadsheets and requires deep institutional knowledge on the part of staff to execute it properly. The existing process has limited the DWCD's ability to assess multiple operating scenarios and optimize its planned releases. A modernized operations planning tool will directly address these issues.

Measurable Results

0	New Storage Created (acre-feet)
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
381,000	Existing Storage Preserved or Enhanced (acre-feet)
0	New Storage Created (acre-feet)
	Length of Stream Restored or Protected (linear feet)
	Length of Pipe, Canal Built or Improved (linear feet)
	Efficiency Savings (dollars/year)
	Efficiency Savings (acre-feet/year)
	Area of Restored or Preserved Habitat (acres)
	Quantity of Water Shared through Alternative Transfer Mechanisms or water sharing agreement (acre-feet)
	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
100	Number of Coloradans Impacted by Engagement Activity
Other	

This project will optimize the use of McPhee Reservoir water, which has a total storage of 381,000 AF. More efficient operations of McPhee Reservoir will result in improvements to several of McPhee's operating objectives including:

Ensuring irrigation deliveries are fully met
Maximizing carryover storage
Meeting downstream fish health flow targets
Maximizing boatable days

It will also reduce staff time required to develop and share operating plans each year by at least 40 hrs. per year.

Water Project Justification

The Dolores Project is a multi-purpose Bureau of Reclamation initiative located in Montezuma and Dolores Counties in southwest Colorado, managed by the Dolores Water Conservancy District (DWCD). The Project's primary feature, McPhee Reservoir, has a total capacity of 381,000 acre-feet (AF), with 229,000 AF of active storage used to support agricultural, municipal, tribal, recreational, and environmental water needs. Completed in 1986, the reservoir is integral to the region's water supply system. New delivery canals and irrigation laterals associated with the Project were completed in 1999; permitting all current Project waters users to receive their full allocations of water, if available.

McPhee's storage is fully allocated to:
1. Farmers: Irrigating approximately 28,900 acres of agricultural land served by the Dove Creek Canal.
2. Ute Mountain Ute Tribe Farm and Ranch Enterprise: Supporting 7,500 acres of agriculture via the Towaoc-Highline Canal.
3. Montezuma Valley Irrigation Company (MVIC): Receiving supplemental water to augment its Colorado water rights.
4. Municipal & Industrial Users: Supplying water to the City of Cortez, the Town of Dove Creek, and the tribal

community of Towaoc.
5. Environmental Users: Supporting fish and wildlife with releases downstream of McPhee Reservoir.
6. Recreational Users: Coordinating recreational releases for the boating community during favorable hydrological conditions.

The management of McPhee Reservoir requires balancing multiple priorities, including irrigation needs, recreational releases, and environmental health. Collaborative initiatives such as the Dolores River Dialogue, the Dolores Project Drought Contingency Plan, and the Dolores River Native Fish Monitoring & Recommendation Team play a vital role in planning and decision-making. These efforts ensure the region's diverse water users are engaged in the decision-making process, helping DWCD adapt to both routine operations and extreme events like droughts.

However, Southwest Colorado is especially vulnerable to climate change and drought, with the region experiencing some of the most severe impacts in the state. Since 2000, DWCD has faced multiple years of water shortages, including severe droughts in 2002, 2013 where water users received only 25-30% of their allocated supply. Drought contingency plans necessitate active communication, re-operations, and water leasing strategies during shortages—underscoring the need for better forecasting and operational tools.

A modern operations planning tool will support more informed decision-making by enabling scenario analysis, improving water management transparency, and allowing the DWCD to optimize reservoir operations based on the needs of all users.

Current Operations Planning Process and GoldSim Model Improvements
DWCD's current operations planning process relies heavily on manual workflows and institutional knowledge. Developing a seasonal operating plan involves:
1. Contract Allocations: Ensuring water users receive their contracted share based on McPhee's storage.
2. Forecast Assessment: Reviewing available streamflow forecasts to estimate water supply.
3. Scenario Testing: Manually running multiple spreadsheets to predict reservoir operations and determine optimal water releases.
4. Disseminating the Operating Plan: Communicating final plans to users, including farmers, municipalities, and recreational groups.

This process is inefficient and labor-intensive, with limited ability to run multiple operational scenarios quickly. Changes in conditions—such as lower-than-expected runoff—can force DWCD to adjust releases mid-season, resulting in clawbacks from users, as happened in recent years. The reliance on spreadsheets also reduces transparency, making it difficult for external stakeholders to engage effectively in the decision-making process.

The GoldSim-based planning tool will directly address these inefficiencies by integrating advanced forecasting and modeling capabilities. The tool's Monte Carlo framework will allow DWCD to:
Quickly test multiple scenarios under varying water supply conditions.
Optimize releases for different user needs, including agricultural irrigation, municipal supply, environmental flows, and recreational releases.
Integrate real-time streamflow forecasts from the Colorado Basin River Forecast Center (CBRFC).
Improve transparency and communication by generating clear, data-driven plans that stakeholders can easily understand.
With the GoldSim model in place, DWCD will no longer depend on manual spreadsheet calculations, significantly reducing staff time and minimizing the risk of errors. This enhanced planning process will allow for better decision-making and improve the district's ability to manage McPhee's limited resources in both average and dry years.

Relevant Water Plan and Southwest Basin Implementation Plan Goals and Citations:

The proposed operations planning tool aligns directly with the priorities outlined in the 2023 Colorado Water Plan and the 2022 Southwest Basin Implementation Plan (BIP), helping DWCD meet both local and statewide water management goals.
Colorado Water Plan – Chapter 6: Vision and Actions for Addressing Colorado's Risks
1. Robust Agriculture: The planning tool ensures reliable water deliveries to farmers and tribal agriculture, minimizing the impact of dry years.
2. Resilient Planning: By optimizing Thoughtful Storage, DWCD will prevent over-releases and better manage McPhee Reservoir's storage during droughts.
3. Drought Resiliency: With improved forecasting and scenario analysis, DWCD will enhance water security for all users, reducing operational uncertainty.
Southwest Basin Implementation Plan (2022) – Key Goals and Strategies
1. Support agricultural needs: Reliable water supply planning will stabilize agricultural production, even in dry years.
2. Meet municipal and industrial needs: Improved planning will ensure sustainable water delivery to Cortez, Dove Creek, and Towaoc.
3. Meet environmental and recreational needs: Optimized releases will support fish habitat and recreational boating.
4. B4 – Increase carryover storage: Improved forecasting will allow DWCD to manage storage more effectively and buffer against future shortages.
5. B5 – Recognize agriculture's contributions to recreation and the environment: Strategic planning will ensure water allocations support multiple uses.
6. D2 – Prioritize projects to quantify environmental and recreational needs: Scenario-based planning will allow DWCD to better balance the demands of all users.

This project also builds on the Colorado Airborne Snow Measurement (CASM) program, leveraging improved snowpack information and streamflow forecasts to inform DWCD's operational decisions. The GoldSim model developed in this project will provide a modern, transparent framework for planning, ensuring the district can meet the needs of all stakeholders while preparing for increasingly variable hydrological conditions.

Related Studies

The Dolores Water Conservancy District has been involved in the Colorado Airborne Snow Measurement Program (CASM) since 2020. The CASM program has been funded by the Colorado Water Conservation Board through a variety of funding sources, including a Water Plan Grant titled: "Phase I of the Colorado Aerial Snowpack Measurement Study" conducted by Northern Water in 2022. The CASM program delivers high resolution snowpack data and associated streamflow forecasts for dozens of water management entities across Colorado. The forecasts delivered from the various activities under the CASM program will be brought into the forecast model developed during this project.

Management of McPhee reservoir and the Dolores river for fish health, recreation, and water supply has been the subject of several ongoing planning processes including:
• The Dolores River Dialogue
• Dolores Project Drought Contingency Plan
• Ongoing work of Dolores River Native Fish Monitoring & Recommendation Team
• Southwest Roundtable Basin Implementation Plan
• Protect the Dolores by Dolores River Boating Advocates

These planning processes are ongoing and provide regular input on fish health, flow requirements, water development, and recreational uses of Dolores project water. The model and resulting output from this project will allow Dolores Water Conservancy District to conduct more scenario analysis and more carefully balance the needs of all local interests.

Additionally, the DWCD 2014 Drought Contingency Plan emphasizes the importance of proactive communication and flexible management during drought years. Between 2000 and 2013, McPhee water users faced three major shortages: 2002 and 2013, with only 25-30% of allocations, and 2003, with 50% supply. These shortages illustrate the need for dynamic tools to manage both hydrological variability and operational obligations. To address these challenges, the contingency plan outlines non-structural strategies such as:

- Enhanced communication among users to share water availability and timing projections.
- Water leasing between users to address specific shortages.
- Re-operation of reservoirs to adapt to changing conditions.

The proposed GoldSim model will enable DWCD to implement these strategies more effectively by improving scenario analysis and enhancing communication with stakeholders, ensuring resilient operations even under drought conditions.

Taxpayer Bill of Rights

DWCD does not have any TABOR issues