COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Plan

Water Project Summary

Name of Applicant	Corriente
Name of Water Project	Improving Delivery Efficiencies on Ditch and Canal Systems with Low-cost Data and Records Management
Grant Request Amount	**$96,850.00**
Primary Category	$96,850.00
Agricultural Projects	
Total Applicant Match	**$62,300.00**
Applicant Cash Match	$35,000.00
Applicant In-Kind Match	$27,300.00
Total Other Sources of Funding	**$100,200.00**
Office of Economic Development and International Trade	$75,000.00
Colorado Ag Water Alliance	$20,000.00
Partner Ditch Companies	$5,200.00
Total Project Cost	**$259,350.00**

Applicant & Grantee Information

Name of Grantee: Corriente
Mailing Address: 1277 Cooper Trail Canon City CO 81212

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Position/Title:
Email: blake@corrienteco.com
Phone: 719-429-1099

Description of Grantee/Applicant

No description provided

Type of Eligible Entity

- [ ] Public (Government)
- [ ] Public (District)
- [ ] Public (Municipality)
- [ ] Ditch Company
- [ ] Private Incorporated
- [x] Private Individual, Partnership, or Sole Proprietor
- [ ] Non-governmental Organization
- [ ] Covered Entity
- [ ] Other

Category of Water Project

- [x] 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	38.436752
Longitude	-105.254713
Lat Long Flag	Precise coordinates: Project coordinates are readily definable and precisely define the location of the project
Water Source	Colorado River, Arkansas River, Cache La Poudre River
Basins	Arkansas; Colorado; South Platte
Counties	Fremont; Larimer; Weld; Mesa
Districts	12-Arkansas: Salida to Portland; 72-Lower Colorado River; 3-Cache La Poudre River

Water Project Overview

Major Water Use Type	Agricultural
Type of Water Project	Study
Scheduled Start Date - Design	5/1/2025
Scheduled Start Date - Construction	

Description

The Colorado Water Plan recognizes water use efficiency as a method for meeting the water supply/demand gaps. However, an important (but often overlooked) part of efficient water use is the efficient delivery and management of the state’s surface waters to their eventual places of use. Most of the state’s surface waters are taken from decreed points of diversion and flow through ditch or canal systems to their eventual places of use.

Corriente Solutions is partnering with ditch and canal companies across Colorado to help them be more efficient with the delivery and use of their decreed water rights by creating new tools to capture and store data, track water deliveries and maximize the beneficial uses while protecting water rights. We are seeking funding to implement a pilot project with the Hydraulic Ditch Company, the Orchard Mesa Irrigation District, and the Larimer and Weld Canal Companies to test a first-of-its-kind software tool specifically designed for ditch and canal companies and integrated with low-cost sensor technologies. This project will offer immense and immediate process improvements in water resources management as there is a substantial need for water managers to keep good records and data, improve delivery efficiencies and maximize beneficial uses.

Measurable Results

0	New Storage Created (acre-feet)
0	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
0	Existing Storage Preserved or Enhanced (acre-feet)
0	New Storage Created (acre-feet)
0	Length of Stream Restored or Protected (linear feet)
0.00	Length of Pipe, Canal Built or Improved (linear feet)
$1,558,100	Efficiency Savings (dollars/year)
2,912	Efficiency Savings (acre-feet/year)
0	Area of Restored or Preserved Habitat (acres)
0	Quantity of Water Shared through Alternative Transfer Mechanisms or water sharing agreement (acre-feet)
5,000	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
300	Number of Coloradans Impacted by Engagement Activity

Other

No additional measurable results provided

Water Project Justification

Water is the lifeblood that supports western US economies, cultures, and ecosystems. With so much of our western-way-of-life built on the foundation of this unpredictable resource, we try to create a predictable structure for equitably apportioning water in the western US, most notably with our historic (and legally solid) Colorado Doctrine of Prior Appropriation for water rights administration. Within this doctrine, one of the seven critical pieces of information for all surface water rights is the location at which the water is diverted. This point of diversion is most often the headgate of a ditch or canal system, and these complex water transportation systems often do not have enough data or information to ensure the most efficient delivery of water to meet the maximum legal beneficial uses.

Due to Colorado’s water rights doctrine, trillions of gallons of Colorado's surface waters are diverted from rivers or streams through ditches and canals and carried to their eventual places of use. There are thousands of ditches/canals in Colorado and, therefore, many thousands of water managers responsible for stewarding this limited resource. Most of these water managers, however, do not have a good system for keeping information organized and accessible. This leads to inefficiencies in daily operations, water allocation and use, and potentially impacts water rights from less-than-optimal consumptive use (assuming the ditch is “water short”, which many in Colorado are). Due to the unpredictable nature of water administration, water managers often operate in a highly reactive environment with little time to plan, document, or analyze important information. The current tools of documentation and data collection (institutional knowledge - sometimes pen and paper or excel) are inefficient and often lead to inaction because they are not time or resource efficient. Just as FedEX or UPS would not create an inefficient package delivery system, inefficient water deliveries can materially harm water

users and the environment. Data is critical for making informed decisions, but most ditch and canal company water managers are not data scientists.

Corriente Environmental Solutions (Corriente) is developing a novel water management tool called RecordFLOW to give thousands of water managers across Colorado an easy-to-use, affordable, and powerful tool to track water management operations and collect important information to support their water rights. RecordFLOW will be a data collection tool that will offer simple decision-making support tools such as industry specific and simplistic workflows, push-button deployment, common language analytics, and an intuitive and clean user interface.

This project builds on our previous work with ditch and canal companies to develop and test a new tool specifically designed to help them capture data and record important information, analyze and display that information in an organized and meaningful way, and store the data in a secure but accessible manner. This project is the evolution of more than three years of work to help ditch and canal companies capture important data. We recognized early in this work that an easy-to-use software tool was the best way to scale our work and help the most ditch and canal companies operate efficiently. We have spent these past three years refining our approach and streamlining the workflows to fit ditch and canal companies' specific needs. Now, we are ready to refine and validate the software and hardware tools ditch and canal companies are eager for.

For this project, Corriente Solutions is partnering with three ditch and canal companies across Colorado to pilot test our new software and hardware integrations. Our partners for this project include the Hydraulic Ditch Company in Fremont County; the Orchard Mesa Irrigation District in Mesa County; and the Larimer and Weld Irrigation Companies in Larimer and Weld Counties. These three ditch/canal systems share many commonalities, including complex administration needs, changing land/water use patterns, water supply challenges, large infrastructure maintenance, stormwater management concerns, etc. However, they are each different in their water rights portfolios (mix of junior and senior rights), water supply conditions, local land-use codes, among many others. This pilot project will give us a good understanding of the limits and constraints of three complex ditch and canal systems. With any good software tool, you must balance customization with scalability. This pilot project will allow us to develop and test the most useful features of the software while providing the greatest reach to the diversity of ditch and canal companies in Colorado.

Our innovative project supports many goals in the Colorado Water Plan and specifically focuses on three of the main partner action categories: 1) Resiliency Planning, 2) Robust Agriculture, and 3) Vibrant Communities.

Resilient Planning – if there was a Water Plan grant category specifically for resiliency planning, our project would fit like a glove. The entire point for building this new software product has been from our experience, and our ditch and canal partners experiences, of trying to make decisions but not knowing how a change to a complex administrative system could hurt current or future water users. Often, there is simply not enough information about why and how decisions were made over the past several decades (even centuries) to justify current administrative practices or infrastructure development decisions. Additionally, the rapidly changing water landscape of water transfers and land-use changes necessitates better records and more data than ever before to administer increasingly complex ditch and canal systems. There is a simple saying in the water world, "you cannot administer what you do not measure", and in many cases, ditch and canal companies are tasked with complex administration and very little data to support their decisions. They are finding what may have worked for decades is now more challenging. Our data platform, combined with real-time sensor data from low-cost RecordFLOW sensors will give these water managers more information for more informed water deliveries and more efficient uses of the waters.

Robust Agriculture – it is well understood that most of the water use in Colorado is for agriculturally decreed

uses. To our knowledge, all the surface water used in irrigated agriculture is diverted, by decree, and carried to its eventual place of use through a ditch or canal, not to mention on- and off-farm laterals. Improving the transportation and delivery efficiencies of these systems will benefit agriculture with improved delivery schedules, more robust early-season planning, flexible tools to make decisions on water allocation with real-time data, and low-cost sensors to help understand real-time conditions at points on the ditch. When water is not managed or delivered to maximum efficiency it can end up being wasted through overirrigation of certain lands or non-beneficial evapotranspiration. Of course, ditches and canals are usually required to maintain a certain portion of the diversion for historical return flows. If enough data is collected, the RecordFLOW software will help ditch and canal companies be as efficient as possible with the allocated historical consumptive use while also having the ability to monitor and calculate historic return flows. Simply put, RecordFLOW will help agricultural users better understand and manage their most vital input, water. When an acre-foot of water is the difference between a profitable yield or not, improving the efficiency and accuracy of water management will lead to more prosperous and robust agriculture in Colorado.

Vibrant Communities – The Colorado Water Plan explicitly mentions the need for cities to invest in infrastructure and increase efficiency and conservation. This applies to raw water delivery as well as treated. This is particularly important where cities have water shares in a ditch that is also managed for other uses, like agriculture. This is particularly relevant in rural municipalities where cities are shareholders and depend on the efficient transport and use of water to meet their municipal needs. The Water Plan also mentions the need for cities to accurately monitor water use and reduce loss while also investing in innovative technologies. RecordFLOW will help by more accurately tracking and recording raw water deliveries. The data can be used to make real-time adjustments and analyzed for long-term trends.

Finally, Corriente is ideally positioned to work with the water community to deliver this new tool. First, through our experience and market research, this type of water management software will only be trusted by the water community if a for-profit company can provide data security and affordability. We have found that the majority of ditch and canal companies are hesitant to give more data to any government entity, and they often view non-profits with similar skepticism. Our company considered transitioning to a non-profit because this project would offer immeasurable benefits to the State of Colorado and its citizens, but there are several reasons that will not work, including continual costs for the software infrastructure, software delivery model, trust among the water community, etc. Second, we are a mission-driven company that is focused on helping water users realize the maximum benefit from their water rights while being mindful of our environment. We believe this is a win-win for the entire state of Colorado. Finally, we have been working on this project for more than 3 years and have refined our tools to meet the needs of water managers. We have developed prototypes and worked with ditches around the state to refine the software. We are eager to put all we have learned into a final product that will offer ditch and canal companies an affordable, easy-to-use software and hardware solution to help manage water more efficiently now and in the future. This Colorado Water Plan grant will not provide any money for Corriente's operating budget, there will be no salaries or other compensation from this grant, nor any overhead expenses.

Related Studies

Corriente has already built two prototype RecordFLOW software platforms, worked with water managers to test the functionality of the prototypes, performed research and outreach, and secured grants to support our early-stage work as well as funding to support our current work. We have also built a prototype low-cost water level sensor that will be deployed in 2025.

Taxpayer Bill of Rights

We have no TABOR restrictions.