Last Updated: November 2018

Colorado Water Conservation Board

Water Plan Grant Application

Instructions

To receive funding for a Water Plan Grant, applicant must demonstrate how the project, activity, or process (collectively referred to as "project") funded by the CWCB will help meet the measurable objectives and critical actions in the Water Plan. Grant guidelines are available on the CWCB website.

If you have questions, please contact CWCB at (303) 866-3441 or email the following staff to assist you with applications in the following areas:

Water Storage Projects	Anna.Mauss@state.co.us
Conservation, Land Use Planning	Kevin.Reidy@state.co.us
Engagement & Innovation Activities	Ben.Wade@state.co.us
Agricultural Projects	Alexander.Funk@state.co.us
Environmental & Recreation Projects	Chris.Sturm@state.co.us

FINAL SUBMISSION: Submit all application materials in one email to *waterplan.grants@state.co.us* in the original file formats [Application (word); Statement of Work (word); Budget/Schedule (excel)]. Please do not combine documents. In the subject line, please include the funding category and name of the project.

Water Project Summary

Name of Applicant	Trout Unlimited
Name of Water Project	Innovative Irrigation Efficiency for Mountain Meadows

CWP Grant Request Amount	$54,048
Other Funding Sources UGRWCD will Request	$20,860
Other Funding Sources Ranch Partners/ NCB	$11,000
Other Funding Sources Wet Meadows Restoration	$4,000
Other Funding Sources UGWMP	$15,000
Applicant Funding Contribution	$8000
Total Project Cost	$112,908

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Applicant & Grantee Information
Name of Grantee(s): Trout Unlimited
Mailing Address: 1777 N. Kent Street, Suite 100 Arlington, VA 22209
FEIN: 38-1612715
Organization Contact: Danielle Typinski
Position/Title: Grant Compliance Coordinator
Email: dtypinske@tu.org
Phone: (703)284-9429
Grant Management Contact Jesse Kruthaupt
Position/Title: Upper Gunnison Project Specialist, Ohio Creek Watershed Management Coordinator
Email: jkruthaupt@tu.org
Phone: 970-209-0976
Name of Applicant (if different than grantee)
Mailing Address
Position/Title
Email
Phone

Description of Grantee/Applicant
Provide a brief description of the grantee's organization (100 words or less).
Trout Unlimited (TU), the nation's largest coldwater conservation organization, representing more than 150,000 members and volunteers nationwide, including 10,000 in Colorado, has a program in the Upper Gunnison Basin focused on water use solutions that will benefit agricultural operations as well as protect and improve cold water trout habitat. Jesse Kruthaupt works for Trout Unlimited as the upper Gunnison project coordinator

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Type of Eligible Entity (check one)	
	Public (Government): Municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
	Public (Districts): Authorities, Title 32/special districts (conservancy, conservation, and irrigation districts), and water activity enterprises.
	Private Incorporated: Mutual ditch companies, homeowners associations, corporations.
	Private Individuals, Partnerships, and Sole Proprietors: Private parties may be eligible for funding.
x	**Non-governmental organizations (NGO):** Organization that is not part of the government and is non-profit in nature.
	Covered Entity: As defined in Section 37-60-126 Colorado Revised Statutes.

Type of Water Project (check all that apply)	
x	Study
x	Construction
	Identified Projects and Processes (IPP)
x	Other: Demonstration

Category of Water Project (check the primary category that applies and include relevant tasks)	
	Water Storage - 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. *Applicable Exhibit A Task(s):*
	Conservation and Land Use Planning - Activities and projects that implement long-term strategies for conservation, land use, and drought planning. *Applicable Exhibit A Task(s):*
	Engagement & Innovation - Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website. *Applicable Exhibit A Task(s):*
x	Agricultural - Projects that provide technical assistance and improve agricultural efficiency. *Applicable Exhibit A Task(s):*
	Environmental & Recreation - Projects that promote watershed health, environmental health, and recreation. *Applicable Exhibit A Task(s):*

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	Other	Explain:

Location of Water Project	
Please provide the general county and coordinates of the proposed project below in **decimal degrees**. The Applicant shall also provide, in Exhibit C, a site map if applicable.	
County/Counties	Gunnison, CO
Latitude	38.622638°
Longitude	-106.895812°

Water Project Overview
Please provide a summary of the proposed water project (200 words or less). Include a description of the project and what the CWP Grant funding will be used for specifically (e.g., studies, permitting process, construction). Provide a description of the water supply source to be utilized or the water body affected by the project, where applicable. Include details such as acres under irrigation, types of crops irrigated, number of residential and commercial taps, length of ditch improvements, length of pipe installed, and area of habitat improvements, where applicable. If this project addresses multiple purposes or spans multiple basins, please explain. The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, Other Funding Sources/Amounts and Schedule.

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This project is a cooperative effort coordinated by Trout Unlimited (TU) to improve flood irrigation efficiency by using technology and innovation. This project will be carried out with assistance from the Upper Gunnison Watershed Management Planning Effort, five agricultural producers in the Gunnison basin, the Upper Gunnison River Water Conservancy District (UGRWCD), and the Gunnison Soil Conservation District.

This project will demonstrate and test three water management alternatives to improve irrigation efficiency on mountain meadows in the Upper Gunnison basin. The goal of this project is to improve irrigation practices by automating irrigation sets, reducing conveyance losses, monitoring soil moisture, ground water, and ditch conditions with remote sensing.

In the Upper Gunnison Basin, efficiency projects will take place on ditches diverting from Ohio Creek, East River, and the mainstem of the Gunnison. Approximately 600 acres of grass hay will be directly impacted by the efficiency improvements. These projects will provide labor and water savings and enhance irrigation management and agricultural productions.

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Measurable Results	
To catalog measurable results achieved with the CWP Grant funds, please provide any of the following values as applicable:	
	New Storage Created (acre-feet)
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
	Existing Storage Preserved or Enhanced (acre-feet)
	Length of Stream Restored or Protected (linear feet)
$1,600/year labor savings 800 AF/year water savings	Efficiency Savings (indicate acre-feet/year OR dollars/year)
	Area of Restored or Preserved Habitat (acres)
	Quantity of Water Shared through Alternative Transfer Mechanisms
	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
	Number of Coloradans Impacted by Engagement Activity

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x	Other	Explain: Addressing Watershed Assessment identified needs.

Water Project Justification

Provide a description of how this water project supports the goals of Colorado's Water Plan, the most recent Statewide Water Supply Initiative, and the applicable Roundtable Basin Implementation Plan and Education Action Plan. The Applicant is required to reference specific needs, goals, themes, or Identified Projects and Processes (IPPs), including citations (e.g. document, chapters, sections, or page numbers).

The proposed water project shall be evaluated based upon how well the proposal conforms to Colorado's Water Plan Framework for State of Colorado Support for a Water Project (CWP, Section 9.4, pp. 9-43 to 9-44;)

This project will support Gunnison BIP Goal 1: Protect Existing Uses; Goal 2: Discourage the conversion of productive agricultural land to other uses within the context of private property rights; and Goal 8: Restore, maintain, and modernize critical water infrastructure, including hydropower (Gunnison BIP, pp 30-31). Investing in irrigation infrastructure and using technology to modernize management and improve production will allow ranchers the opportunity to continue profitable enterprises and decrease the likelihood water rights and productive land will be converted to other uses.

The Gunnison BIP on page 50, Table 13, shows shortages totaling 16,700-acre feet annually for the East River water district. This project will have the potential to reduce that shortage by saving 800 acre feet annually through upgraded infrastructure and increased irrigation efficiency.

The Colorado Water Plan Water Plan frequently references collaboration and multiple use projects. In section 6.6, page 6-157, the third goal listed is "Support the development of multipurpose projects and methods that benefit environmental and recreational water needs as well as water needs for communities or agriculture". This project will involve coordination between NGO's, private land owners, and governmental agencies. This project will improve agricultural production and late season stream flows by improving management of flood irrigation that recharges the alluvial aquifer. Improved irrigation efficiency can also offer water users the flexibility to effectively irrigate with less water diverted from the stream.

As mentioned on page 15 of Chapter 5, Water Demands of the Water Plan, scientists predict that increasing temperatures, as a result of climate change, will reduce cold-water habitat for trout. Modifying the diversions through efficiency improvements provides an opportunity to maintain flows and temperatures suitable for a healthy fishery

On page 1-6 of the Colorado Water plan cites three core water values. The second value is "Efficient and effective water infrastructure promoting smart land use." This project will use technology and innovation to allow efficient water management.

Related Studies

Please provide a list of any related studies, including if the water project is complementary to or assists in the implementation of other CWCB programs.

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The Upper Gunnison River Water Conservancy District began the Upper Gunnison Watershed Assessment in 2017. This assessment is funded through the CWCB's Watershed Restoration Grant Program. The identification of recreational and agricultural water use needs and locations of water shortages for the East River, Ohio Creek and the Lake fork of the Gunnison has been completed and has informed the tasks selected for this project.
This project will address three needs identified in the Upper Gunnison assessment.

1. Conveyance improvement Teachout Mesa Ditch, Ohio Creek.
2. Improve irrigation practices that maintain groundwater recharge for wells and springs, Ohio Creek.
3. Reduce diversion dry up below Kubiack Ditch, East River.

Irrigation shortages and instream shortages have also been identified at multiple sites on Ohio Creek and the East River Watersheds. Demonstrating increased efficiency through scheduled irrigation management, and improved monitoring will allow less water to produce equal or greater yields. This could have implications for all uses in the watershed.

Previous CWCB Grants, Loans or Other Funding

List all previous or current CWCB grants (including WSRF) awarded to both the Applicant and Grantee. Include: 1) Applicant name; 2) Water activity name; 3) Approving RT(s); 4) CWCB board meeting date; 5) Contract number or purchase order; 6) Percentage of other CWCB funding for your overall project.

Grant Name	Agreement Number	Amount	Start Date	End Date
Irrigators in Kremmling	CTGG1 2017-0667	$465,400	11/29/2016	9/30/2018
Redburn Ranch Diversion Dam	CTGG1 2015-2791	$148,500	1/27/2015	6/1/2018
San Miguel River Stream Management Plan Pilot	POGG1 2016-0800	$96,413	3/22/2016	6/1/2018
Ware Hinds Fish Bypass	POGG1 2017-0749	$63,500	2/14/2017	12/31/2018
Windy Gap Reservoir Bypass	POGG1 2016-0900	$30,000	5/18/2016	1/31/2017
W-Mountain Ranch Restoration	POGG1 2016-0610	$15,000	1/8/2015	5/31/2017
Kerber Creek Restoration	POGG1 2015-0286	$30,000	6/10/2015	10/31/2016
River Ranch Irrigation Diversion	CTGG1 2015-3313	$113,000	6/9/2015	5/31/2016
South Arkansas River Restoration	POGG1 2015-0175	$10,000	11/14/2014	10/31/2016
Upper Ohio Creek Flow Restoration	POGG1 2015-0161	$6,000	10/10/2014	12/31/2014
Tomichi Water Conservation Program	POGG1 2018-901 &902	$109,500 (50%)	5/4/2018	5/4/2018

Taxpayer Bill of Rights

The Taxpayer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect your application.

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NONE

Submittal Checklist	
x	I acknowledge the Grantee will be able to contract with CWCB using the Standard Contract.
Exhibit A	
x	Statement of Work(1)
x	Budget & Schedule(1)
	Engineer's statement of probable cost (projects over $100,000)
x	Letters of Matching and/or Pending 3rd Party Commitments(1)
Exhibit C	
x	Map (if applicable)(1)
x	Photos/Drawings/Reports
x	Letters of Support (Optional)
	Certificate of Insurance (General, Auto, & Workers' Comp.) (2)
	Certificate of Good Standing with Colorado Secretary of State(2)
	W-9(2)
	Independent Contractor Form(2) (If applicant is individual, not company/organization)
Engagement & Innovation Grant Applicants ONLY	
	Engagement & Innovation Supplemental Application(1)

(1) Required with application.
(2) Required for contracting. While optional at the time of this application, submission can expedite contracting upon CWCB Board approval.

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Colorado Water Conservation Board
Water Plan Grant - Exhibit A

Statement Of Work	
Date:	**1/22/2018**
Name of Grantee:	**Trout Unlimited**
Name of Water Project:	**Innovative irrigation Efficiency for Mountain Meadows**
Funding Source:	**CWP Grant – Agricultural Category**
Water Project Overview:	
This project is a cooperative effort coordinated by Trout Unlimited (TU) to improve flood irrigation efficiency by using technology and innovation and will be carried out with assistance from the Upper Gunnison Watershed Management Planning Effort, five agricultural producers in the Gunnison basin, the Upper Gunnison River Water Conservancy District (UGRWCD), and the Gunnison Soil Conservation District. Project partners will demonstrate and test three water management alternatives to improve irrigation efficiency on mountain meadows in the Upper Gunnison valley. The goal of this project is to improve irrigation practices by automating irrigation sets, reducing conveyance losses, monitoring soil moisture, ground water, and ditch conditions with remote sensing. In the Upper Gunnison Basin, efficiency projects will take place on ditches diverting from Ohio Creek, East River, and the mainstem of the Gunnison. Approximately 600 acres of grass hay will be directly impacted by the efficiency improvements. These projects will provide labor and water savings and promote irrigation management and agricultural production. Successful implementation of these strategies will encourage producers in other Upper Gunnison sub-basins to become engaged in the Watershed Management Planning effort and evaluate similar efficiency improvements for their watershed.	
Project Objectives:	

The goal of this project is to demonstrate strategies that will help irrigators improve efficiency while maximizing cost benefit, labor savings, water savings, while maintaining historic flow patterns. This will be accomplished by.

- Installing automatic irrigation control structures
- Reducing transit loss in the Teachout Mesa Ditch
- Setting up a remote sensing network for monitoring stream, ditch and field conditions.
- Sharing these innovative tools with agricultural producers in the Gunnison basin.

This project will also provide a tangible product resulting from the UG Watershed Assessment and will be leveraged to engage producers in the process.

Tasks

Task 1 – Automated Irrigation Scheduling

Description of Task:

In 2018, TU worked with the Trampe Ranch to develop a prototype irrigation check structure that can be set to automatically open at a specified time. Five of these structures were placed in a ditch then programed to open in consecutive order thereby preforming an irrigation "set" automatically over a three-day period. This task will expand the use of the Trampe prototype and retrofit 6 NRCS check structures on the Anders ranch in the East River watershed with equipment allowing the water user to run an irrigation set automatically. The Anders field is long and narrow and if water is not changed on schedule production suffers. The water user currently manually stacks and removes boards at these structures twice a day to effectively irrigate the field. Automated scheduling will allow the water user to irrigate the meadow with estimated 10-15% less water and will save and estimated 20 hrs a week in labor.

This task will also include the design and installation of 6 auto-close gate inserts that will fit into new concrete structures on the Trampe Ranch. The concrete structures will be built using a standard form and will be easily replicated. The design will allow the irrigator to remove and place the gate inserts with ease and interchange the insert between structures on the ranch. For example, six of the inserts can be placed in a ditch segment, operated, then moved to the next segment when that set is complete. Using the same inserts at multiple locations will allow a water user to upgrade to automation without a large investment to outfit every control structure on the property.

Method/Procedure:

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Tasks
Trout Unlimited will hire a contractor to construct a frame-and-plate insert with the latch, shocks and timer similar to what was used with the 2018 Trampe prototype. In May of 2019, TU will assist the water users to install the auto-gate insert on 6 NRCS irrigation check structures on the Anders Ranch. The contractor hired to construct the auto-open gate will also construct the auto-close gate insert for the Trampe Ranch. This frame and plate structures will be like the auto-open but will eliminate the need for the gas shock, thereby further reducing the overall cost. Trout Unlimited will coordinate the design and installation of the concrete structures and plate inserts. Some funding was budgeted to upgrade the existing structures as needed to ensure proper operation. Once installed and operated, TU will present to the Gunnison Stockgrowers, Gunnison Soil Conservation District, and the Upper Gunnison River Water Conservancy District. Two site tours will be scheduled for water users in the area.
Deliverable:
• Photos of 6 completed auto-open and 5 completed auto-close structures prior to and post install. • Participant list and report from 2 Site visits. • Video of auto-gates installation and operation. • Two presentations to agricultural user associations like CAWA, UVWUA, Gunnison County Stockgrowers. • One article in local and state media outlets highlighting the agricultural water use innovation and value of irrigation scheduling.

Tasks
Task 2 – Ditch Sealant Trial
Description of Task:

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Tasks
In the Upper Gunnison, efficiency improvements like piping ditches and converting to sprinkler are often cost prohibitive for grass hay producers due to the short growing season and large volume of water decreed to irrigate the cobble substrate present throughout the valley. However, such improvements in conveyance can increase irrigation efficiency by 15-20%. This task will test the effectiveness and longevity of a soil amendment product named Soilfloc This task will also involve the purchase and installation of geomembrane liner on the most troublesome section of the Teachout Ditch. In 2018, as part of the watershed management planning effort, TU and Alpine Environmental consultants measured losses on this segment of the Teachout Mesa Ditch to be 20% of the ditch flow. Seepage from the Teachout Mesa Ditch collects in a barrow ditch along County Rd 730 then percolates under the road to an adjacent field. In fact, drain ditches have been dug on that field because it is difficult to dry out when necessary. The owner of this field and the owners of the Teachout/Mesa ditch are interested in reducing conveyance losses on a 2-mile segment of ditch that is most problematic.
Method/Procedure:
TU will purchase and coordinate the application of Soilfloc and the geomembrane liner. Soilfloc test will take place on a 3,000ft segment of ditch. The geomembrane will be installed on 8,000 feet of ditch. Total treatment will exceed 2-miles. Trout unlimited will coordinate with ditch owners and a contractor to install the sealant and the liner as specified by the manufacture. Ditch owners will provide labor and equipment necessary for installation. To perform the test of the Soilfloc, flow measurements will be taken on a weekly basis above and below the segment treated. Level loggers will be installed at each monitoring site to record stage every hour. These sites will be monitored for 3 years to evaluate the effectiveness and duration that the Soilfloc product reduces ditch loss. A similar sized segment of ditch on will be monitored as the control during the three-year test period. Trout Unlimited will manage one intern from WSCU during each of the three years. The interns will assist with installation of the gages, flow measurements, data collection, and data computation. At the end of each irrigation season results of the test will be shared with project funding partners and water users in the Upper Gunnison basin.
Deliverable:
• 8,000 ft of lined ditch • Annual report on ditch flow measurements and changes in conveyance losses • Report on total cost and resulting conveyance benefits • Photos of flow monitoring sites • Summary of agricultural or water use associations meetings where test results are presented.

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Tasks
Task 3 – Remote sensing for monitoring field and ditch conditions
Description of Task:
In 2018, Automated Farming Solutions helped TU develop a low-cost solution to monitor and log ground water levels on the Trampe Ranch with existing ranch WiFi and AWS web services. We found that Wifi has limitations communicating across distances on large ranches and remote fields. Similarly, remote monitoring using cell or satellite communication evaluated in 2018 were not cost effective for hay growers in mountain valleys. A technology called LoRaWAN is a low power wide area (LPWA) networking protocol designed to wirelessly connect battery operated sensors to the internet in regional, national or global networks. This technology can provide wireless communication to hundreds of remote sensors for multiple users through one gateway, or base station. The base station must be connected to the internet. Tests have shown the range between the base station and sensors can exceed 10-miles line-of-site. This task will involve the purchase and installation of a LoraWAN gateway near the Trampe Ranch and the installation of 12 sensors to monitor soil moisture, ditch levels, well levels, or stream levels on the ranch and the surrounding area. This task will demonstrate LoraWAN as a cost effective remote monitoring tool that can be used by irrigation districts, ditch associations, or individual ranches to monitor and improve water management. This LoraWAN network could be used to improve both ranch operations and DWR record keeping. Through the UGRWCD watershed assessment process, we have identified reliable diversion records as a priority data gap.
Method/Procedure:
Trout Unlimited will contract with Automated Framing Solutions to set up the LoraWAN base station, program sensors, and develop the web interface for the service. Once the base station is installed and on-line, the service will be available to other water users within range. The base station will be placed at a location elevated from the valley floor with clear view of the Gunnison valley near Gunnison, including lower Tomichi Creek and Ohio Creek. A total of 12 sensors and will be purchased and installed for the Upper Gunnison Basin site. Four sensors will be installed on Trampe Ranch, 4 sensors will be installed to monitor recent wet-meadow restoration on upland range and 4 sensors will be available to neighboring ranches who are interested in experimenting with the technology. Cost of these 12 sensors and 3-years of internet service and technical assistance are included in the budget of this grant. After the three-year period water users will choose if they would like to continue paying for the service. Trout Unlimited will share this automation trial with other agricultural producers in the Gunnison Valley by offering site visits and presentations to ditch associations and organizations like Gunnison Stockgrowers, CAWA, and UGRWCD.
Deliverable:

Tasks
• Installation of LoraWAN Gateway and 12 monitoring sensors in the Gunnison Valley near Gunnison. • Summary of sites selected for sensors including, photos and data collected during the demonstration period. • Two presentations to agricultural user associations like Gunnison County Stockgrowers, CAWA. • One article in local or state media outlets highlighting the use of remote sensing to aid in irrigation water management and irrigation efficiency.

Tasks
Task 4– LoRaWAN Automation Trial
Description of Task:
This task will demonstrate the use of LoRaWAN network installed in Task 3 to remotely control at least one irrigation structure on Trampe Ranch.
Method/Procedure:
Trout Unlimited will contract with Automated Farming Technologies will to purchase a LoRaWAN node to install on one irrigation control structure in the Gunnison Valley. This node will be programed to control a circuit much like the timer does on the prototype automated control structures described in Task 1. The node will be accessible on the dashboard and the water user will be able to trigger a circuit thereby opening or closing the control structure based on field, ditch, or climate conditions. Trout Unlimited will share this automation trial with other agricultural producers in the Gunnison Valley by offering site visits and presentations to ditch associations and organizations like Gunnison Stockgrowers, CAWA, and UGRWCD.

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Tasks
Deliverable:
• Installation of one LoRaWAN node on irrigation control structure • Summary of suitability of LoRaWAN for automation purposes. • One article in local or state media outlets highlighting the use of remote sensing to aid in irrigation water management and irrigation efficiency. • Summary of presentations including organization and date taken place.

Repeat for Task 3, Task 4, Task 5, etc.

Budget and Schedule
This Statement of Work shall be accompanied by a combined Budget and Schedule that reflects the Tasks identified in the Statement of Work and shall be submitted to CWCB in excel format.

Reporting Requirements
Progress Reports: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of issuance of a purchase order, or the execution of a contract. The progress report shall describe the status of the tasks identified in the statement of work, including a description of any major issues that have occurred and any corrective action taken to address these issues.
Final Report: At completion of the project, the applicant shall provide the CWCB a Final Report on the applicant's letterhead that: • Summarizes the project and how the project was completed. • Describes any obstacles encountered, and how these obstacles were overcome. • Confirms that all matching commitments have been fulfilled. • Includes photographs, summaries of meetings and engineering reports/designs. The CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.

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Payment

Payment will be made based on actual expenditures and must include invoices for all work completed. The request for payment must include a description of the work accomplished by task, an estimate of the percent completion for individual tasks and the entire Project in relation to the percentage of budget spent, identification of any major issues, and proposed or implemented corrective actions.

Costs incurred prior to the effective date of this contract are not reimbursable. The last 10% of the entire grant will be paid out when the final deliverable has been received. All products, data and information developed as a result of this contract must be provided to CWCB in hard copy and electronic format as part of the project documentation.

Performance Measures

Performance measures for this contract shall include the following:
(a) Performance standards and evaluation: Grantee will produce detailed deliverables for each task as specified. Grantee shall maintain receipts for all project expenses and documentation of the minimum in-kind contributions (if applicable) per the budget in Exhibit B. Per Water Plan Grant Guidelines, the CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.
(b) Accountability: Per Water Plan Grant Guidelines full documentation of project progress must be submitted with each invoice for reimbursement. Grantee must confirm that all grant conditions have been complied with on each invoice. In addition, per Water Plan Grant Guidelines, Progress Reports must be submitted at least once every 6 months. A Final Report must be submitted and approved before final project payment.
(c) Monitoring Requirements: Grantee is responsible for ongoing monitoring of project progress per Exhibit A. Progress shall be detailed in each invoice and in each Progress Report, as detailed above. Additional inspections or field consultations will be arranged as may be necessary.
(d) Noncompliance Resolution: Payment will be withheld if grantee is not current on all grant conditions. Flagrant disregard for grant conditions will result in a stop work order and cancellation of the Grant Agreement.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Exhibit B
Budget and Schedule

Prepared Date: 1/22/2019
Name of Applicant: Trout Unlimited
Name of Water Project: Innovative Irrigation Efficiency for Mountain Meadows - Agricultural Category
Project Start date:6/1/2019
Project End Date: 6/1/2022

Task No.	Task Description	Start Date	End Date	Unit	Water Plan Grant Funding Request	Cash Match UGRWCD WMP	Cash Match Wet Meadows Restoration	Cash Match UGRWCD (will request)	Participating Ranches (in-kind)	Cash Match No Chico Brush	Inkind Match TU	Total
1	Automated Irrigation Scheduling	5/1/2019	6/1/2022		$9,500.00	$0.00	$0.00	$2,000.00	$2,000.00	$1,000.00	$1,500.00	$16,000
1.1	Materials gate inserts and structure upgrades			1041 each	$9,500.00	$0.00	$0.00	$2,000.00	$0.00	$1,000.00	$0.00	$12,500.00
1.2	Installation Labor			50 hrs	$0.00	$0.00	$0.00	$0.00	$2,000.00	$0.00	$0.00	$2,000.00
1.3	Monitoring and Maintenance			40 hrs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,000.00	$1,000.00
1.4	Outreach			20 hrs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$500.00	$500.00
2	Ditch Conveyance Improvement	6/1/2019	6/1/2022		$37,000	$11,000	$0	$13,000	$8,000	$0	$2,700	$71,700
2.1	Materials Liner			.40 sq ft	$33,000.00	$8,000.00	$0.00	$9,000.00	$0.00	$0.00	$0.00	$50,000.00
2.2	Installation Labor			175 hrs	$2,000.00	$0.00	$0.00	$2,000.00	$8,000.00	$0.00	$2,000.00	$14,000.00
2.3	Soil Amendment sealant			$6 sq ft	$2,000.00	$3,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,000.00
2.4	Monitoring Labor			100 hrs	$0.00	$0.00	$0.00	$2,000.00	$0.00	$0.00	$200.00	$2,200.00
2.4	Outreach			20 hrs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	500	$500.00
3	LoRaWan Remote sensing	6/1/2019	6/1/2022		$0	$3,000	$4,000	$3,000	$0	$0	$3,000	$13,000
	Equipment			750/sensor	$0.00	$0.00	$4,000.00	$2,000.00	$0.00	$0.00	$0.00	$6,000.00
	Installation Labor			62.5hrs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,500.00	$2,500.00
	AFS Programing Labor			30hrs	$0.00	$3,000.00	$0.00	1000	$0.00	$0.00	$0.00	$4,000.00
	Outreach			12.5hrs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	500	$500.00
4	LoraWan Remote Irrigation Control Trial	6/1/2019	6/1/2022	HRs	$1,000	$1,000	$0	$0	$0	$0	$800	$1,800
	Equipment				$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	AFS Programing Labor			10 hrs	$0.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	Labor Installation			20 hrs	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$800.00	$0.00
5	Grant Administration				$7,548	$0	$0	$2,860	$0	$0	$0	$10,408
			Total		$54,048	$15,000	$4,000	$20,860	$10,000	$1,000	$8,000	$112,908

$71,700.00

Exhibit C. Map and photos

Photos: Trampe auto-check Prototype

Example of Replaced structures Kubiack

NRCS Structures to retrofit, Kubiack

Teachout/Mesa Ditch

Upper Gunnison River Water Conservancy District

210 West Spencer Avenue, Suite B • Gunnison, Colorado 81230
(970) 641-6065 • www.ugrwcd.org

January 31, 2019

Re: Trout Unlimited's proposal for irrigation automation, monitoring, and ditch improvements

Dear CWCB,
I am writing to support Trout Unlimited's proposal to the Colorado Water Plan Grant Fund. Jesse Kruthaupt with Trout Unlimited has developed strong partnerships with local ranchers in the Gunnison Basin to implement high tech solutions for improving the efficiency of irrigation and water conveyance. Jesse has worked with the Trampe Ranch, one of the larger landowners in the area, to setup irrigation automation systems. The Colorado Water Plan grant would increase the scope of the automation on the Trampe Ranch, while also adding water level and soil moisture sensors and a large scale remote sensing data collection system. This innovative system would facilitate water related monitoring in many drainages surrounding the town of Gunnison, provide the infrastructure to expand monitoring across the lower Gunnison Basin, and support decision making through the Watershed Management Planning process.

As the Wet Meadow Restoration Coordinator for the Gunnison Basin, I am very interested in setting up soil moisture sensors to determine the effects of our large-scale restoration work. The Wet Meadow Restoration program currently has funding from a CWCB grant (2018-2019) to install sensors in alluvial fans prior to restoration work. We currently monitor vegetation, analyze 'greenness' using satellite based NDVI data, and have a few piezometers installed. Partnering with Trout Unlimited and the LoRaWAN Remote Sensing system funded by the Colorado Water Plan Grant Fund will facilitate the collection of data throughout the lower Gunnison Basin. This data collection infrastructure will assist public land managers (BLM, USFS, NPS, and CPW) and private ranches in managing our resources wisely.

I strongly support Trout Unlimited's proposal to CWCB. It uses innovative technology and builds upon existing partnerships in the agricultural community. Jesse Kruthaupt has developed the partnerships and technological infrastructure to facilitate long-term monitoring and improved water efficiency in the lower Gunnison Basin. These are critical elements to sustainable use of our water resources and will support the Gunnison Basin's Watershed Management Planning.

Please contact me with any questions,

Thomas A. Grant III PhD
Wet Meadow Restoration Coordinator - Gunnison Basin
Contractor to the Upper Gunnison River Water Conservancy District

Gunnison Conservation District
216 North Colorado St, Gunnison CO 81230
(970) 707-3047

January 30, 2019

Colorado Water Conservation Board
Colorado Water Plan Grants
Agricultural Category

RE: Innovative Irrigation Efficiency for Mountain Meadows

Dear Mr. Funk,

The Gunnison Conservation District (GCD) would like to offer our support for the for the Innovative Irrigation Efficiency for Mountain Meadows grant application. The GCD helps ranchers in the Gunnison valley to improve agriculture management and sustain productive range land and irrigated meadows in the Upper Gunnison Valley.

Agriculture provides an important economic and ecological service for the Gunnison and surrounding communities. Like other areas in Colorado, agricultural producers in the Upper Gunnison face challenges from water shortages and continual pressure from other water uses. This project will demonstrate water management alternatives that will maintain critical historic irrigation patterns and provide for improved labor and water use efficiency.

Facilitating water management with the innovative solutions proposed with this project will help ranchers improve their irrigation systems and keep agricultural lands in production. For that reason, GCD encourages the CWCB to award the funding request for this project. Thank you for your consideration.

Sincerely,
William Ketterhagen
Vice President
1/30/19
On Behalf of the
Gunnison Conservation District

January 22, 2018

Colorado Water Conservation Board
Colorado Water Plan Grants
Agricultural Category

RE: Innovative Irrigation Efficiency for Mountain Meadows CWP application

Dear Mr. Funk,

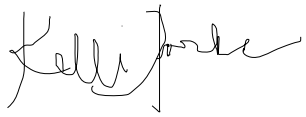
Parker Pastures would like to offer our support for the Innovative Irrigation Efficiency for Mountain Meadows grant application. Parker Pastures HQ is located near the town of Gunnison and we utilize water rights to irrigate hay meadow and pasture for livestock forage throughout the valley.

Agriculture provides an important economic and ecological service for the Upper Gunnison community. Like other areas in Colorado, agricultural producers in the Upper Gunnison face challenges from water shortages and continual pressure from other water uses. This project will demonstrate water management alternatives that will maintain historic irrigation patterns and provide for improved labor and water use efficiency.

Facilitating water management with the innovative solutions proposed in this grant application will help agricultural lands stay in production and support high quality watersheds. For that reason, Parker Pastures encourages the CWCB to award the funding request for this project.

Thank you for your consideration.

Sincerely,



Kelli Parker

Parker Pastures

Colorado State University
Western Colorado Research Center
1910 L Road
Fruita, CO 81521
(970) 434-3264

Alexander Funk
1313 Sherman St., Room 718
Colorado Water Conservation Board
Colorado's Water Plan Grant Fund
Denver, CO 80203

RE: Letter of Recommendation for Funding

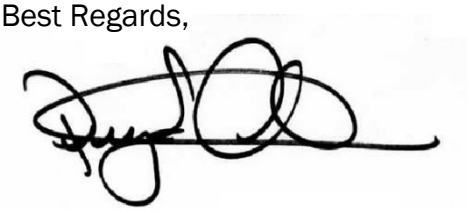
February 1, 2019

Dear Alex:

I am writing to offer my enthusiastic support for the project being submitted by Trout Unlimited and Jesse Kruthaupt entitled "Innovative Irrigation Efficiency for Mountain Meadows Application." The project being proposed by Mr. Kruthaupt identifies several key areas that are critical to supporting optimal water application and delivery in an agricultural area that is highly representative of much of the Western Slope. Based on my conversations over the years with producers in the Upper Gunnison River area, there is an expressed interest in developing a simple and low-cost system for opening up irrigation zones based on simple environmental triggers (e.g., soil moisture sensing, etc.). I have worked with Mr. Kruthaupt over the years and seen the work he is doing as a quiet progression towards a highly desirable endpoint.

I am excited to see that the project he is proposing will include a multi-stage approach to irrigation water management in the challenging conditions of irrigated pastures. In particular, by merging automated structures, ditch sealants, telemetric monitoring and low-cost technology, I believe that the project will be impactful in an environment that is similar to many thousands of acres across Western Colorado, where there is a desire among many groups to more efficiently use water for both consumptive and non-consumptive uses. This is an exciting project with a core idea that has deep support from many with whom I have spoken.

Best Regards,



Dr. Perry Cabot
Research and Extension Leader, Western Colorado Research Center