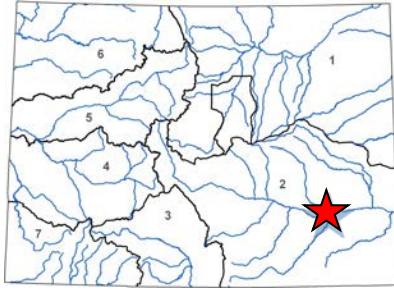




**Soil Health Demonstration Projects**  
**Lower Arkansas Valley Water Conservancy**  
**District**

July 2020 Board Meeting

**Water Plan Grant Application**



L O C A T I O N	
County/Countries:	Multiple
Drainage Basin:	Arkansas

D E T A I L S	
Total Project Cost:	\$354,650
Water Plan Grant Request:	\$100,000
Recommended Amount:	\$100,000
Other CWCB Funding:	\$0
Other Funding Amount:	\$0
Applicant Match:	\$254,650
Project Type(s):	Study, Demonstration Project
Project Category(Categories):	Agricultural
Measurable Result:	Agricultural water efficiency/conservation, engagement (100+)

The Lower Arkansas Valley Water Conservancy District is seeking financial support through the Colorado Water Plan Grant Program to expand Lower's existing soil health program to include soil health demonstration plots. The goal of the soil health demonstration project will be to work directly with regional producers to assess several effects through five United States Department of Agriculture-Natural Resource Conservation Service (NRCS) soil health practices, including cover crops, composting, and conservation tillage. Using reference, conventional plots Lower will measure various impacts associated with soil health practice adoption, including changes to water infiltration and soil water holding capacity, erosion rates, water quality carbon sequestration, and organic matter. Also, Lower will be conducting an economic analysis of soil health practice adoption, including measuring an increase in crop yield and return on investment.

The soil health demonstration project will also include additional components exploring aspects of alternative transfer methods and education and outreach. Information developed through the demo projects will inform Super Ditch operations to maintain healthy soil qualities of land fallowed as part of existing fallow-leasing pilot projects and could be informative to other water conservation programs. Lower will also be sharing results of the soil health demonstration projects through education workshops and field days, as well as directly with local NRCS staff. The soil health project will also be informative to other ongoing collaborations in the region, including the Lower Arkansas Water Quality Workgroup. The project will also be overseen by the program's advisory board, which consists of representatives from the U.S. Environmental Protection Agency, Colorado Department of Public Health and Environment, and the Colorado Department of Agriculture.

Staff recommends Board approval of the full grant amount requested and will continue to work with the applicants to share results with the broader agricultural community. The CWP Agricultural Project review committee found that this project conforms well to the Framework for State of Colorado Support for Water Projects outlined in the Colorado Water Plan and meets several of the CWP agricultural project evaluation criteria. The Colorado Water Plan supports the broader implementation of soil health practices, such as low tillage, mulching, and cover crops as a tool to conserve water and enhance drought resiliency. These practices have been proven to increase organic matter in the soil, which reduces soil moisture loss and help farmers maintain crop yield when supplies are limited. The Colorado Water Plan also supports solutions to address the effects of climate change on water resources, protection of ecosystem services, and exploring innovative financing mechanisms to further CWP critical actions. This project helps further several of these objectives, and support could help develop a scalable model for other parts of the state.

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<b>Colorado Water Conservation Board</b>
<b>Water Plan Grant Application</b>

Instructions		
<p>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.</p> <p>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:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;">                 Water Storage Projects                  Conservation, Land Use Planning                  Engagement &amp; Innovation Activities                  Agricultural Projects                  Environmental &amp; Recreation                  Projects             </td> <td style="width: 50%; vertical-align: top;">                 Anna.Mauss@state.co.us                  Kevin.Reidy@state.co.us                  Ben.Wade@state.co.us                  Alexander.Funk@state.co.us                  Chris.Sturm@state.co.us             </td> </tr> </table> <p><b>FINAL SUBMISSION:</b> Submit all application materials in one email to <a href="mailto:waterplan.grants@state.co.us"><u>waterplan.grants@state.co.us</u></a> 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.</p>	Water Storage Projects Conservation, Land Use Planning Engagement & Innovation Activities Agricultural Projects Environmental & Recreation Projects	Anna.Mauss@state.co.us Kevin.Reidy@state.co.us Ben.Wade@state.co.us Alexander.Funk@state.co.us Chris.Sturm@state.co.us
Water Storage Projects Conservation, Land Use Planning Engagement & Innovation Activities Agricultural Projects Environmental & Recreation Projects	Anna.Mauss@state.co.us Kevin.Reidy@state.co.us Ben.Wade@state.co.us Alexander.Funk@state.co.us Chris.Sturm@state.co.us	

Water Project Summary	
Name of Applicant	Lower Arkansas Valley Water Conservancy District
Name of Water Project	Soil Health Demonstration Plots
CWP Grant Request Amount	\$ 100,000
Other Funding Sources _____	\$
Other Funding Sources _____	\$
Other Funding Sources _____	\$
Applicant Funding Contribution	\$ 254,650
<b>Total Project Cost</b>	<b>\$ 354,650</b>



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<b>Applicant &amp; Grantee Information</b>	
Name of Grantee(s)	<a href="#">Lower Arkansas Valley Water Conservancy District</a>
Mailing Address	<a href="#">801 Swink Ave, Rocky Ford, CO 81067</a>
FEIN	<a href="#">48-1298144</a>
Organization Contact	<a href="#">Amber Weber</a>
Position/Title	<a href="#">Soil Health Director</a>
Email	<a href="mailto:arkvalleywps@gmail.com">arkvalleywps@gmail.com</a>
Phone	<a href="#">719-688-9941</a>
Grant Management Contact	<a href="#">Brenda Fillmore</a>
Position/Title	<a href="#">Finance Manager</a>
Email	<a href="mailto:bfillmore@lowerark.com">bfillmore@lowerark.com</a>
Phone	<a href="#">719-254-5115</a>
Name of Applicant (if different than grantee)	
Mailing Address	
Position/Title	
Email	
Phone	
<b>Description of Grantee/Applicant</b>	
Provide a brief description of the grantee's organization (100 words or less).	
<p>Lower Arkansas Valley Water Conservancy District (Lower Ark) was formed in 2002 by a vote of the people and now represents Bent, Crowley, Otero, Pueblo, and Prowers counties. Lower Ark's mission is to "To acquire, retain and conserve water resources within the Lower Arkansas River; To encourage the use of such water for the socio-economic benefit of the District citizens. To participate in water-related projects that will embody thoughtful conservation, responsible growth, and beneficial water usage within the Lower Arkansas Valley" and this is done with projects relating to water quantity, quality, conservation easements, and soil health practices to maintain water rights in the area.</p>	



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Type of Eligible Entity (check one)	
	<b>Public (Government):</b> 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.
X	<b>Public (Districts):</b> Authorities, Title 32/special districts (conservancy, conservation, and irrigation districts), and water activity enterprises.
	<b>Private Incorporated:</b> Mutual ditch companies, homeowners associations, corporations.
	<b>Private Individuals, Partnerships, and Sole Proprietors:</b> Private parties may be eligible for funding.
	<b>Non-governmental organizations (NGO):</b> Organization that is not part of the government and is non-profit in nature.
	<b>Covered Entity:</b> As defined in <a href="#">Section 37-60-126 Colorado Revised Statutes</a> .

Type of Water Project (check all that apply)	
	Study
	Construction
	Identified Projects and Processes (IPP)
X	Other: <a href="#">Demonstration Plots</a>

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. <i>Applicable Exhibit A Task(s):</i>
	Conservation and Land Use Planning - Activities and projects that implement long-term strategies for conservation, land use, and drought planning. <i>Applicable Exhibit A Task(s):</i>
	Engagement & Innovation - Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website. <i>Applicable Exhibit A Task(s):</i>
X	Agricultural - Projects that provide technical assistance and improve agricultural efficiency. <i>Applicable Exhibit A Task(s):</i>
	Environmental & Recreation - Projects that promote watershed health, environmental health, and recreation. <i>Applicable Exhibit A Task(s):</i>
	Other      Explain:

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<b>Location of Water Project</b>	
Please provide the general county and coordinates of the proposed project below in <b>decimal degrees</b> . The Applicant shall also provide, in Exhibit C, a site map if applicable.	
County/Countries	Prowers, Bent, Otero, and Pueblo Counties
Latitude	See Exhibit C
Longitude	See Exhibit C

<b>Water Project Overview</b>
<p>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.</p> <p>The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, Other Funding Sources/Amounts and Schedule.</p>
<p>Soil health has become a term that is both widely misunderstood and yet vastly accepted by many across the nation with a large push from entities such as the South Dakota Voices for Soil Health, Colorado Department of Agriculture (CDA), and NRCS, with a limited acceptance rate in the Arkansas Basin of Colorado. Demonstration plots have been used nationwide to quantify results tied to Best Management Practices, BMPs, but these out of state research plots are not readily adaptable to the unique conditions and the Arkansas River Compact of the lower Arkansas River basin. With stringent water rights, an arid landscape, and late adopters, this multi-dimensional demonstration plot project will provide a quantifiable link to BMPs installed with research tied to water quality as well as economic benefits (yield, inputs, time, etc.) for the producer.</p> <p>These demonstration plots will be equipped with measuring devices and equipment to verify year-by-year water and crop production data, erosion factors, among other data and each plot will be driven by the producers. These farmers will open their plots and time up for education to other local stakeholders and peers. In order to make this project a success, there will be a demonstration plot placed on a water-long ditch, water-short ditch, dryland farm, and natural grass grazing operations. This work will have multiple benefits and data collection pieces that include water quality, water management and usage, drought tolerance, wind and water erosion, and high nutrient consumption rates by the crops, and conservation.</p>

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<b>Measurable Results</b>	
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)
2.5 inches/hr of infiltration and 10% of economic savings on the bottom line	Efficiency Savings (indicate acre-feet/year OR dollars/year)
	Area of Restored or Preserved Habitat (acres)
	Quantity of Water Shared through Alternative Transfer Mechanisms
100+	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
	Number of Coloradans Impacted by Engagement Activity
	Other    Explain:

<b>Water Project Justification</b>
<p>Provide a description of how this water project supports the goals of <a href="#">Colorado's Water Plan</a>, the most recent <a href="#">Statewide Water Supply Initiative</a>, and the applicable Roundtable <a href="#">Basin Implementation Plan</a> and <a href="#">Education Action Plan</a>. 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).</p> <p>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;)</p> <p>This project is in line with both the Colorado Water Plan and the Basin Implementation Plan for the aspect of water supply management for meeting the water gaps in the basin. With the most recent technical update from Colorado Water Conservation Board, the Arkansas Basin is faced with a project agricultural gap of 600,000 ac-ft of water per year. Anything that can be done to meet this gap will be beneficial and help take pressure off agriculture production. In studies performed by institutions across the United States and backed by NRCS, increased organic matter and mycorrhizal fungi will lead to higher water and nutrient holding capacity and in turn, will lead to better crop quality/production, conservation of water, and better nutrient management to improve water quality. This effort will then play a factor in being able to use water more effectively when it is available in the forms of rain or direct diversion from the river.</p>



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### 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.

Lower Ark is currently working with Colorado Department of Health and Environment to see how cover crops, reduced tillage, and reduced fertilizer can affect crop production. These projects are small and on private land and this grant will be used to expand on this work's variety and water-type systems as well as hosting field days for educational purposes. These test plots will be fully run by producers with the technical assistance of Lower Ark. The Lower Arkansas Valley Water Conservancy District will then use this effort to work with Super Ditch to help with wind and soil erosion on fallowed fields during the projects already implemented and funded through the CWCB. A full technical aspect of work will help with soil erosion moving forward with Super Ditch as better management can help produce better plots for production during the fallow periods. Lower Ark is also working with the Lower Ark Water Quality Working Group to develop a map that will outline the hot spots for selenium, nitrate, and phosphate loading. This work will help identify high need areas that then can show stream impacts to downstream users by reducing the loading of high concentration contaminants to the river.

### 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.

Below is a list of four recent grants received by Lower Ark:

1. Lower Ark, Pond Seepage Study, Water Plan Grant Arkansas Basin, 10/18, POGG1 PDAA 201900002523, \$60,250.00 with 50% match
2. Lower Ark, John Martin Reservoir Phase II, Water Plan Grant Arkansas Basin, 02/18, POGG1 PDAA 201800000672, \$25,00.00 with 50% match
3. Lower Ark, North La Junta Phase II, Water Supply Reserve Grant Arkansas Basin, 10/17, POGG1 PDAA 201700000439, \$80,00.00 with 35% match
4. Lower Ark, Tailwater Phase II, Water Supply Reserve Grant Arkansas Basin, 10/17, CTGG1 2017-1656, \$174,796.00 with 40% match

See attached grants list for more approved grants.

### 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.

Lower Ark is Tabor exempt.



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

(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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## ENGAGEMENT & INNOVATION GRANT FUND SUPPLEMENTAL APPLICATION

### Introduction & Purpose

Colorado’s Water Plan calls for an outreach, education, public engagement, and innovation grant fund in Chapter 9.5.

The overall goal of the Engagement & Innovation Grant Fund is to enhance Colorado’s water communication, outreach, education, and public engagement efforts; advance Colorado’s water supply planning process; and support a statewide water innovation ecosystem.

The grant fund aims to engage the public to promote well-informed community discourse regarding balanced water solutions statewide. The grant fund aims to support water innovation in Colorado. The grant fund prioritizes measuring and evaluating the success of programs, projects, and initiatives. The grant fund prioritizes efforts designed using research, data, and best practices. The grant fund prioritizes a commitment to collaboration and community engagement. The grant fund will support local and statewide efforts.

The grant fund is divided into two tracks: engagement and innovation. The Engagement Track supports education, outreach, communication, and public participation efforts related to water. The Innovation Track supports efforts that advance the water innovation ecosystem in Colorado.

### Application Questions

\*The grant fund request is referred to as “project” in this application.

Overview (answer for both tracks)
In a few sentences, what is the overall goal of this project? How does it achieve the stated purpose of this grant fund (above)?
Who is/are the target audience(s)? How will you reach them? How will you involve the community?
Describe how the project is collaborative or engages a diverse group of stakeholders. Who are the partners in the project? Do you have other funding partners or sources?



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Overview (answer for both tracks)
Describe how you plan to measure and evaluate the success and impact of the project?
What research, evidence, and data support your project?
Describe potential short- and long-term challenges with this project.

Please fill out the applicable questions for either the Engagement Track or Innovation Track, unless your project contains elements in both tracks. If a question does not relate to your project, just leave it blank. Please answer each question that relates to your project. Please reference the relevant documents and use chapters and page numbers (Colorado's Water Plan, Basin Implementation Plan, PEPO Education Action Plan, etc.).

Engagement Track
Describe how the project achieves the education, outreach, and public engagement measurable objective set forth in Colorado's Water Plan to "significantly improve the level of public awareness and engagement regarding water issues statewide by 2020, as determined by water awareness surveys."
Describe how the project achieves the other measurable objectives and critical goals and actions laid out in Colorado's Water Plan around the supply and demand gap; conservation; land use; agriculture; storage; watershed health, environment, and recreation; funding; and additional.
Describe how the project achieves the education, outreach, and public engagement goals set forth in the applicable Basin Implementation Plan(s).

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Describe how the project achieves the basin roundtable's PEPO Education Action Plans.

Innovation Track
Describe how the project enhances water innovation efforts and supports a water innovation ecosystem in Colorado.
Describe how the project engages/leverages Colorado's innovation community to help solve our state's water challenges.
Describe how the project helps advance or develop a solution to a water need identified through TAP-IN and other water innovation challenges. What is the problem/need/challenge?
Describe how this project impacts current or emerging trends; technologies; clusters, sectors, or groups in water innovation.

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<b>Colorado Water Conservation Board</b>
<b>Water Plan Grant - Exhibit A</b>

<b>Statement Of Work</b>
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<b>Date:</b>	<b>December 1, 2019</b>
<b>Name of Grantee:</b>	<b>Lower Arkansas Valley Water Conservancy District</b>
<b>Name of Water Project:</b>	<b>Soil Health Demonstration Plots</b>
<b>Funding Source:</b>	<b>Agricultural Projects - Water Plan Grant</b>

<b>Water Project Overview:</b>
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Lower Ark will be implementing four soil health demonstration plots across the Arkansas Basin to look at the effectiveness of improving soil health through the five identified practices of NRCS (living root, incorporate livestock, no disturbance, coverage year-round, and diversity). In the semi-arid environment of the Arkansas Basin, these practices have accentuated the hidden culture that these practices not possible, profitable, or productive. These demonstration plots will prove it is possible and that soil health practices have merit in the water world and on farms in this specific region. These practices have been adopted by Colorado Department of Agriculture and demonstration plots are needed to prove the viability of the work. Lower Ark will be using producer-led plots of 100 acres that can be split in half or into strips to show effective soil health practices such as cover cropping, composting, synthetic input reduction, etc. A weather station will be placed in the center of each plot to supplement the soil moisture probes and artesian wells' data to technically show the effectiveness of the project by more accurately accounting for erosion factors, precipitation, etc. In order to measure success, soil samples will be taken and analyzed using the Haney and Conventional soil tests to show increased mycorrhizal fungi and organic matter and then will be coupled with economic analysis of the farm production. Economics is not a direct correlation of yield, but an in-depth look at time, inputs (fuel, time/labor, seed, etc.) and will research the bottom line of improving soil health from the input and outputs combined for each farmer in their plot. Following the implementation of these projects, a series of field tours or field days will be used to display the research to other local farmers. A culmination of producer-driven work with technical assistance from Lower Ark will help drive the project and show effectiveness for the state of Colorado including the Department of Agriculture and NRCS. By the end of the project, these demonstration plots will be similar to the Voices of Soil Health for South Dakota with technical assistance similar to Dakota Lakes.

<b>Project Objectives:</b>
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- **Develop four producer-led soil health demonstration plots**
- **Analyze economic, quantitative, and qualitative success of soil health practices**
- **Technically synthesize the water consumption and quality of soil health practices**
- **Display soil health effectiveness through field days**
- **Develop a farmer-led network of resources for future projects**

Tasks
<b>Task 1 – Development of Soil Health Test Plots</b>
Description of Task:
<p>Four demonstration sites will be selected and implemented. The four sites will be under one of the following conditions:</p> <ul style="list-style-type: none"> <li>• A dryland farm in Prowers County</li> <li>• A native grass grazing farm in Pueblo County</li> <li>• A water-long test plot under the Catlin Canal</li> <li>• A water-short test plot under the Fort Lyon Canal</li> </ul> <p>There are a list of farmers Lower Ark has been working with under each of these scenarios and an exact location will be made following the approval of the grant. The test plot then will be split in half with a weather station placed in the center of the field. On one half of the field, farming practices will continue as normal, and will act as the control, and on the other soil health practices will be implemented. This side of the parcel will be a multi-variable test plot, including no more than four variables such as limited or no tillage, diversity of crops, rotational grazing, composting or reducing of synthetic inputs, keeping the ground covered when traditionally not covered, and pollinator strips/plots. On-field monitoring of both water quality and soil organic matter, among other tests, will occur on the field including both the “control” and the test acreage to ensure adequate and comparable measurements are taken to truly quantify the BMP changes on each parcel while learning what is viable for the landscape and economics of each farm/ranch. It would be ideal to develop single variable test plots with multiple strips and show one single aspect such as cover crops on one strip, no-till on another, grazing, and so on, but with answers that need to be made quickly it is ideal to identify multivariable plots and gather as much data as possible. This also will limit the amount of monitoring and technical assistance needed. Future demonstration sites will be needed to implement single variable plots.</p> <p>Producers will be involved in identifying these plots on their land and will be experts while Lower Ark will provide the technical assistance in helping to improve organic matter and fungi which has been mined from the soils over the years. The goal will be to show increased organic matter with reduced inputs on a year by year basis while showing economic improvement, not necessarily directly linked to yield.</p>
Method/Procedure:



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Tasks	
	<ul style="list-style-type: none"><li>• Identify and implement four producer-led demonstration plots with technical assistance from Lower Ark.</li><li>• Implement soil health and water quality monitoring practices.</li><li>• Develop a farm plan/agreement on half of each demo plot to help improve soil health</li><li>• Perform economic analysis on each demo plot to show side by side results from the control and test plots.</li></ul>
Deliverable:	
<p>A list of the identified parcels of land that will be used for the demonstration plots without identifying individual farmers by name, an agreement between the farmer/rancher and Lower Ark will include the BMPs, timeline, and basic farm plan. After identification and agreements have been established, economic analysis can begin with gathering historical data, putting this into a database, and entering all current data as it comes in.</p>	

Tasks	
<b>Task 2 – Soil and Water Quality Monitoring</b>	
Description of Task:	
<p>After identifying the exact location of the demonstration plots, a series of measurement devices will need to be installed. Soil moisture probes, weather stations, and artesian wells will be installed to allow for measurement of water holding and nutrient capacity while tracking water quality benefits. Items of interest to be measured are organic matter in the soil, nitrate, phosphate, selenium, and uranium in the water and maintained in the soil, and wind and soil erosion using weather stations and climate data. The organic matter is a direct correlation to carbon maintained in the soil which can lead to carb sequestration. The nitrate and phosphate levels play a vital role in Regulation 85 as Colorado is nearing a nonpoint source (ag) influence on impaired water bodies. Finally, the selenium and uranium are significant impairments and items of interest for both Kansas and Colorado Water Resources moving forward. Lower Ark will use interns to collect the data from these devices while also taking yearly soil samples and sending them off to be tested via conventional and Haney test methods. These tests will help identify the increase in organic matter and fungi that will be used to quantify the improved soil health.</p>	
Method/Procedure:	

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Tasks
<ul style="list-style-type: none"> <li>Using the CDPHE approved IPP and SAPP for water quality and soil testing, Lower Ark will take yearly soil samples at each test and control plot, monthly water quality samples, hourly soil moisture samples, and hourly weather data. This data will be used to show the yearly, monthly, and daily variances in elements on the demonstration plots.</li> <li>A development of a user-friendly database to produce graphs of all data collected and analyzed to go along with visual aid on each of the datasets will be developed.</li> </ul>
<p><b>Deliverable:</b></p> <p>A database of all data collected and compiled results will be entered into a database and will accompany a written report which will utilize technical assistance and be used as a knowledge sharing platform.</p>

Tasks
<p><b>Task 3 - Economic Analysis</b></p>
<p><b>Description of Task:</b></p> <p>One of the largest driving factors for agricultural production is how do can yields be increased to drive income.</p> <p>Typically, a non-producer considers “good production” or most of a farmer’s profit in terms of yield, but Lower Ark knows that economics goes much deeper than that and takes many measurements and much analysis. After the economic analysis, the farmer will be able to hold dialogue that may show that perhaps yields were down, but so were his inputs and therefore he made money. Showing economics in a usable format may also allow for changes in practice long-term or across more acres that will allow the soil profile to be full at the most opportune times with live nutrients and in a fashion to raise a strong, healthy crop. Economic analysis will be the biggest key to getting other producers to understand that healthy soils leads to healthy living and budget.</p>
<p><b>Method/Procedure:</b></p>



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Tasks
<ul style="list-style-type: none"> <li>Produce a database with multiple data points on a year by year basis for each of the demonstration plots. Because each year is highly variable for water delivery, precipitation, and crop prices, this will be done on each parcel of multi-variable test plots. Using data, programs, and economics, the return on investment can be calculated which in turn can help banks understand what is truly being accomplished on the farm and what the farmer can do to make his/her farm more productive and sustainable.</li> </ul>
<p><b>Deliverable:</b></p> <p>A written economics report for each farmer based on their specific variables and inputs/outputs will be put together.</p>

Tasks
<p><b>Task 4 - Field Days</b></p>
<p><b>Description of Task:</b></p> <p>Once the demonstration plots are established, field days will be used to show other producers, stakeholders, and funders, what is viable in this region. Field days will be used to garner more producer-driven practices to help keep agriculture worthwhile in the valley. Additional field days will be used to show CWCB and the Colorado Department of Agriculture what has been done on the demonstration plots and what was accomplished. All the work will need to be on display if more producers are to get on board with saving their soils to reduce soil and wind erosion and better management of water resources. Many of the invited participants will include NRCS staff, local producers, Department of Ag, CDPHE, local bankers, local conservation districts, and CSU extension employees. The invites will encourage the adoption of similar practices in the valley to be used by EQUIP certified farms as well as conservation districts cover crop adoption.</p>

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Tasks
<p>Method/Procedure:</p> <ul style="list-style-type: none"> <li>Put on several field days throughout the growing seasons where producers, stakeholders, and funders will be invited and can physically go out into the field to get dirty and see how the soil is working for the advancement of the producer. Having technical assistance available to answer any economic or soil holding capacity questions.</li> </ul>
<p>Deliverable:</p> <p>A written report of the attendees, topics, and general success will be written for the culmination of the field days.</p>

Tasks
<p><b>Task 5 - Success Stories</b></p>
<p>Description of Task:</p>

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Tasks
<p>After monitoring the demonstration plots, many of the success stories will need to be documented for distribution to other producers, the Colorado Department of Agriculture, Colorado Water Conservation Board and other funders, stakeholders, and interested parties. These success stories will be the qualitative piece to the data collection. Distribution of these successes will then be given to the appropriate sources for further demonstration plots or adaptation of soil health practices.</p>
<p>Method/Procedure:</p> <ul style="list-style-type: none"> <li>• Short testimonies from the producers will be documented in a brochure or pamphlet for easy to read information. These brochures then can be transformed into a working database, story map, or even pod casts to be distributed on Lower Arks Soil Health website: <a href="http://www.coloradosoilhealth.org">www.coloradosoilhealth.org</a>.</li> <li>• With technical support to back up these testimonies, other producers will be able to read about the economic driving forces for implementing BMPs of their own to increase organic matter, water holding capacity, and the living ecosystem for an overall soil health benefit.</li> <li>• The use if these success stories will also be distributed to expand the demonstration plots and look at furthering adaptation of soil health practices.</li> <li>• A report to the Arkansas Basin Roundtable with success stories will be presented.</li> </ul>
<p>Deliverable:</p> <p>Testimonies will be posted to the website and handed out during any type of field day or workshop.</p>

Tasks
<b>Task 6 – Grant Management</b>

Last Updated: July 2019

<b>Tasks</b>	
<b>Description of Task:</b>	Oversite of the project progression, including 6-month progress reporting, technical analysis reporting, and final reporting will be written and delivered. This will require farm visits to the demonstration plots, budget tracking to ensure the money is spent accordingly and accurately, writing progress and final reports, and staying on top of all technical assistance to deliver a thorough analysis of all work completed.
<b>Method/Procedure:</b>	Communication between the producer, technical assistant/engineer, and CWCB will be maintained. Development of all reports will be distributed on time and in order. The arrangement of all field days to display the work completed will be hosted and necessary attendees will be invited.
<b>Deliverable:</b>	Six month and final report documents documenting all work completed and all necessary supplemental information such as pictures, graphs, maps, etc.

<b>Budget and Schedule</b>	
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.	

Last Updated: July 2019

### 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.

### 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.

Last Updated: July 2019

<b>Performance Measures</b>



**COLORADO**  
Colorado Water  
Conservation Board  
Department of Natural Resources

## Colorado Water Conservation Board

### Water Plan Grant - Exhibit B Budget Template Instructions

**\*\* Please select the most appropriate budget template for your project from the worksheet tabs below. A general budget template is provided, as well as templates for studies, construction, and engineering projects.\*\***





**Colorado Water Conservation Board**

**Water Plan Grant - Exhibit B  
 Budget and Schedule**

**Prepared Date: December 1 ,2019**

**Name of Applicant: Lower Arkansas Valley Water Conservancy District**

**Name of Water Project: Soil Health Demonstration Plots**

**Project Start Date: November 1, 2020**

**Project End Date: December 31, 2023**

<b>Task No.</b>	<b>Task Description</b>	<b>Task Start Date</b>	<b>Task End Date</b>	<b>Grant Funding Request</b>	<b>Match Funding</b>	<b>Total</b>
1	Development of Soil Health Demo Plots	NTP	12/31/2023	\$34,000.00	\$72,625.00	\$106,625
2	Soil and Water Quality Monitoring	NTP	12/31/2023	\$52,250.00	\$107,625.00	\$159,875
3	Economic Analysis	1/1/2021	12/31/2023	\$11,000.00	\$29,900.00	\$40,900
4	Field Days	1/1/2021	12/31/2023	\$0.00	\$17,000.00	\$17,000
5	Success Stories	1/1/2022	12/31/2023	\$2,750.00	\$17,625.00	\$20,000
6	Grant Management	NTP	12/31/2023	\$0.00	\$15,000.00	\$15,000
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
<b>Total</b>				\$100,000	\$259,775	\$359,400

**Colorado Water Conservation Board**  
**Water Plan Grant - Detailed Budget Estimate**  
**Fair and Reasonable Estimate**

Prepared Date: 1-Dec-19  
Name of Applicant: Lower Arkansas Valley Water Conservancy District  
Name of Water Project: Soil Health Demonstration Plots

Item	Hourly Rate	# Hours	Sub-total	Item Cost	Item Quantity	Sub-total	Total	CWCB Funds	Matching Funds
<b>Task 1 - Development of Soil Health Demo Plots</b>									
Selection of Test Plots									
Soil Health Director	\$ 75.00	30	\$ 2,250.00				\$ 106,625.00	\$ 34,000.00	\$ 72,625.00
Engineer/Technical Assistance	\$ 75.00	15	\$ 1,125.00				\$ 3,375.00	\$ -	\$ 3,375.00
Development of Test Plots									
Soil Health Director	\$ 75.00	250	\$ 18,750.00				\$ 2,250.00	\$ -	\$ 2,250.00
Engineer/Technical Assistance	\$ 75.00	100	\$ 7,500.00				\$ 1,125.00	\$ -	\$ 1,125.00
Economics Director	\$ 50.00	100	\$ 5,000.00				\$ 103,250.00	\$ 34,000.00	\$ 69,250.00
Cover Crops or diversification (per acre)				\$ 35.00	1200.00	\$ 42,000.00	\$ 18,750.00	\$ 7,000.00	\$ 11,750.00
Fertilizer Reduction (per acre)				\$ 50.00	600.00	\$ 30,000.00	\$ 7,500.00	\$ -	\$ 7,500.00
							\$ 5,000.00	\$ -	\$ 5,000.00
							\$ 42,000.00	\$ 15,000.00	\$ 27,000.00
							\$ 30,000.00	\$ 12,000.00	\$ 18,000.00
<b>Task 2 - Soil and Water Quality Monitoring</b>									
Equipment Purchase and Installation									
Soil Health Director	\$ 75.00	30	\$ 2,250.00				\$ 159,875.00	\$ 52,250.00	\$ 107,625.00
Engineer/Technical Assistance	\$ 75.00	50	\$ 3,750.00				\$ 39,500.00	\$ 12,250.00	\$ 27,250.00
Interns	\$ 25.00	100	\$ 2,500.00				\$ 2,250.00	\$ -	\$ 2,250.00
Weather Stations and soil moisture probe network				\$ 6,500.00	4.00	\$ 26,000.00	\$ 3,750.00	\$ -	\$ 3,750.00
Artesian Wells				\$ 1,000.00	5.00	\$ 5,000.00	\$ 2,500.00	\$ -	\$ 2,500.00
Monitoring and Reporting									
Soil Health Director	\$ 75.00	100	\$ 7,500.00				\$ 2,500.00	\$ -	\$ 2,500.00
Engineer/Technical Assistance	\$ 75.00	250	\$ 18,750.00				\$ 7,500.00	\$ -	\$ 7,500.00
Economics Director	\$ 50.00	100	\$ 5,000.00				\$ 18,750.00	\$ -	\$ 18,750.00
Interns	\$ 25.00	205	\$ 5,125.00				\$ 5,000.00	\$ -	\$ 5,000.00
Soil Sampling				\$ 100.00	300.00	\$ 30,000.00	\$ 5,125.00	\$ -	\$ 5,125.00
Water Sampling				\$ 150.00	360.00	\$ 54,000.00	\$ 30,000.00	\$ 15,000.00	\$ 15,000.00
							\$ 54,000.00	\$ 25,000.00	\$ 29,000.00
<b>Task 3 - Economic Analysis</b>									
Development of Economic Analysis									
Soil Health Director	\$ 75.00	50	\$ 3,750.00				\$ 40,900.00	\$ 11,000.00	\$ 29,900.00
Engineer/Technical Assistance	\$ 75.00	20	\$ 1,500.00				\$ 36,400.00	\$ 11,000.00	\$ 25,400.00
Economics Director	\$ 75.00	400	\$ 30,000.00				\$ 3,750.00	\$ 1,000.00	\$ 2,750.00
Interns	\$ 25.00	46	\$ 1,150.00				\$ 1,500.00	\$ -	\$ 1,500.00
Reporting of Economic Analysis									
Soil Health Director	\$ 75.00	20	\$ 1,500.00				\$ 30,000.00	\$ 10,000.00	\$ 20,000.00
Engineer/Technical Assistance	\$ 75.00	20	\$ 1,500.00				\$ 1,150.00	\$ -	\$ 1,150.00
Economics Director	\$ 75.00	20	\$ 1,500.00				\$ 4,500.00	\$ -	\$ 4,500.00
<b>Task 4 - Field Days</b>									
Development of Field Days									
Soil Health Director	\$ 75.00	100	\$ 7,500.00				\$ 7,500.00	\$ -	\$ 7,500.00
Interns	\$ 25.00	50	\$ 1,250.00				\$ 1,250.00	\$ -	\$ 1,250.00
Advertisement				\$ 200.00	10.00	\$ 2,000.00	\$ 2,000.00	\$ -	\$ 2,000.00
Execution of Field Days and Reporting									
Soil Health Director	\$ 75.00	50	\$ 3,750.00				\$ 6,250.00	\$ -	\$ 6,250.00
Engineer/Technical Assistance	\$ 75.00	20	\$ 1,500.00				\$ 3,750.00	\$ -	\$ 3,750.00
Economics Director	\$ 50.00	20	\$ 1,000.00				\$ 1,500.00	\$ -	\$ 1,500.00
<b>Task 5 - Success Stories</b>									
Development of Success Stories									
Soil Health Director	\$ 75.00	100	\$ 7,500.00				\$ 15,250.00	\$ 2,750.00	\$ 20,000.00
Engineer/Technical Assistance	\$ 75.00	20	\$ 1,500.00				\$ 9,750.00	\$ 2,750.00	\$ 7,000.00
Interns	\$ 25.00	30	\$ 750.00				\$ 7,500.00	\$ 2,000.00	\$ 5,500.00
Display of Stories on Website/Development of Brochures									
Soil Health Director	\$ 75.00	100	\$ 7,500.00				\$ 1,500.00	\$ -	\$ 1,500.00
Interns	\$ 25.00	20	\$ 500.00				\$ 750.00	\$ 750.00	\$ -
Printing				\$ 10.00	500.00	\$ 5,000.00	\$ 5,500.00	\$ -	\$ 13,000.00
							\$ -	\$ -	\$ 7,500.00
							\$ 500.00	\$ -	\$ 500.00
							\$ 5,000.00	\$ -	\$ 5,000.00
<b>Task 6 - Grant Management</b>									
Reporting and Management									
Soil Health Director	\$ 75.00	200	\$ 15,000.00				\$ 15,000.00	\$ -	\$ 15,000.00
<b>TOTAL</b>									
							\$ 354,650.00	\$ 100,000.00	\$ 262,150.00
Other Direct Costs (see below)							\$ -	\$ -	\$ -
<b>OVERALL TOTAL</b>							\$ 354,650.00	\$ 100,000.00	\$ 262,150.00

Item:	Copies & Printing (Black & White)	Copies & Printing (Color)	Materials and Final Report Production Lump Sum	Mileage	Total
Units:	No.	No.		Miles	
Project Development and Execution					\$0.00
Producer Reports					\$0.00
Report, Conclusions and Recommendations					\$0.00
<b>Total Units:</b>	0	0	0	0	\$0.00
<b>Total Cost:</b>	\$0	\$0	\$0	\$0	\$0



Figure 1: Map of Identified Areas for Demonstration Plots



Figure 2: Weather Stations to be Implemented on the Demonstration Plots





Figure 3: Soil Moisture Probes to be Implemented on the Demonstration Plots



Figure 4: Artesian Wells to be Implemented on the Demonstration Plots

# Arkansas Basin Roundtable

January 28, 2020

***Via Electronic Mail: [ben.wade@state.co.us](mailto:ben.wade@state.co.us)***

Mr. Ben Wade  
Colorado Water Conservation  
Board 1313 Sherman Street,  
Room 721  
Denver, CO 80203

Re: Water Plan Grant Application: Lower Arkansas Valley Water Conservancy District Soil Health Demonstration Plots

Dear Ben:

At its January 8, 2020 meeting, the Arkansas Basin Roundtable (ABRT) approved support of the Lower Arkansas Valley Water Conservancy District Soil Health Demonstration Plots Water Plan Grant application for \$200,000 in Statewide Funds.

The applicant is providing \$200,000 in matching funds. This project supports the goals of the Colorado Water Plan and the Arkansas Basin Implementation Plan by utilizing water supply management for meeting the water gaps in the Basin. According to the most recent technical update from the Colorado Water Conservation Board, the Arkansas Basin is faced with an agricultural gap of 600,000 ac-ft. of water per year. The use of the demonstration plots will be beneficial to meet the gap and evaluate efficiencies to be gained in agricultural production.

This project involves demonstration plots equipped with measuring devices to be placed on water-long ditches, water-short ditches, dryland farms and natural grass grazing operations resulting in data collection to include water quality, water management and usage, drought tolerance, wind and water erosion, and high nutrient consumption rates by crops and conservation. The ABRT approved supporting this application by consensus and there were no dissenting views.

Should you have any questions or concerns, please feel free to contact me either by telephone, 719-668- 8028, or by email, [mshea@csu.org](mailto:mshea@csu.org).

  
Mark Shea  
Chair

Copy via email: Applicant; Abby Ortega, Needs Assessment Chair