COLORADO
Colorado Water Conservation Board
Department of Natural Resources
1313 Sherman Street, Room 718
Denver, CO 80203

Rio Grande – SLV Recharge Optimization Pilot Project
POGG1 2019-2697

February 19, 2019

Mosca-Hooper Conservation District
Attn: Patrick O'Neil, Board Supervisor
101 S. Craft Drive
Alamosa, CO 81101

Dear Grantee:

We are pleased to inform you that the Colorado Department of Natural Resources, Colorado Water Conservation Board (CWCB) has approved your request for funding pursuant to the WSRF Grant Program ("Program"). This letter authorizes you to proceed with the SLV Recharge Optimization Pilot Project ("Project") in accordance with the terms of this Grant Award Letter.

Attached to this letter are the terms and conditions of your Grant. Please review these terms and conditions, as they are requirements of this Grant to which you, Mosca-Hooper Conservation District, agree by accepting the Grant Funds.

The WSRF Criteria & Guidelines can be located on our website for additional information. If you have any questions or concerns regarding the project, please contact Megan Holcomb, Project Manager at 303-866-3441 or at Megan.Holcomb@state.co.us. Please send the 6-month progress reports and invoices directly to the Project Manager and cc me at Dori.vigil@state.co.us.

Thank you.

Sincerely,

//s//

Doriann Vigil
Program Assistant II
O 303-866-3441 ext. 3250
1313 Sherman Street, Rm. 719, Denver, CO 80203
Dori.vigil@state.co.us / cwcb.state.co.com

STATE OF COLORADO

Department of Natural Resources

ORDER

Number: POGG1,PDAA,201900002697

Date: 2/15/19

Description:

PDAA WSRA 2500 SLV Recharge Optimization_RG

Effective Date: 02/18/19

Expiration Date: 12/31/19

BUYER

Buyer:

Email:

VENDOR

MOSCA HOOPER CONSERVATION DIST
101 S CRAFT DR
ALAMOSA, CO 81101

Contact: .

Phone: .

*****IMPORTANT*****

The order number and line number must appear on all invoices, packing slips, cartons, and correspondence.

BILL TO

COLORADO WATER BOARD CONSERVATION
1313 SHERMAN STREET, ROOM 718
DENVER, CO 80203

SHIP TO

COLORADO WATER BOARD CONSERVATION
1313 SHERMAN STREET, ROOM 718
DENVER, CO 80203

SHIPPING INSTRUCTIONS

Delivery/Install Date: -

FOB: FOB Dest, Freight Allowed

VENDOR INSTRUCTIONS

EXTENDED DESCRIPTION

Line Item	Commodity/Item Code	UOM	QTY	Unit Cost	Total Cost	MSDS Req.
1	G1000		0	0.00	$43,100.00	☐

Description: PDAA WSRA 2500 SLV Recharge Optimization_RG

Service From: 02/19/19 Service To: 12/31/19

TERMS AND CONDITIONS

https://www.colorado.gov/pacific/osc/small-dollar-grant-award-terms-conditions

DOCUMENT TOTAL = $43,100.00

Last Update: January 9, 2018

Colorado Water Conservation Board	
Water Supply Reserve Fund	
Exhibit A - Statement of Work	
Date:	**10 Sep 2018**
Water Activity Name:	**SLV Recharge Optimization Pilot Project**
Grant Recipient:	**Mosca-Hooper Conservation District**
Funding Source:	**Basin Account**

Water Activity Overview: (Please provide brief description of the proposed water activity (no more than 200 words). Include a description of the overall water activity and specifically what the WSRF funding will be used for.

Mosca-Hooper Conservation District will begin a pilot hydrogeology study with Zeigler Geologic Consulting, LLC to complement information informing groundwater modeling in our region. WSRF funds for this pilot project will be used to deploy geophysical aquifer feature mapping with electrical resistivity technology within the unconfined aquifer system underlying Alamosa County as a township-scale proof-of-concept project. This mapping technology is used extensively in other regions of the U.S.A., but to date has not been deployed within the San Luis Valley. Unique features of the work proposed involve integrating electrical resistivity mapping of the depths of clay lenses and other potential physical barriers to groundwater recharge into regional groundwater recharge modeling to allow site-specific recharge management. This work will map depths from 5' to 40' below soil surface, a zone about which little is known in our region, but through which our intended recharge water must travel before meeting the saturated media of the unconfined aquifer. The mapping is intended to locate site-specific differences in impediments to recharge, information useful to water managers to allow surface water to be routed to locations where recharge has least impediments and greatest potential efficiency, effectively to hone in on optimal recharge "sweet spots".

Objectives: (List the objectives of the project)

- **Utilize existing groundwater recharge information, data sets, and local expertise to develop novel geophysical data and actionable information**
- **Map intensively the geophysical parameters of a township-scale study area, by combining traditional geological physical & chemical survey techniques, novel geophysical electrical resistivity imaging, and ground-truthing with monitoring well development within the study area**
- **Demonstrate the scalability of the aforementioned approach for identifying recharge "sweet spots" across the groundwater management region**
- **Increase awareness among landowners, water users, public officials and water administrators regarding recharge potential and the utility of coordinating recharge efforts**
- **Collaborate with local authorities, surface water, and groundwater users groups to facilitate targeted and impactful groundwater recharge**

Tasks
Provide a detailed description of each task using the following format:
Task 1 – Geologic Information
Description of Task: Geologic reconnaissance of targeted array sites
Geologic Information about the target area and its surroundings, including subsurface data. Groundwater is stored in and transmitted through porous and permeable rock types. It is important to know the geologic units present both at the surface and in the subsurface in order to know which rock units will be acting as aquifers and which may present barriers to groundwater flow. In addition, faulting, folding and paleotopography in the subsurface may cause aquifer units to occur at unexpected depths or be cut off from potential recharge. Anticipating where restrictive barriers exist (e.g. extent and shape of clay lenses) can aid in locating optimal groundwater recharge locations.
Method/Procedure: Survey of existing geologic data sets, interviews with landowners and well drillers, site visits for discovery of pertinent physical features of the study area and its surroundings

Last Update: January 9, 2018

Tasks
Review of geologic and hydrologic data publicly available will be continued. Interviews with landowners and well drillers active within the study area will be undertaken to gather detailed data on formation composition and site-specific characteristics relative to groundwater recharge potential. Site visits to determine geologic features potentially impactful to the quality of imagery generated by the electrical resistivity equipment to be deployed.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
Documentation of site's known and assessed characteristics based on geologic and hydrologic resources prior to geophysical electrical resistivity imaging equipment deployment.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
Understanding of the basis for site selection for geophysical equipment deployment within an unconfined aquifer system.

Tasks
Provide a detailed description of each task using the following format:
Task 2 – Geophysical Imaging & Development of Monitoring Wells
Description of Task: Electrical resistivity equipment rental, deployment, data processing, report preparation relating geophysical imaging approach; Development of monitoring wells to ground-truth the novel geophysical approach

Last Update: January 9, 2018

Tasks
Generation of geophysical imaging, utilizing highly specialized and very precise electrical resistivity equipment, will consume the grand majority of the project budget. The equipment rental, and the data collection and processing, are high-cost per field deployment, but also potentially high-impact expenditures. Completion of Task 1 is a critical component in refining the exact locations for the electrical resistivity equipment deployment. This will be paired with the drilling of monitoring wells within the study area to allow ground-truthing of the clay lenses imaged, and to allow monitoring of impact on aquifer static water levels when surface water is directed to the study area for recharge.
Method/Procedure: Electrical resistivity imaging; Well drilling utilizing split-spoon or other appropriate technology
Survey results from Task 1 will inform geophysical team where, within the township-scale study area, to locate the arrays of electrical sensors that will generate return-time data, to process into imagery depicting the location, thickness and extent of clay lenses from the 5' – 40' depths. Monitoring wells will be drilled utilizing split-spoon drilling or other similarly appropriate technology to allow cuttings from known depths to be extracted and logged, for comparison with the electrical resistivity out-put. These wells will further be used for monitoring of localized aquifer recharge events.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
Imagery useful for placement and shape of recharge structures. Validation of capacity and utility with which electrical resistivity imaging can predict presence of impediments to water movement through the 5' – 40' zone, through comparison with drill cuttings and the known properties of these materials.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
Understanding the utility of this methodology for locating buried features on a landscape which could influ-ence water recharge capacity on a site-specific basis.

Tasks
Provide a detailed description of each task using the following format:
Task 3 – Figures, Maps, MHCD Board Outreach & Education
Description of Task: Development of information from the data generated in the pilot project in media and formats accessible to general and specific audiences
Making accessible groundwater function information specific to what is currently understood about in-flow/outflow modeling, and what is to be learned from the targeted recharge approach evaluated herein, is a critical component of this project. Land managers, water users, administrators, local public officials, and residents of the region, all grapple with understanding how water moves between the soil surface and aq-uifer systems. Developing accessible figures, maps, outreach and educational materials and the means by which to navigate this data to generate informed decision-making and understanding for those engag-ing questions of water use and aquifer recharge.
Method/Procedure: Geographic information system to inform development of an interactive website; Pub-lic meeting presentations
Compilation of data from the study into publicly-meaningful formats. Website development to allow inter-active access of data from the study, incorporating base layers of other pertinent public data for integra-tion. Public presentations by the Mosca-Hooper Conservation District and its project partners to the Rio Grande Roundtable and to other interested audiences within our region.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)
Media and interactive website for use locally and regionally when interacting with the public regarding aq-uifer function, relative to targeted recharge.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)

Tasks
Same as aforementioned, as a case-study example from the San Luis Valley.

Tasks
Provide a detailed description of each task using the following format:
Task 4 – Grant Administration
Description of Task: Contractor management and reporting of results
Mosca-Hooper Conservation District Manager will oversee timelines, contractor engagement and activity, and required reporting from outset to completion of the pilot project.
Method/Procedure: Administrative staff to implement project management
Mosca-Hooper Conservation District's manager is a highly capable, very effective communicator and project manager. Clear expectations, timelines, budget management and report writing are all strong skills possessed by the manager.
Grantee Deliverable: (Describe the deliverable the grantee expects from this task)

Last Update: January 9, 2018

Tasks
Well-administered project with accompanying reporting to relate allocation of resources and findings.
CWCB Deliverable: (Describe the deliverable the grantee will provide CWCB documenting the completion of this task)
Same as aforementioned, to accompany regional case-study from the San Luis Valley.

Budget and Schedule
Exhibit B - 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. A separate excel formatted Budget is required for engineering costs to include rate and unit costs.

Reporting Requirements
Progress Reports: The grantee 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. The CWCB may withhold reimbursement until satisfactory progress reports have been submitted.
Final Report: At completion of the project, the grantee shall provide the CWCB a Final Report on the grantee'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.
Payments

Last Update: January 9, 2018

Reporting Requirements

Payment will be made based on actual expenditures, must include invoices for all work completed and must be on grantee's letterhead. 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.

The CWCB will pay the last 10% of the entire water activity 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 water activity and purchase order or contract will be closed without any further payment. Any entity that fails to complete a satisfactory Final Report and submit to CWCB within 90 days of the expiration of a purchase order or contract may be denied consideration for future funding of any type from CWCB.

Performance Requirements

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 Grant Guidelines, the CWCB will pay out the last 10% of the budget when the final deliverable is completed to the satisfaction of CWCB staff. Once the final deliverable has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.
(b) Accountability: Per the 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 the 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 Update: July 31, 2018

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Supply Reserve Fund

EXHIBIT B - BUDGET AND SCHEDULE - Direct & Indirect (Administrative) Costs

Date: 10 Sep 2018

Water Activity Name: SLV Recharge Optimization Pilot Project

Grantee Name: Mosca-Hooper Conservation District

Task No.[1]	Description	Start Date[2]	End Date	Matching Funds (cash & in-kind)[3]	WSRF Funds (Basin & Statewide combined)[3]	Total
1	**Geologic Background**					
	Geologic reconnaissance of targeted					
	array sites	Feb 2019	Dec. 2019	$ 4,985	$0	$4,985
2a	**Geophysical Imaging**					
	Equipment rental, deployment, data					
	processing, report preparation	April 2019	Oct 2019	$ 22,700	$22,800	$45,500
2b	**Monitoring Wells**					
	Well permits & drilling	April 2019	Oct 2019	$ -	$9,800	$9,800
3a	**Figures, Maps, Outreach & Education**					
	GIS/educational items, website					
	maintenance, results outreach & education	April 2019	Nov. 2019	$ 1,930	$4,900	$6,830
3b	**MHCD Board Outreach**	April 2019	Nov. 2019	$ 4,000		$4,000
	Contractor management, reporting					
4	**District Manager**	Feb 2019	Dec. 2019	$ 650	$5,600	$6,250
			Total	$34,265	$43,100	$77,365

(1) The single task that include costs for Grant Administration must provide a labor breakdown (see Indirect Costs tab below) where the total WSRF Grant contribution towards that task does not exceed 15% of the total WSRF Grant amount.

(2) Start Date for funding under $100K - 45 Days from Board Approval; Start Date for funding over $100K - 90 Days from Board Approval.

(3) Round values up to the nearest hundred dollars.

• Additional documentation providing a Detailed/Itemized Budget may be required for contracting. Applicants are encouraged to coordinate with the CWCB Project Manager to determine specifics.

• Reimbursement eligibility commences upon the grantee's receipt of a Notice to Proceed (NTP)

• NTP will not be accepted as a start date. Project activities may commence as soon as the grantee enters contract and receives formal signed State Agreement.

The CWCB will pay the last 10% of the entire water activity budget when the Final Report is completed to the satisfaction of the CWCB staff project manager. Once the Final Report has been accepted, the final payment has been issued, the water activity and purchase order (PO) or contract will be closed without any futher payment. Any entity that fails to complete a satisfactory Final Report and submit to the CWCB with 90 days of the expiration of the PO or contract may be denied consideration for future funding of any type from the CWCB.

• Additonally, the applicant shall provide a progress report every 6 months, beginning from the date of contract execution

San Luis Valley - Aquifer Recharge Optimization - Detailed Budget for CWCB Funds Feb 19-2019

Mosca Hooper Conservation District

Dates	Exhibit A	Activity	Quantity Covered by Colorado Water Conservation Board (CWCB)	Quantity Covered by Colorado State Conservaation Board (CSCB)	Quantity Covered by MillerCoors (MC)	Quantity Coverd by Mosca-Hooper Conservation District (MHCD) In-Kind, hours	Cash Covered by CWCB Funding Sources	Cash Covered by CSCB	Cash Covered by MC	In-Kind Value Covered by MHCD In-Kind	Totals
Feb-Apr	Task 1	Geologist Team Days for Reconnaissance	0	10	0	0	$ -	$ 4,985	$ -	$ -	$ 4,985
Apr-Oct	Task 2	Geopysics Team Days & Equipment Rental	6.51	3.63	2.86	0.00	$ 22,800	$ 12,700	$ 10,000	$ -	$ 45,500
Apr-Oct	Task 2	Monitoring Wells Drilled	5	0	0	0	$ 9,800	$ -	$ -	$ -	$ 9,800
Apr-Nov	Task 3	Figures, Maps, Outreach & Education - Web Specialist Hours	54	21	0	0	$ 4,900	$ 1,930	$ -	$ -	$ 6,830
Apr-Nov	Task 3	MHCD Board Outreach Hours	0	0	0	60	$ -	$ -	$ -	$ 4,000	$ 4,000
Feb-Dec	Task 4	District Manager's Hours/Liability Ins.	320	0	0	0	$ 5,600	$ 650	$ -	$ -	$ 6,250
							$ 43,100	$ 20,265	$ 10,000	$ 4,000	$ 77,365