

**Improving Water Efficiency  
For Karval Water Users, Inc.  
by Updating Water Meters**

Submitted by:  
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## **Technical Proposal**

### *Executive Summary*

April 27, 2022

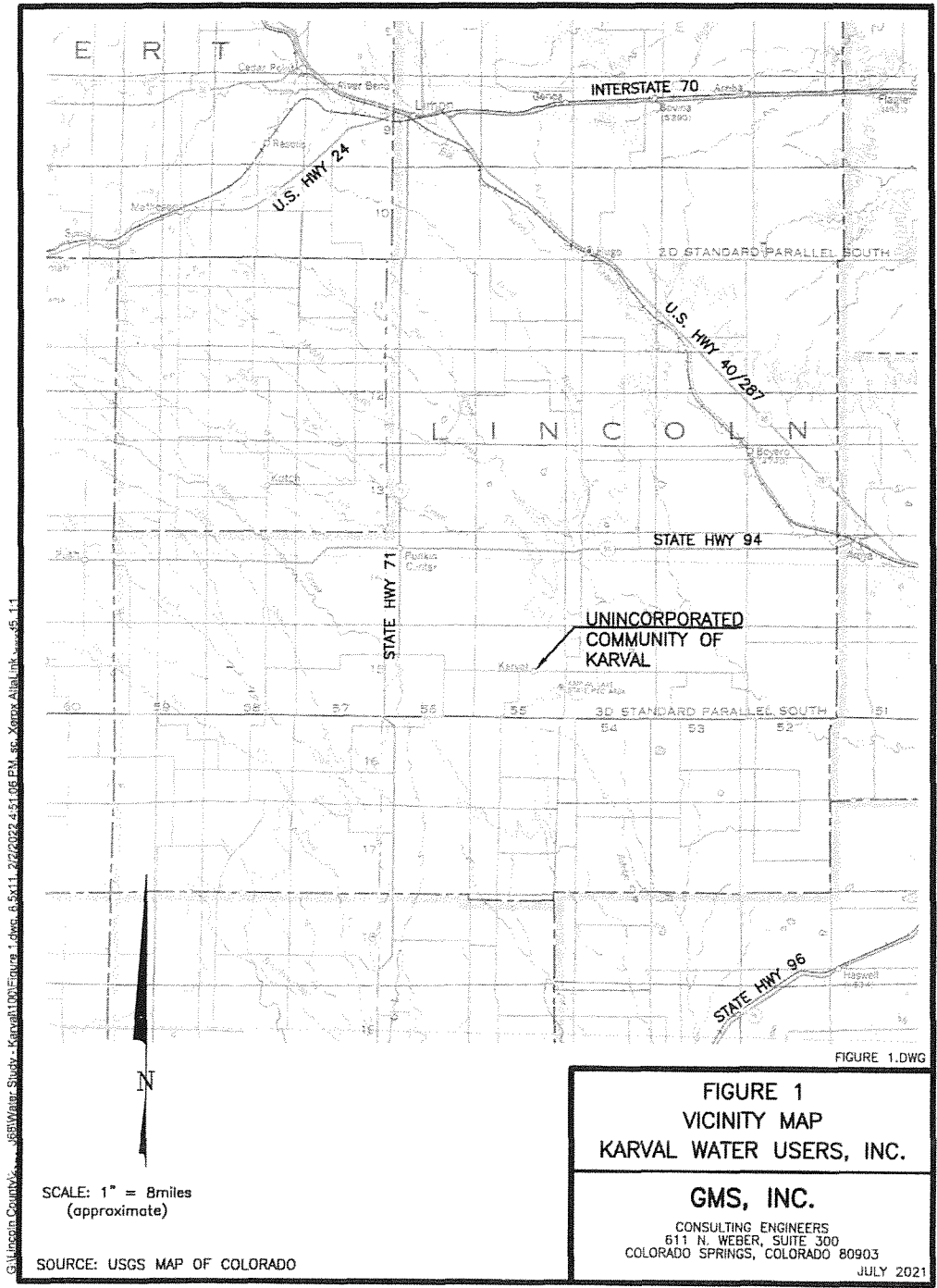
Lincoln County, Colorado

Category A Applicant

This project is located in Karval, Colorado and is an unincorporated community located in southeastern Colorado in Lincoln County. The community is located approximately 70 miles east of Colorado Springs, 8 miles south of Highway 94, and 9 miles east of Highway 71. This project materialized out of a larger water improvement project in Lincoln County. It strictly addresses modernizing customer water meters from manual-read meters to smart radio-read meters, and their accompanying materials to include management and billing software. Replacing the existing meters with radio-based devices will result in several benefits including improved accuracy of water usage reading, reduced man-hours, improved performance of meters, improved efficiency, reduced liability, and improved sustainability. These benefits will help to significantly reduce unaccounted-for-water loss in the system. This project will take approximately 30 days and will not begin until after October 1, 2023. This project is not located on a federal facility.

*Project Location*

Karval, Colorado is an unincorporated community located in southeastern Colorado in Lincoln County. The community is located approximately 70 miles east of Colorado Springs, 8 miles south of Highway 94, and 9 miles east of Highway 71. Karval Water Users, Inc. (KWU), an Enterprise of Lincoln County, operates a public drinking water system currently providing potable water to 35 active customers in the community. The approximate project coordinates are 38.7356° N, 103.5358°W.



### *Technical Project Description*

Karval Water Users, Inc. (KWU), incorporated in 1988, has provided treated water to the residents of Karval since its formation in 1965. In October 2020, Lincoln County created the Karval Water Users Water Activity Enterprise. This enterprise includes all assets, improvements, and systems of the KWU, and is owned solely by the County. This County Enterprise is governed by the Lincoln County Board of Commissioners. The Board of Commissioners contracts with the KWU Board of Directors to supply water for the Karval region.

The impetus for a Preliminary Engineering Report (PER), completed in March 2022, was concern with having only a single well that supplies the water system. If an unexpected event were to prevent water from being pumped from the single well, customers would be without drinking water. Drilling a second well for redundancy became of utmost importance. The PER presents the findings of a comprehensive evaluation of the water system including water supply and treatment, water quality, storage, distribution elements, and water metering. This proposal will strictly address customer water meters as identified in the PER.

Karval is an unincorporated community governed by Lincoln County. Its economic base is largely agriculture - grazing and dry-land farming - and the Karval School District. Its users receive water from KWU's single well located in the community. The water provider's service area consists primarily of residential housing with 35 active taps and three that are charged a vacation rate. The largest water user is the Karval School District.

KWU requires the installation of water meters for all customers. With the exception of the Karval Community Building, all customers are metered. Meters in use are Badger brand meters that are located in ground meter pits. Service lines in the water system are 3/4-inch PVC installed in 1965 or 2004. The water meters are manually read monthly. It is reported that all meters in the system are at least 17 years old and approximately 75% do not have backflow prevention in the meter yoke.

The American Water Works Association (AWWA) recommends an unaccounted-for-water goal of 10%, with proactive efforts taken to reach this goal. For KWU, the unaccounted-for-water loss for 2021 was averaged at 38.1%. This value is well above the AWWA targeted average. A substantial water main leak was repaired in February of 2021. Even so, the unaccounted-for-water percentage only dropped to below 30% for the last 10 months of 2021. With the water system improvements proposed in the PER, the unaccounted-for-water percentage is expected to conservatively drop to 20% of production.

One PER recommendation to improve KWU's unaccounted-for-water percentage is to install new radio-read meters at all customer locations and use a data management and billing system compatible with the smart devices. Specifically:

- 38 new meters including 5/8" x 3/4" meter, transmitter register and removal of existing meter.

- 28 new meters including a dual check meter setter, 5/8" x 3/4" meter, radio transmitter register, removal of existing meter and setter, and connection to existing service line.
- Radio-read data collector including software and training.

The sole obstacle to accomplishing this project is funding. The revenue source for the water system is generated from monthly user fees, tap fees, and water usage. Inactive customers are assessed a monthly vacation rate. As an Enterprise of Lincoln County, KWU will have the opportunity to apply for grant funding through a variety of sources. The match for this project will likely be the Drinking Water Revolving Fund. This metering project will be a separate subproject of the larger project.

KWU will be using GMS, Inc., Consulting Engineers to design, oversee and manage the overall project. This includes the administrative requirements for the funding being pursued for the project. GMS, Inc. has undertaken these types of projects since 1978 and has successfully performed these services on projects across the state. Given GMS, Inc.'s experience, expertise and professionalism, KWU is confident the project will be managed to the highest of standards. This project will not begin until after March 31, 2023 and the work will be completed by December 31, 2023. All funding, including this grant, will be acquired and contracts executed before this metering project will go to bid.

### *Evaluation Criteria*

#### Evaluation Criterion A—Project Benefits (35 points)

##### *Benefits to Applicant's Water Delivery System*

Replacing the existing meters with radio-based devices will result in a number of benefits:

- *Improved accuracy of water usage reading* – unintended error while recording water usage will be eliminated at the point of reading the meter and manually entering the data for billing purposes. New meters will transmit water usage of each customer over a defined period, ensuring precisely recorded consumption while identifying anomalies in the system and helping to prevent customer fraud.
- *Reduced man-hours* - the data collection from each customer will automatically occur daily rather than manually meter reading once a month at the customer's location. Additionally, the system will not require the manual entering of the data for billing purposes.
- *Improved performance of meters* – eliminating the need to open each pit to access the meters reduces potential for meter freezing in the winter months. Smart meters will alert KWU of when a meter stops counting or loses efficiency.
- *Improved efficiency* – meter data will be downloaded directly into the water billing software and billing will occur automatically, reducing time and improving accuracy. This also allows each customer to be billed on their consumption making an equitable billing system.

##### *Broader Benefits*

The primary broader benefit of replacing the deteriorating devices with radio-read meters is to *improve sustainability*. With smart meters, the water supplier will have the advantage of quickly

identifying anomalies in the system to repair leaks and breaks, prevent fraud and replace defective meters. This in turn will reduce water waste, improving sustainability.

Evaluation Criterion B—Planning Efforts Supporting the Project (30 points)

*Plan Development*

The impetus for a Preliminary Engineering Report (PER), completed in March 2022, was the concern grew that only a single well supplies the water system. If an unexpected event occurred taking the well out of commission, customers would be without drinking water. Drilling a second well for redundancy became of utmost importance. The PER was conducted by GMS, Inc. to evaluate the entire water system including water supply and treatment, water quality, storage, and distribution elements. KWU, with the full backing of Lincoln County, is seeking funds to make the improvements recommended in the PER. This project is identified in the PER.

*Support for the Project*

*Describe to what extent the proposed project is supported by the identified plan. Address the following:*

- *Is the project identified specifically in the planning effort?* Yes. The PER recommends all the manual-read water meters be upgraded to radio-read meters, meter yoke assemblies and software to manage the data and billing.
- *Explain whether the proposed project implements a goal or address a need or problem identified in the existing planning effort?* The PER evaluated the KWU water system and identified specific improvements to the water meters that will address current unaccounted-for-water losses. Installing smart meters, will allow the water system supplier to quickly identify where leakages and breaks are occurring and ensure reliable, accurate meter readings.
- *Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures.* Lincoln County/KWU, with the assistance of GMS, Inc., is working toward implementing all the recommendations in the PER. This water meter project is part of the overall improvement plan. All improvements are equally necessary for public safety, sustainability and stability of the community.

Evaluation Criterion C—Implementation and Results (20 points)

This project will be put out to bid since the Town does not have the capacity to perform the work on its own.

- Complete the PER.
- No design and engineering will be required for this project.
- Create the bid document.
- Advertise the bid document per Federal guidelines.
- No permits are required for this project.
- All other Federal guidelines for construction projects will be followed.

- It is estimated that this project will be completed within 30 days of contract execution with the contractor. It is anticipated that the work will begin after October 1, 2023 due to funding sources.

#### Evaluation Criterion D—Nexus to Reclamation (5 points)

This project does not demonstrate a nexus with a Reclamation project or activity.

#### Evaluation Criterion E—Presidential and Department of the Interior Priorities (10 points)

##### *Sub-criterion – Climate Change*

By replacing aged underreading water meters with smart meters, this project will help prevent, identify and repair unaccounted-for-water losses due to leaks and breakage in the distribution system. Therefore, this project strengthens water supply sustainability to increase resilience to climate change.

##### *Sub-criterion – Disadvantaged or Underserved Communities*

Lincoln County will likely receive *Disadvantaged Community* status through the Colorado Water Resource & Power Development Authority’s State Revolving Fund, as the County pursues this funding source. This status is based on several factors including the County’s Median Household Income (MHI) being equal to or less than 80% of State MHI; and Median Household Value (MHV) being less than 100% of State MHV. The MHI for Lincoln County is \$47,042, well below the State benchmark of less than 80% of \$60,185. The MHV is \$157,500, which is markedly below the 100% of State MHV (\$369,900).

The benefits of this program include *public safety* by ensuring there is adequate water supply; and *economic development* by ensuring a stable water supply and system for potential residential and commercial growth in the area.

### **Project Budget**

#### *Funding Plan and Letters of Funding Commitment*

The total project budget for automatic radio-read meters, meter yoke assemblies, and automatic meter reading software and training is \$166,320. KWU is requesting \$83,100 from the Reclamation Fund. The match of \$83,220 is currently being applied for through the Drinking Water Revolving Fund (DWRf) loan through the Colorado Department of Public Health and Environment, Water Quality Control Division, together with the Colorado Water Resources and Power Development Authority (CWR&PDA). Other funding sources will also be pursued and it is unclear what exact funding source will be the match for this project. If awarded this grant, the County will work closely with Reclamation to ensure that the match is acceptable to meet federal requirements.



Table 1. – Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
DWRP	\$83,220
Non-Federal Subtotal	\$83,220
REQUESTED RECLAMATION FUND	\$83,100

Table 2. – Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with requested Federal funding	\$83,100
Costs to be paid by the applicant	\$83,220
Value of third-party contributions	\$0
<b>TOTAL PROJECT COST</b>	<b>\$166,320</b>

Please note: this project will be put out for bid so the individual costs of materials, supplies, and labor are unknown. The budget below assumes all labor costs are included in the total cost.

Table 3. – Budget

BUDGET ITEM DESCRIPTION	\$/UNIT	QUANTITY	TOTAL COST
New meter including 5/8" x 3/4" meter, radio transmitter register and removal of existing meter	\$1,500	38	\$57,000
New meter including dual check meter setter, 5/8" x 3/4" meter, radio transmitter register, removal of existing meter and setter, and connection to existing service line.	\$2,200	28	\$61,600
Meter reading software & training	\$20,000	1	\$20,000
Subtotal			\$138,600
20% Contingency			\$27,720
<b>TOTAL ESTIMATED PROJECT COSTS</b>			<b>\$166,320</b>

*Budget Narrative*

This project will be put out to bid since the County via KWU does not have the capacity to perform the work on its own.

- A 20% contingency is included in the budget proposal due to the increasing costs of goods and services at this time.
- No design and engineering are required for this project.
- No permits are required for this project.
- Davis-Bacon wages will be paid and all other federal guidelines for construction projects will be followed.
- It is estimated that this project will be completed within 30 days of contract with the construction contractor. The work will begin after October 1, 2023.

Following are details pertinent to the bid and the actual work:

- Remove existing meter and pressure regulating valve, provide salvage to the Owner, furnish and install new meter assembly in same location complete, frost proof lid and cover with 1 3/4" predrilled hole, radio-read 5/8" x 3/4" meter with MIU, pressure regulating valve including unclassified excavation, Class "C" bedding, crushed rock, backfill, compaction, surface restoration and all incidental materials of construction, complete in place.
- Remove existing meter and pressure regulating valve, provide salvage to the Owner, furnish and install new meter assembly in same location complete with meter pit, frost proof lid and cover with 1 3/4" predrilled hole, radio-read 5/8" x 3/4" meter with MIU, spool piece to replace pressure regulating valve including unclassified excavation, Class "C" bedding, crushed rock, backfill, compaction, surface restoration and all incidental materials of construction, complete in place.
- Remove meter and setter, provide salvage to the Owner, furnish and install new assembly in different location complete with meter pit, frost proof lid and cover with 1 3/4" predrilled hole, radio-read meter with MIU, tandem meter setter with dual cartridge check valve, pressure regulating valve, Type "K" copper service lines extending 2' outside the meter pit including connections to existing service line with necessary compression couplings, unclassified excavation, Class "C" bedding, crushed rock, backfill, compaction, surface restoration, filling existing meter pit with sand and all incidental materials of construction, complete in place.
- Remove existing meter and pressure regulating valve, provide salvage to the Owner, furnish and install new meter and spool piece in existing meter pit complete with cover with 1 3/4" predrilled hole, radio-read 5/8" x 3/4" meter with MIU, spool piece to replace pressure regulating valve including unclassified excavation, Class "C" bedding, crushed rock, backfill, compaction, surface restoration and all incidental materials of construction, complete in place.
- Furnish and install 4-inch dual check valve assemblies in existing meter vault complete with dual check valve, required flange x plain end spool pieces of appropriate size ductile iron piping, couplings, reinstall flow meter and all incidental materials of construction, complete in place.

### **Environmental and Cultural Resources Compliance**

The project of new meter installation and new meter pit construction will be fully within existing disturbed areas, which would most likely classify the project as a Categorical Exclusion (CE) to NEPA. There will be no new ground disturbance related to this project specifically.

The larger project will require an Environmental Assessment (EA) due to the larger construction area containing undisturbed soils specifically to drill a new well. Depending on the funds awarded to the County, the EA will be facilitated either through the Colorado Department of Public Health and Environment (CDPHE) or through the Department of Local Affairs (DOLA). If awarded this grant for this sub project, the County recognizes that Reclamation will complete its own environmental review process and determine the required compliance with NEPA.

It is also recognized that Reclamation will also consider if the project will cause effects to historic properties. As with the NEPA review, depending on the funding sources secured for the larger project, a Section 106 may be conducted by the State Historic Preservation Officer (SHPO). The County will coordinate with Reclamation regarding the review as a Section 106 review may be with a conclusion that “no historic properties affected [36 CF 800.4(d)(1)] under Section 106 for the above undertaking.” As with the NEPA review, the County recognizes that Reclamation will complete its own review and determine if Section 106 clearance will be required.

### **Required Permits or Approvals**

No permits or approvals are required for this project.

### **Letters of Support**

Please see attached.

### **Official Resolutions**

The official resolution will be submitted under separate cover within 30 days.

### **Conflict of Interest Disclosure**

Per the Financial Assistance Interior Regulation (FAIR), 2 CFR §1402.112, the County does not have any known conflicts of interest. If during the award process a conflict arises, the County will inform Reclamation.

### **Uniform Audit Reporting Statement**

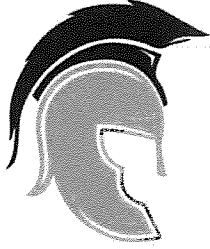
The County recognizes that any organizations expending \$750,000 in U.S. Federal award funds within one year will require a Single Audit report. After the project is complete, the County will determine if a Single Project Audit is required and will complete if necessary.

### **Certification Regarding Lobbying**

This request for funding is less than \$100,000 in Federal funding. No Certification Regarding Lobbying is required.

### **Unique Entity Identifier**

Lincoln County UEI: VMAHXKTNZYB6



16232 County Road 29  
PO Box 5  
Karval, CO 80823

## Karval School District RE-23

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U.S. Bureau of Reclamation  
Water Resources and Planning Office  
Mail Code: 86-6300  
PO Box 25007  
Denver, CO 80225

April 27, 2022

Dear Ms. Robin Graber:

This letter of support is from the Karval School District RE-23 for the WaterSMART Small-Scale Water Efficiency Project Grant. The town of Karval has made an effort to make improvements to its water system and the school district is an interested stakeholder in this project. Karval is making every effort to improve its water system; however, due to the limited resources available, the town needs assistance to make important upgrades. Of these important upgrades, the replacement of the water meters with radio read meters have several efficiency benefits. First, the replacement of meters will ensure accuracy of the meters for Karval, enhancing the ability to assess if there is water loss. Second, Karval currently reads water meters manually, which is time-consuming and is subject to human error. Another benefit of converting to radio read meters with software is that the cost to read meters and bill users will go down significantly which will have an immediate impact on a small community like Karval. The upgrade of Karval's water meters will make the water system more efficient.

I thank you for considering this project for funding through the WaterSMART Small-Scale Water Efficiency Project Grant. I believe that Karval Water Users, Inc. will utilize the funds well and that the project will benefit the residents and patrons on the system by lowering operating costs and enable the community as a whole to be waterwise.

Sincerely,

Sarah Nuss, superintendent