

**Joshua Valley Utility Company  
Phase III: Upgrade 400 Manual Read  
Meters to Advanced Meter Reading  
(AMR) Technology**

**Prepared For:**  
U.S. Department of the Interior - Bureau of Reclamation  
WaterSMART Small-Scale Water Efficiency Projects for Fiscal  
Year 2024 and Fiscal Year 2025  
Funding Opportunity Number: R24AS00059  
Application Period 2  
Category A

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# 1 Technical Proposal

## 1.1 Executive Summary

**Date:** July 9, 2024

**Applicant:** Joshua Valley Utility Company

**City, County, State:** Meadview, Mohave County, Arizona

**Project:** Phase III: Upgrade 400 Manual Read Meters to Advanced Meter Reading (AMR) Technology

**Category Applicant:** A

**Grant Funding Request:** \$100,000

**Non-Federal Matching Funds:** \$100,432

**Total Project Costs:** \$200,432

**Est. Completion Date:** December 31, 2026

**Est. Duration from contract award date:** Approximately 12 months

**Federal Facility Denotation:** The Project is not located on a federal facility

**Project Partner:** None

Joshua Valley Utility Company (JVUC) is committed to aggressively pursuing water-use efficiency by embracing proven methods and technologies to achieve that goal. JVUC proposes implementing Phase III – Upgrade 400 Manual Read Meters to Advanced Meter Reading (AMR) Technology to reduce non-revenue water through more accurate water use measurement and accounting, improved leak detection and reduction, and increased water conservation. In Phase III, JVUC will replace 400 outdated, under-registering, manual read meters with new Master Meter AMR meters.

Ninety percent of the JVUC 1,010, 5/8" x 3/4" customer water meters are substantially over ten years old. In Decision No. 78613, dated July 11, 2022, Arizona Corporation Commission (ACC) staff stated that JVUC has been experiencing an average water loss of 17.2 percent over the past five years, which exceeds the ACC staff recommended water loss level of no greater than 10.0 percent. The ACC staff believes that much of the water loss relates to the age of the customer meters. With the replacement of the outdated, under-registering meters, JVUC will see the accuracy of water accounting increase significantly both for an increase in billed water and, very likely, a decrease in reported lost and unaccounted water. The goal is to leverage science and technology to increase the efficiency of the meter reading process, accurately account for metered water use, and reduce lost and unaccounted water, thereby improving water supply reliability and using our water resources more efficiently. The new meters will also help customers monitor their water usage better and allow JVUC to notify them if they significantly increase their water usage.

## 1.2 Background

Phase III will substantially advance the implementation of AMR at JVUC by replacing 400 manual-read water meters with new Master Meter AMR-compatible meters and replacing the old meter with a new radio-read AMR meter.

The Arizona Corporation Commission (ACC) regulates public service corporations operating in Arizona. A private water company is one form of ACC-regulated public service corporation. JVUC, a Community Water of America Inc. (CWA) subsidiary, is a private water company regulated by the ACC as a Class D water utility that provides potable water service to approximately 1,047 customer connections in Mohave County, Arizona. JVUC can only provide water service to customers located within an area included in or contiguous to an area defined as a Certificate of Convenience and Necessity (CC&N) and may only charge water rates approved by the ACC. A CC&N is an area with a well-defined legal description that could be compared to a city limit. The ACC reviews any requests for establishing or expanding a company's CC&N, with the determining factor being the public interest. The ACC evaluates the company's capabilities and qualifications for providing water service to the requested service area before granting or denying the company's request to establish or expand its CC&N. JVUC's original CC&N was given by the ACC in 1966 in Decision No. 38720 and 1972 in Decision 41917. The ACC's scope of regulation of water companies does not end with rates or CC&Ns but also includes financing, reporting, and the terms and conditions for water service provision.

JVUC's water system consists of five active wells, four storage tanks, one pressure tank, and a distribution system. The wells were drilled between 1966 and 2012, range in depth from 600 to 800 feet deep, and have a combined pumping capacity of 248 GPM. The storage tanks were installed in 1976 and 1978 and have a combined storage capacity of 510,000 gallons. The pressure tank has a capacity of 5,000 gallons and was installed in 1978. The JVUC water system is around 50 years old and consists of approximately 60 miles of water main ranging in size from 3 to 8 inches. Service valves are located throughout the system.

In 2022, JVUC had an average of 1,032 active metered customers, which consisted of 999 single-family accounts, one multi-family account, 28 commercial accounts, and four other non-residential accounts. JVUC pumped 38.9 million gallons of groundwater and delivered 34.2 million to metered customers. Water loss (the difference between water pumped and recorded water sales) has averaged approximately 15.56% over the past six years (Table 1).

**Table 1: Annual Water usage, Water Sold, and Water Losses for 2018 through 2023**

Active Meters		Water Pumped	Water Sold	Water Loss	Water Loss
Year	(Total EOY)	(Gallons/Yr.)	(Gallons/Yr.)	(Gallons/Yr.)	(Annual %)
<b>2018</b>	959	40,405,517	33,562,641	6,842,870	16.94%
<b>2019</b>	977	40,347,500	32,056,516	8,290,984	20.55%
<b>2020</b>	993	43,461,424	36,549,300	6,912,124	15.90%
<b>2021</b>	1,018	38,024,619	35,441,636	2,582,983	6.79%
<b>2022</b>	1,047	38,974,970	34,263,630	4,711,340	12.09%
<b>2023</b>	1,041	39,184,300	31,636,158	7,548,142	19.26%
<b>6-Yr Avg</b>		40,066,388	33,918,314	6,148,075	15.34%

Due to funding constraints and other current needs, JVUC has been unable to focus its limited resources on replacing outdated meters, which are likely not accurately measuring water sold to customers. Outdated meters are known to read slowly and can substantially under record customer use. Without an accurate accounting for customer water usage system-wide, JVUC cannot determine the water loss in the water system. Table 2 summarizes the size, quantity, throughput, and age of all customer water meters in the system in 2022.

**Table 2: Customer Water Meters in 2022**

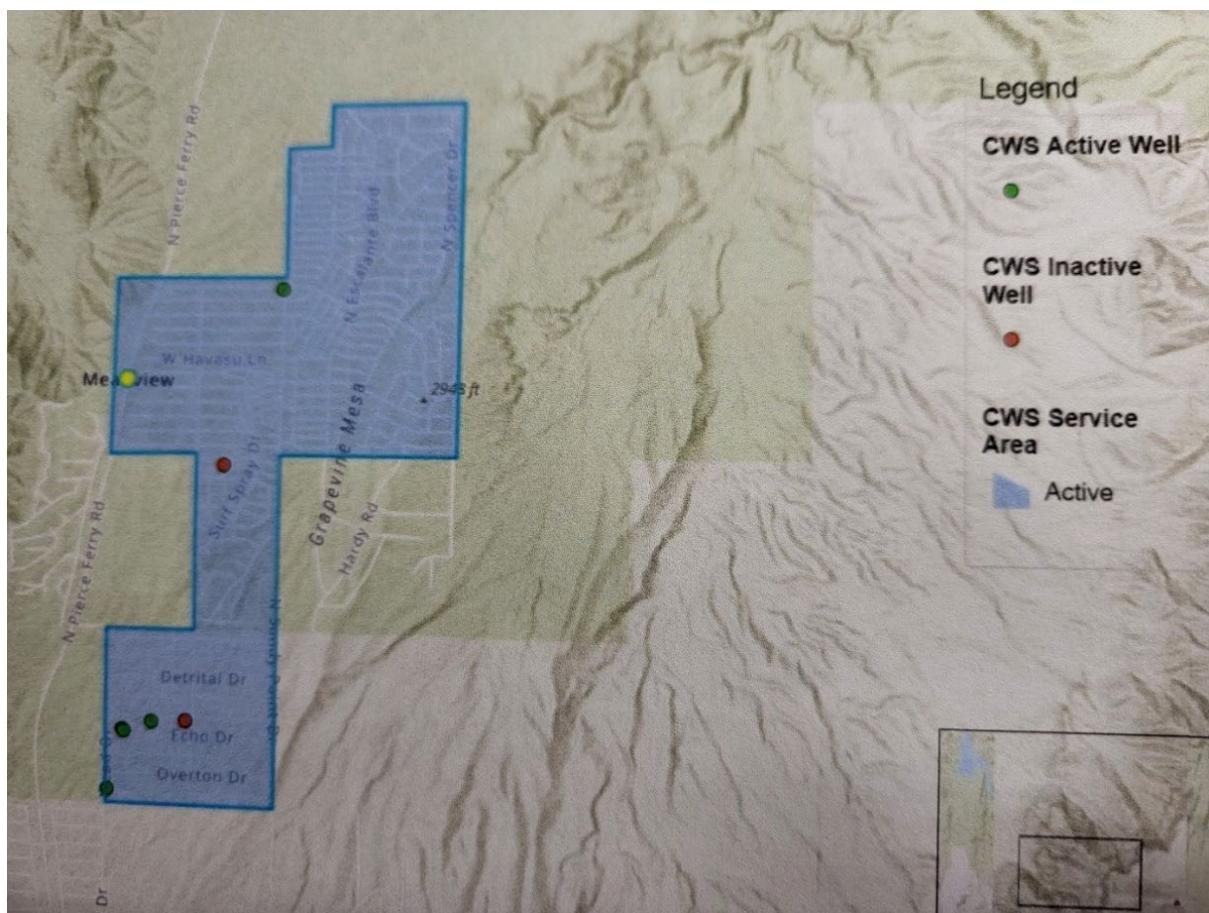
Size (inches)	Quantity	Percent over 1,000,000 gallons	Percent over Ten years old
<b>5/8 x 3/4</b>	1,010	25%	90%
<b>0.75</b>	7	10%	100%
<b>1</b>	20	25%	40%
<b>1.5</b>	1	100%	100%
<b>2</b>	9	100%	10%
<b>Total</b>	1,047		

Ninety percent of the JVUC 1,010, 5/8" x 3/4" customer water meters are over ten years old. JVUC has not undergone a system-wide meter replacement program other than for individual meters, which have been known to be inoperable since the company's inception in 1966. In ACC Decision No. 78613, dated July 11, 2022, Arizona Corporation Commission (ACC) staff stated that JVUC is experiencing an average water loss of 17.2 percent over the past five years, which exceeds the ACC staff recommended water loss level of no greater than 10 percent. ACC staff stated that they believe that much of the water loss relates to the age of the customer meters and noted that this issue should be further addressed in JVUC's next rate case.

## 1.3 Project Location

JVUC CC&N, as shown in Figure 1, serves Meadview, Arizona, an unincorporated community and a census-designated place (CDP) in northern Mohave County, located near Lake Mead. It is at an elevation of 3,500 feet. It is 67 miles north of Kingman, the county seat. According to the United States Census Bureau, the Meadview CDP has an area of 31.0 square miles. As of the 2020 census, Meadview had 1,420 residents, up from 1,224 as of 2010. It was founded in the 1960s.

**Figure 1: Joshua Valley Utility Company CC&N Boundaries**



## 1.4 Technical Project Description

To accurately capture all water usage in the distribution system, meters are the primary tool for measuring water delivery to each property with water service. To accurately measure water usage for a property, meters should be replaced due to the amount of water flowing through the meters and age. Meters in the JVUC service area are mostly 5/8" x 3/4" and substantially over ten years old.

As part of JVUC's monthly meter reading and billing routine, each meter must be manually read, and the reads are then manually entered into our billing system. This is an incredibly time-intensive process and can result in human errors. With the new technology being used since the 1990s, there is a proven track record that radio read and fixed base systems are more accurate and a time-saving tool, reducing costs. AMR frees up limited operators' resources to work on the systems' regular repairs and maintenance needs. With increased accuracy and efficient reading and recording technology, the system will see decreased water loss as water usage can be better measured. Further, with accurate water loss data, operators can develop a program to locate and address system leakage.

As part of the water system improvements and joining the 20th century with technology, moving JVUC to an automated meter reading and billing system is the next step. With radio read or fixed base meter reading systems being used nationwide, there is a track record for reducing manual labor in physically reading each meter and sending the reads to a billing office. With radio read and fixed base systems, the reading is automated, and system software can enter the data into the billing system. The change requires replacing existing meters with meters incorporating radio technology, a software purchase, an annual license, and configuration for communicating information between the meter reading and billing systems.

The reason for the water meter replacement program is three-fold: First, American Water Works Association (AWWA) best practices require meters to be changed out every ten to twelve years or at a threshold of one to two million gallons of use. Second, ACC staff recommend that water loss not exceed 10 percent. Third, the Arizona Department of Water Resources (ADWR) requires water systems to report the amount of water lost or unaccounted for. Replacing the meters regularly meets goals for JVUC, the ACC, and AWWA and is fundamental to achieving improved efficiency and better overall water management and conservation goals. Replacing outdated meters, which are likely under-reporting customer usage, JVUC will be able to measure water loss more accurately to determine how much water is lost due to potential system leakage. With more accurate and timelier meter read data and assessment of water loss due to system leakage, JVUC can develop a program to make further distribution system improvements to reduce water loss and groundwater production and improve the sustainability and drought resiliency of JVUC's water supply.

The scope of Phase III is to replace 400, 5/8" x 3/4" manual read meters in the water system with new Master Meter Bottom Load Multi-Jet (BLMJ) residential cold-water meters equipped with Master Meter's 3G Mobile AMR registers for reading through radio read, thereby reducing manual labor, increasing efficiencies, leak detection, and providing accurate water loss data which is needed to develop a water loss reduction program. This will be done by removing the old meter and replacing it with a new radio-read AMR meter. Table 3 shows the total cost of Phase III, estimated at \$200,432, based on a preliminary quote from a third party (**Attachment C**).

**Table 3: Phase III AMR Technology Upgrade Cost Estimates**

5/8" x 3/4" Meters and Registers (400).....	\$156,432
Meter Installation (Contract Services).....	<u>\$ 44,000</u>
<b>Total Cost.....</b>	<b>\$200,432</b>

## 1.5 Evaluation Criteria

### 1.5.1 Evaluation Criterion A – Project Benefits

The January 2022 report titled “Increasing consumer benefits & engagement in AMI-based conservation programs,” prepared for the American Water Works Association by The Behavioralist, found that credible water savings associated with AMI-based metering technology can be as much as 10%.

A six-year average of JVUC’s annual groundwater pumping from 2018 through 2023 is 40,066,388 gallons or 122.96 acre-feet. Average Annual Lost & Unaccounted for Water (L&U) for that same period is 15.34%, 6,148,075 gallons or 17.42 acre-feet. Based on this projection, 10% of annual groundwater pumping is 4,006,639 gallons or 11.36 acre-feet if all 1,047 meters were replaced. The conversion of 400 manual read meters to AMR in **Phase III is estimated to produce a potential water savings of 4,006,639 gallons times 38.2% (400/1047) of meters replaced for an adjusted annual water savings of 1,530,712 gallons or 4.70 acre-feet**, based on improved leak/break detection paired with enhanced customer notifications and quick repairs. More detailed information regarding the rationale behind water savings estimates is included below.

*Describe current losses: Please explain where the water that will be conserved is currently going and how it is being used.*

The AMR meters for this project use advanced technology and will better manage the JVUC groundwater supply and provide more accurate readings for proper accountability of customer water usage. The average age of meters in JVUC’s system is approximately 25 years old, with our oldest meters in place since the water system’s inception around 1970. It is anticipated that by replacing JVUC’s outdated and under-registering water meters, JVUC will likely reduce

reported water loss by simply recording and billing more accurately for customers' water usage. With accurate water loss information, JVUC will be able to develop a water loss reduction program to locate and address system leakage and reduce unnecessary water pumping, lowering power cost, system wear and tear, and, importantly, reducing stress on the groundwater basin, improving drought resiliency in the region. Finally, AMR meters incorporate alarms that notify the company of leaks on the customer side of the meter and data logging that records up to six months of customer usage, which can be used to help identify and address unusually high customer usage and potential leaks. A tool that will allow us to match better pumping to usage and reduce groundwater pumping for our customers and other groundwater users in the basin.

The service area of the Joshua Valley Utility Company has been described by the Arizona Department of Water Resources (ADWR) as being located within the Meadview Basin, which is a part of the Basin and Range physiographic province, which consists of northwest-trending alluvial basins separated by elongated fault-block mountain ranges (ADWR, 1994). The Meadview Basin is oriented north-south and is approximately 16 miles long by six to seven miles wide. It encompasses approximately 190 square miles and is bounded on the east by the Grand Wash Cliffs, on the west by Wheeler Ridge, on the south by the Garnet Mountains, and on the north by Lake Mead.

Groundwater movement in the Meadview Basin is northward from the southern highlands towards Lake Mead. The depth to groundwater varies from 935 feet below land surface (bls) in the southern portion of the basin to 135 feet bls in the northern basin near Grapevine Wash (ADWR, 1981, Hydrologic Map Series Report 4). A 1985 Water Adequacy Study by the consulting firm Cella Barr Associates reported that groundwater levels near Meadview are declining about one foot per year due to increased pumping to meet water demands. ADWR estimates groundwater pumping to be approximately 100 acre-feet per year, of which Joshua Valley Utility Company supplied 71 acre-feet of water to customers in the Meadview area. No estimates of the annual average water recharge into the basin are available, though the recharge rate is likely minor due to high evapotranspiration and low precipitation amounts.

Published hydrogeologic reports or maps were not available for the area. Still, JVUC's hydrogeologic consultant was able to access files from the ADWR Groundwater System Inventory (GWSI) database that are indicative of the physical conditions (water table depth) of the local aquifer system. The ADWR monitor well (55-610730) provided a detailed history of the depths-to-water in that well, indicative of other wells in the local area. Recorded water levels include yearly data from 1982 to 1990 and biannual data from 1990 to 2022. Static water levels in the wells with historical records have dropped from approximately one to two feet yearly since about 1983. This drop in the water table may reflect the combination of influence from the declining levels in Lake Mead, population growth in the area, or other factors such as drought and climate change.

With a water loss reduction program, JVUC can reduce unaccounted-for water, thereby reducing groundwater pumping and pressure on the Meadview Basin, which local communities

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rely on. This will positively impact water management in the area and sustain water supplies to other potentially affected interests reliant on the Meadview Basin. By better managing the groundwater basin through accounting accuracy, reduced pumping will also reduce the amount of electricity and extend well and pump life. Additionally, water customers will be billed accurately for their water usage, encouraging conservation and contributing to the JVUC system's financial stability. The project will benefit current and future water customers in the JVUC CC&N and neighboring communities in our geographic area that rely on water drawn from the Meadview Basin.

In Phase III, water savings will be achieved by replacing 400 outdated, under-registering, manual-read meters with new Master Meter BLMJ residential cold-water meters (Attachment D) equipped with Master Meter's 3G Mobile AMR registers (Attachment E) to provide fixed network-like performance minus the infrastructure or cost.

JVUC will benefit from the Master Meter 3G Mobile Drive-By AMR platform by (**Attachment F**):

- Gaining protection against theft, leaks, and tampering.
- System-wide meter data for precision, accurate water accountability, and analytics.
- Detailed snapshot of consumption behavior and verification of leaks and flow anomalies. Empowering conservation and accountability.
- Minute-by-minute flow analysis. Optimize revenue, reduce wear, and record every drop.
- Macro leak containment through zonal balancing and district meter areas and zones.
- Data is pushed back to headquarters in real-time for timely usage and analysis.
- Advanced in-field data collection and diagnostics.

A review of AMR case studies focused on those that addressed leak detection and reduced L&U water. Case studies link the use of AMR, its availability to detect water leaks, the collection of water consumption data, and the behavioral impacts derived from comparative water consumption analytics to quantifiable water savings.

Results from the City of Smyrna, Georgia, "The City of Smyrna, GA Boosts Revenue By \$2.6M Over 9 Years Using Master Meter's Multi-Jet Technology," as presented in Attachment G, were used to help support Phase III's water savings analysis. The city has 14,500 metered connections. Meters were read manually. The inaccurate aging meters resulted in measured water loss from unregistered water use. The City's goal was to reduce lost revenue caused by inaccurate meters and minimize water loss through leak detection and engagement with the customer. The city purchased Master Meter's BLMJ meters with 3G AMR Drive-By Radios to replace the existing water meters. Combining new, more accurate meters and electronic reads that eliminate human error resulted in increased revenue. And the new 3G registers added functionality, including alerts for possible theft or tampering. Over nine years, the city reported a \$2,606,035 increase in billable water usage or an increase of \$289,559 per year. AMR helped the city identify system and customer water leaks and reduce water loss. Another outcome of

implementing AMR was that the city could reduce the number of meter readers, vehicles, and associated costs by 50 percent.

Actual water savings will be verified by comparing historical water consumption data from the JVUC's existing accounts to water usage after the Phase III implementation of AMR. Post-project consumption data should include an entire one-year period after project completion to allow a meaningful comparison against the pre-project consumption data set, ensuring the most accurate and reliable results.

Energy savings estimates associated with reduced water use originate from a projected reduction in groundwater pumping. **Phase III will result in quantifiable annual energy savings of 4,980.6 kWh.**

Annual energy use for pumping groundwater in 2022 was collected from JVUC's utility bills. JVUC used 117,055 kWh to pump 110.46 acre-feet of groundwater 2022, or 1,059.7 kWh/AF. **(Attachment B, Page 11.)** Avoided energy demand resulting from projected annual water savings was determined, as shown in Table 4 below.

<b>Table 4: Phase III Avoided Energy Demand Resulting From Water Saving Estimates</b>	
Projected Annual Groundwater savings	4.70 AF
Power for Pumping in 2022	1,059.7 kWh/AF
<b>TOTAL Energy Savings</b>	<b>4,980.6 kWh</b>

JVUC spends approximately 30 hours each month driving through the system to manually read each meter, including rereading misread meters and verifying high meter reads. When accounting for training, holidays, vacation, and sick time, the time to manually read meters is more than a full-time equivalent (FTE) work week per month or approximately equivalent to three months of an FTE. With the drive-by radio read AMR meters, JVUC will reduce driving time by 25 hours a month and 300 hours a year, thus reducing carbon emissions and providing labor savings. By accurately calculating water at customer meters, JVUC will be more precise in collecting water loss data, pinpointing other areas where water loss occurs, and working towards making the necessary repairs and improvements within the distribution system to lower water loss. This technology will also allow JVUC customers to analyze their water usage to address customer-related leakage and conserve water.

The EPA's GHG Equivalencies Calculator was utilized to calculate the amount of carbon dioxide emitted per gallon of motor gasoline burned, and information can be found here: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Reducing water use reduces the energy demand to pump and convey groundwater (embedded energy). The EPA's GHG Equivalencies Calculator calculated the carbon dioxide emitted per

kilowatt hour associated with embedded energy in pumped water. **Based on the calculator, the reduction in vehicle miles and water consumed is expected to translate to avoiding GHG emissions of 3.6 MT CO<sub>2</sub>e.** See Table 5.

Table 5: EPA GHG Equivalencies Calculator		
GHG Emissions Avoided		
Source	Savings	MT CO <sub>2</sub> e Calculator Value
Embedded energy in water	4,980.6 kWh year	3.5
Reduced gallons of fuel	13 gallons per year	0.1
<b>TOTAL MT CO<sub>2</sub>e:</b>		<b>3.6</b>

*Will the proposed project increase collaboration and information sharing among regional water managers? Please explain.*

If successful, the JVUC plans to share this information with any other small water systems statewide that are struggling with high non-revenue or lost and unaccounted water numbers and meter reading inefficiencies and wish to equip themselves with the information needed to apply for federal grant opportunities. We will also share this information with the community and neighboring small water providers in Mohave County.

*Any anticipated positive impacts/benefits to local sectors and economies (e.g., agriculture, environment, recreation, tourism)*

In 2021, the median age of residents in Meadview is 68.4, and the median household income is \$50,986. Residents are primarily fixed income, and the 2021 poverty rate is 21.1%. JVUC is a private water company funded by user water rates; the reliability and financial viability of the system are crucial to sustaining and growing the area. Rate increases significantly burden many customers in JVUC's economically depressed area. Realizing savings in operational efficiencies and water production from meter conversion to radio read technology will benefit JVUC's customers by allowing savings to be redirected to other investments in JVUC's infrastructure to improve system performance and reliability further.

As noted in the Bureau of Reclamation's [Overview of Disadvantaged Communities and Native American Tribes in the Santa Ana River Watershed](#), residents in severely disadvantaged or underserved communities are often disproportionately impacted by high infrastructure costs, poor water quality, and failing septic systems. JVUC wants to ensure that all community members, especially those with fewer resources, have access to technologies that save money and preserve precious water resources.

*The extent to which the project will complement work in coordination with NRCS in the area (e.g., with a direct connection to the district's water supply).*

It is estimated that by replacing outdated water meters, JVUC will likely reduce lost, unaccounted, or non-revenue water through improved efficiency and better water management.

*Describe any on-farm efficiency work currently being completed or anticipated to be completed using NRCS assistance through EQIP or other programs.*

No on-farm efficiency work is being completed using NRCS assistance.

### **1.5.2 Evaluation Criterion B—Planning Efforts Supporting the Project**

JVUC approved its current fiscal year 2024 budget with \$14,000 allotted to system repairs and maintenance and an additional \$200,000 for improvement projects. Most of the funds for improvement projects will be directed to upgrades to wells, water storage facilities, and the distribution system to improve and maintain system reliability. Even with limited funds in a small system, the importance of this project has been identified by the company management and the ACC as a priority. Without the grant, the meter replacement project will need to be funded over up to five years. The receipt of this grant will allow Phase III to begin in 2024 and become operational within twelve months; thus, the benefits to the system, the users, and the aquifer will be realized earlier. The JVUC is committed to meeting the objective of this Reclamation funding opportunity by leveraging funds and resources to complete the work and evaluate the results. This project will allow us to better engage our customers in actively managing their use and quickly identify and address leaks.

Additionally, the Bureau of Reclamation's Colorado River Basin Water Supply and Demand Study reported that a best management practice for municipal and industrial water conservation is "meter retrofits." The Phase III AMR project is a meter retrofit program. Information on the study can be found here:

<https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/studyrpt.html>

### **1.5.3 Evaluation Criterion C—Implementation and Results**

JVUC is the singular entity implementing Phase III, located entirely within JVUC's CC&N and ready to proceed according to the schedule provided in this proposal. As well as being a recognized priority of the ACC and company management, the company has approved system repairs, maintenance, and equipment improvement for 2024. Funding is planned, with a portion of the budget designated for the meter replacement project. JVUC adopted Resolution 2024-06-28 authorizing the application to the U.S. Department of the Interior's WaterSMART Program for a grant to fund the replacement of existing individual user water meters with AMR (**Attachment A**). Again, without grant funding, this project would have an implementation timeline of up to five years. Receipt of grant funding would move the entire

meter replacement project up for completion in 2025. JVUC does not anticipate that permits will be required as all meters will be installed in place of existing system water meters. The JVUC management and operations or contract staff will manage and execute all project-related approvals promptly and efficiently. The capability to purchase meters and equipment is established through the JVUC's company policies for procurement and contracts necessary to provide the project's equipment, software, hardware, programming, and installation services. Procurement activity and site work will proceed according to the schedule below. No engineering work is necessary. There are no environmental compliance costs associated with this project.

#### **PROJECT SCHEDULE / MILESTONES (Milestones are based on days after the Grant Award)**

##### Meters Installed by Contractor

1. Procure Radio Read AMR meters & meter installation contracts:	90 Days
2. Meter Installation by Contractor:	180 Days
3. Completion of Phase III:	90 Days

#### **1.5.4 Evaluation Criterion D—Nexus to Reclamation**

Reclamation and the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) have collaborated to align program resources in areas of the Western United States where their mission areas overlap (17 Western States), to improve the impact of the agencies' respective drought resiliency and water efficiency investments. This project aligns with those goals and will enhance drought resiliency and water efficiency in an aquifer that intensely supports commercial and residential activities.

JVUC's meter replacement project supports the Department and Reclamation priorities detailed below and elsewhere in this application. This project is an innovative application of existing science/technology. With the installation of this technology, JVUC will be able to account for metered water use accurately. This technology enables JVUC to manage its water by aligning production with accurate metered use and directing loss and unaccounted-for water efforts to other areas of infrastructure and system management, such as leaks, flushing, etc. JVUC sees this technology as a best management practice over the region's water resources.

JVUC knows that regional collaboration is essential in times of drought. JVUC shares the aquifer with private well owners and commercial users. By converting outdated meters to AMR, JVUC is demonstrating to any potentially affected interests that JVUC is collecting and reporting accurate data to best manage the shared basin. JVUC reports its annual water use through ADWR and the ACC, and most prominent water providers look at what their neighbors report to the State. It is essential that JVUC's neighbors, State and Local government, and

customers feel confident that the company is a good steward of its natural resources by accurately reporting water use, billing data, and water loss.

As a small public water system operating in an economically depressed area, JVUC faces significant challenges in making timely infrastructure improvements and adopting advanced water management technologies. However, with the support of collaboration and funding from public sources, we can overcome these challenges. Considering the ongoing drought conditions and funding restrictions, we are actively seeking grant opportunities to achieve our water efficiency goals in a fiscally responsible and timely manner.

### **1.5.5 Evaluation Criterion E—Presidential and D.O.I. Priorities**

Surface water and groundwater throughout the region face constant tension as demands for water from increasingly strained sources continue to grow. The Arizona Department of Water Resources (ADWR) Interactive Drought Dashboard ([Drought Data Dashboard | Arizona Department of Water Resources \(azwater.gov\)](https://azwater.gov/drought-data-dashboard)) reports that on average, from the year 2000 to present, 21.8% of Mohave County has been Abnormally Dry, 23.23% has been in Moderate Drought, 16.86% has been in Severe Drought, 11.42% has been in Extreme Drought, and 3.33% has been in Exceptional Drought. With Mohave County under drought conditions, reduced stream flows in the Colorado River, reduced natural recharge of the groundwater basin, and declining groundwater levels, many have developed an awareness that water is a valuable and potentially scarce resource.

JVUC relies entirely on pumped groundwater from the Meadview Basin to meet its potable water demand. Static water levels in the wells with historical records have dropped from approximately one to two feet yearly since about 1983. This drop in the water table may reflect the combination of influence from the declining levels in Lake Mead, population growth in the area, or other factors such as drought and climate change. As the aquifer is drawn down, wells will be deepened, the cost to pump groundwater will increase, water quality will degrade, land subsidence issues may surface, and the area will not have enough supply to meet demand. Ultimately, Phase III will help increase the water available to JVUC and other groundwater users in the Meadview Basin. Reducing groundwater pumping and lowering the basin's groundwater table decline rate will help improve sustainability and drought resiliency.

As stated before, embedded energy avoidance because of decreased demand for water will promote greater resource sustainability. Reduced energy use will reduce strain on the power grid. AMR technology will significantly reduce the time and cost of collecting monthly meter readings, reducing fossil fuel consumption and contributing to sustainability. Enhanced access to water consumption data and leak detection will promote better water management, promote water-efficient behaviors, and enable faster repair of leaks and breaks.

*Please use the White House Council on Environmental Quality's Climate and Economic Justice Screening Tool to identify any disadvantaged communities that will benefit from your project. Please include a map of the service area indicating which sections are disadvantaged*

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*communities as classified on the Climate and Economic Justice Screening Tool,  
<https://screeningtool.geoplatform.gov/>.*

**Joshua Valley Utility Company (as shown in Figure 1)** lies within Census Tract 04015950402 of Mohave County, Arizona. The census tract has a population of 4,267, and 45% of the population is elderly over 65. The White House Council on Environmental Quality's Climate and Economic Justice Screening Tool identifies the area served by Joshua Valley Utility Company as a disadvantaged community. It is disadvantaged because it meets more than one burden threshold AND the associated socioeconomic threshold. They are:

<b>Burdens</b>	<b>Percentile</b>	<b>Threshold</b>
<b>Climate Change:</b>		
Low-income	66 <sup>th</sup>	Above 65 <sup>th</sup> percentile.
<b>Energy:</b>		
Low-income	66 <sup>th</sup>	Above 65 <sup>th</sup> percentile.
<b>Health:</b>		
Heart disease	97 <sup>th</sup>	Above 90 <sup>th</sup> percentile.
Low-income	66 <sup>th</sup>	Above 65 <sup>th</sup> percentile.
<b>Housing:</b>		
Lack of indoor plumbing	95 <sup>th</sup>	Above 90 <sup>th</sup> percentile.
Low-income	66 <sup>th</sup>	Above 65 <sup>th</sup> percentile.
<b>Legacy Pollution:</b>		
Formerly used Defense sites	Yes	
Low-income	66 <sup>th</sup>	Above 65 <sup>th</sup> percentile.
<b>Transportation:</b>		
Low-income	66 <sup>th</sup>	Above 65 <sup>th</sup> percentile.
<b>Water and Wastewater:</b>		
Low-income	66 <sup>th</sup>	Above 65 <sup>th</sup> percentile.
<b>Workforce Development:</b>		
High school education	11%	Above 10%.

***Tribal Benefits:***

This Project does not directly serve or benefit a Tribe.

*Will the project benefit multiple sectors or users (e.g., agriculture, municipal, industrial, environmental, recreation)?*

Every gallon of water and watt of energy saved relieves pressure on already strained supplies. Phase III is estimated to reduce water use by 4.70 acre-feet a year. It is also estimated to reduce annual energy use by 4,980.6 kWh and GHG emissions by 3.6 MT CO2e. The conserved water and energy will remain available in the system to benefit multiple residential, commercial, agricultural, industrial, and recreational sectors.

*Will the project benefit from a larger initiative to address sustainability?*

Surface water and groundwater throughout the region face constant tension as demands for water from increasingly strained sources continue to grow. With 67% of Arizona under extreme drought conditions and declining groundwater levels throughout the State, tensions are increasing. Phase III helps decrease groundwater demands.

## 2 Project Budget

### 2.1 Funding Plan

JVUC will provide the non-Reclamation share of the project costs through its annual budget. The cost breakdown is shown in the table below. No additional funding commitments have been pursued for this project's scope.

FUNDING SOURCE	% OF PROJECT	FUNDING AMOUNT
<b>Non-Federal Entities</b>		
<b>Joshua Valley Utility Company</b>	50%	\$100,432
<i>Non-Federal Subtotal:</i>	50%	\$100,432
<b>Other Federal Entities</b>		
N/A	0%	
<i>Other Federal Subtotal:</i>	0%	
<b>Requested Reclamation Funding:</b>	50%	\$100,000
<b>TOTAL PROJECT FUNDING:</b>	100%	\$200,432

### 2.2 Budget Proposal

The proposed budget breakdown by funding source for the project is provided in this table.

	AMOUNT
Costs to be reimbursed with Reclamation funding	\$100,000
Costs to be paid by the applicant	\$100,432
Value of third-party contributions	\$0
<b>TOTAL PROJECT COST:</b>	<b>\$200,432</b>

The proposed budget for the project is provided in this table.

<b>Phase II AMR Water Conservation Management Plan Budget Summary</b> <b>The figures in this summary table are calculated from entries made in subsequent categories; only blank white cells require data entry.</b>			
<b>Budget Object Category</b>	<b>Total Cost</b>	<b>Federal Estimated Amount</b>	<b>Non-Federal Estimated Amount</b>
a. Personnel	\$0		
b. Fringe Benefits	\$0		
c. Travel	\$0		
d. Equipment	\$0		
e. Supplies	\$156,432		
f. Contractual	\$44,000		
g. Construction	\$0		
h. Other Direct Costs	\$0		
i. Total Direct Costs	\$200,432		
j. Indirect Charges	\$0		
<b>Total Costs:</b>	<b>\$200,432</b>	<b>\$100,000</b>	<b>\$100,432</b>
	<b>Cost Share %:</b>	<b>49.9%</b>	<b>50.1%</b>

## 2.3 Budget Details and Narrative

### a. Personnel

**Narrative:** The project is not requesting funds for personnel.

### b. Fringe Benefits

**Narrative:** The project is not requesting funds for fringe benefits.

### c. Travel

**Narrative:** The project is not requesting funds for travel.

### d. Equipment

**Narrative:** The project is not requesting funds for equipment.

<b>e. Supplies</b>					
<b>Supply Item</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total Cost</b>	<b>Basis of Cost</b>	<b>Purpose</b>
5/8" x 3/4" Master Meter BLMJ Meter with 3G Mobile AMR Register	400	\$391.08	<b>\$156,432</b>	vendor quote	AMR-capable water meter
<b>Total:</b>			<b>\$156,432</b>		

**Narrative:** The supplies for the project are for the individual Master Meter BLMJ water meters equipped with 3G Mobile AMR registers. Southwestern Utility Management provided the vendor quote.

<b>f. Contractual</b>				
<b>Contractor Name</b>	<b>Purpose and Contracting Method</b>	<b>Total Cost</b>	<b>Description</b>	<b>Basis of cost</b>
Southwestern Utility Management	Meter removal and new meter installation	<b>\$44,000</b>	Contracted Services	per meter contracted pricing from a local vendor
<b>Total:</b>		<b>\$44,000</b>		

**Narrative:** The estimated cost of the contracted portion of the project is \$44,000 for the removal and installation of new AMR-capable meters and registers. The project affects 400 meters within the JVUC CC&N. Southwestern Utility Management is scheduled to provide the contracted services. The procurement method will be a contract between JVUC and Southwestern Utility Management.

#### **g. Construction**

**Narrative:** The project is not requesting funds for construction.

#### **h. Other Direct Cost**

**Narrative:** The project is not requesting funds for other direct costs.

#### **i. Total Direct Cost**

**Narrative:** The total direct project costs are \$200,432.

#### **j. Indirect Charges**

**Narrative:** The project is not requesting funds for indirect charges.

### Third-Party In-Kind Contributions

The project is not requesting third-party in-kind contributions.

### Environmental and Regulatory Compliance Costs

The project is not requesting funds for environmental and regulatory compliance costs.

### Total Costs

The proposed project's total cost is \$200,432. The JVUC requests \$100,000 from Reclamation to fund the project, which **represents 49.9% of the total project cost**. No other Federal funding has been requested or received for Phase III.

## 3 Environmental and Cultural Resource Considerations

*Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work affecting the project area's air, water, or animal habitat. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.*

Phase III will not require earth-disturbing work affecting the project area's air, water, animal habitat, or surrounding environment.

*Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?*

We are not aware of any endangered species in the project area.

*Are wetlands or other surface waters inside the project boundaries potentially falling under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.*

None of which we are aware of. All work will occur within sites that have previously been disturbed.

*When was the water delivery system constructed?*

The water delivery system was constructed beginning in 1966.

*Will the proposed project result in any modification of or effects on the individual features of an irrigation system? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.*

Phase III will not modify or affect individual features of an irrigation system. Phase III is centered around upgrades to water meters and will not involve irrigation systems.

*Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.*

Phase III will not modify or affect buildings, structures, or features, so the program's implementation will not affect cultural resources.

*Are there any known archeological sites in the proposed project area?*

There are no known archeological sites in the JVUC CC&N.

*Will the proposed project have a disproportionately high and adverse effect on low-income or minority populations?*

Phase III will occur throughout the JVUC's CC&N, including low-income populations, with no disproportionate impacts or benefits from program implementation anticipated. AMR provides information on water consumption, which may benefit low-income customers due to an anticipated increase in leak detection and prompt response, thus lowering water bills.

*Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*

No, it will not.

*Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?*

Phase III will not include any habitat alteration components. The program would not contribute to introducing, continuing, or spreading noxious weeds or non-native invasive species in the project area.

## 4 Required Permits or Approvals

Phase III is in JVUC's CC&N and will not require extensive permitting work. Funding is not being requested for permitting and environmental tasks, and no costs are included in the budget for such activities.

## 5 Letters of Project Support

No letters of support are included in this application.

## 6 Official Resolution

A Board resolution was signed to authorize the President to apply for this WaterSMART grant.

Resolution NO. 2024-06-28 is in **Attachment A**, which provides the following:

- Identification of the official with legal authority to enter into an agreement.
- Board support of the application.
- Verification of applicant's ability to provide the funding match.
- Verification of applicant's willingness to work with Reclamation to meet established deadlines for entering into a cooperative agreement.

## 7 Single Audit Reporting Statement

JVUC did not spend more than USD 750,000 in federal award funds and was not required to submit a single audit report for the most recently closed fiscal year.

## 8 Conflict of Interest Disclosure

JVUC currently has no actual or potential conflicts of interest and will notify Reclamation immediately in writing of any conflict of interest arising during the life of this Federal award.

## 9 Overlap or Duplication of Efforts Statement

JVUC received \$100,000 in American Rescue Plan Act (ARPA) funding for **Phase I** for replacing 250 5/8" x 3/4" manual read meters with new, accurate meters with AMR technology, provisioning a field-ready AMR laptop reading system, licensing and third-party fees, and field training, startup, and integration with an existing customer service portal.

JVUC has been awarded a \$100,000 grant under the WaterSMART Small-Scale Water Efficiency Projects, NOFO R24AS00059, Application Period 1, for **Phase II** to upgrade 400 meters to advanced meter reading (AMR) technology.

This application is for another \$100,000 grant under the WaterSMART Small-Scale Water Efficiency Projects, NOFO R24AS00059, Application Period 2, for **Phase III**, to upgrade 400 manual read meters to advanced meter reading (AMR) technology. JVUC has not been awarded or received any other State or Federal funding for the proposed Phase III work.

**The scope of work for Phases I, II, and III does not overlap.** In Phases I, II, and III, JVUC will replace 1,050 manual-read water meters (250 in Phase I, 400 in Phase II, and 400 in Phase III) with Master Meter AMR meters.

**The potential for overlap exists with JVUC's application for a WaterSMART Water and Energy Efficiency Grant, NOFO R24AS00052,** to upgrade 810 manual read meters to advanced

meter reading (AMR) technology. Currently, the application is under review by Reclamation. If JVUC were awarded a WaterSMART Water and Energy Efficiency Grant, JVUC would utilize funds awarded up to but not exceeding an amount necessary to complete Phase III.

## **10 Automated System Application Payment (ASAP) Registration**

JVUC will register upon invitation notification and acceptance of the application. JVUC will maintain an active ASAP account during the period of any federal assistance agreement.

## **11 System for Award Management (SAM) Registration**

Joshua Valley Utility Company is registered in SAMS.

- Registered Name: Joshua Valley Utility
- UEI: #RAA4LEAK1HZ2
- MEADVIEW, AZ, USA

## **12 Attachments A - G**

- A: JVUC Resolution
- B: JVUC 2022 ACC Annual Report
- C: Southwestern Utility Management Budget Estimate
- D: JVUC Specification for BLMJ Meters
- E: JVUC Specification for Radio-Based Automatic Meter Reading
- F: Master Meter Brochure for Dialogue 3G Mobile AMR
- G: City of Smyrna, GA AMR Case Study

## ATTACHMENT A

### JOSHUA VALLEY UTILITY COMPANY RESOLUTION NO.: 2024-06-28

**WHEREAS**, Joshua Valley Utility Company is authorized to submit a proposal to the US Bureau of Reclamation in response to the WaterSMART Small-Scale Water Efficiency Projects Grant Funding Opportunity for Fiscal Years 2024 and 2025 (Application Period 2) to conduct Phase III: upgrade 400 meters to Automated Meter Reading (AMR) Technology within its distribution system. The project will reduce water losses and more effectively manage water demand.

**NOW, THEREFORE, BE IT RESOLVED** that the Joshua Valley Utility Company agrees to and authorize the following:

- The Joshua Valley Utility Company has reviewed and supported the proposal submitted;
- The Joshua Valley Utility Company can provide the amount of funding needed for the matching grant from the WaterSMART program and
- If selected for a WaterSMART grant, Joshua Valley Utility Company will work with Reclamation to meet the established deadlines for entering into a cooperative agreement.

This resolution was adopted by

**JOSHUA VALLEY UTILITY COMPANY**

On June 28, 2024



President



Member of the Board