

# **GRANT APPLICATION**

**WaterSMART Grants Program:  
Water and Energy Efficiency Grants for Fiscal Year 2022  
Funding Opportunity No. R22AS00023**

**US Department of the Interior, Bureau of Reclamation**

## **PROJECT TITLE:**

“City of Santa Cruz Advanced Metering Infrastructure Replacement Project”

**SUBMITTED BY THE CITY OF SANTA CRUZ**



**November 3, 2021**

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- E – Professional Services Agreement for Implementation Management for Meter Replacement Program (Jacobs Engineering Group, Inc., dated June 16, 2021)

## ACRONYMS

AF	acre feet
AFY	acre feet per year
AMA	Advanced Metering Analytics
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
ASR	aquifer storage and recovery
AWWA	American Water Works Association
bgy	billion gallons per year
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
gpcd	gallons per capita per day
MG	million gallons
mgd	million gallons per day
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
SCWD	Santa Cruz Water Department
WSAC	Water Supply Advisory Committee

# Section I. Technical Proposal and Evaluation Criteria

## 1. Executive Summary

This application for the project “City of Santa Cruz Advanced Metering Infrastructure Replacement Project” for Fiscal Year 2022 WaterSMART Water and Energy Efficiency grant funds is submitted on November 3, 2021 by the City of Santa Cruz Water Department (SCWD) in Santa Cruz County, California. The City is a Category A applicant.

The project will replace a total of 15,050 individual water meters in the SCWD service area with new Badger Advanced Metering Infrastructure (AMI) meters and Badger ORION radios. This project is part of a larger system-wide effort to replace approximately 23,900 meters in the service area with AMI technology in order to upgrade aging meters and to consolidate the City’s meter reading system onto a single AMI platform (Badger). The project is expected to result in a water savings of 663 acre-feet/year (AFY). These savings are significant for the City of Santa Cruz, which relies entirely on local water supplies and is extremely vulnerable to drought. The AMI project will help reduce impacts of climate change through energy savings in water production and distribution as well as reduced carbon emissions resulting from fewer vehicle miles. These energy efficiency improvements will result in an energy savings of 480,863 kilowatt hours per year and an expected reduction in greenhouse gas emissions of 55.6 metric tons, or 122,577 pounds, of CO<sub>2</sub> equivalent per year. The AMI meter replacement project will significantly increase the City’s water system efficiency, water reliability, and water supply resiliency to drought.

The expected grant period is 10 months, from June 1, 2022 to March 31, 2023. The project is not located on a Federal facility.

## 2. Project Location

The project “City of Santa Cruz Advanced Metering Infrastructure Replacement Project” is located in the Santa Cruz Water Department (SCWD) service area in Santa Cruz County, California. The City of Santa Cruz is located 75 miles south of San Francisco along the northern shore of Monterey Bay. The SCWD service area encompasses an area approximately 20 square miles in size, including the entire City of Santa Cruz, adjoining unincorporated areas of Santa Cruz County, a small part of the City of Capitola, and coastal agricultural lands north of the city. The project area latitude is approximately 36.975270 (36° 58’ 30.972”N); longitude is approximately -122.028560 (122° 1’ 42.816”W).

Figure 1 on the next page shows the project area in context with the larger region, highlighting the City’s water supply sources.

Figure 1. City of Santa Cruz AMI Replacement Project – Vicinity Map



### 3. Technical Project Description

#### Background and Approach

The City of Santa Cruz produces and delivers water to over 98,000 people in the City of Santa Cruz, unincorporated Santa Cruz County, and parts of the City of Capitola. The Santa Cruz Water Department (SCWD, or City) has over 27,000 meters, with 24,592 active meters generating approximately \$35 million in annual volumetric water sales (approximately 3,000 of the City's meters are fire service meters, all of which have recently been replaced with Advanced Metering Infrastructure [AMI] technology).

SCWD currently uses five disparate meter reading methods: Sensus AMI, Sensus Automatic Meter Reading (AMR), Badger ORION AMI, touch pads, and manual reads. The vast majority of meter reads are acquired through the Sensus drive-by AMR system, which is reaching, or has already surpassed, the end of its useful life.

In 2018, SCWD contracted with Jacobs Engineering Group, Inc. to perform a Feasibility Study to investigate the viability of a system-wide replacement of the City's metering infrastructure with AMI (the Feasibility Study is attached as Appendix B). Following are the key findings:

- The average age of the existing meter population is 17 years with 20 percent of the population exceeding the expected useful life of 20 years.
- Based on the age of current meters, it is expected that a significant number of radio batteries (representing approximately 40 percent of the customer base) will fail in the next few years.
- Approximately 10 percent of the City's residential meters are estimated to be stuck, resulting in significant lost revenue for the City.
- Failing meters and meter reading equipment are a drain on current resources and are hindering the staff's ability to efficiently acquire accurate readings to bill its customers.
- 60 percent of the Meter Shop staff time is spent manually retrieving meter reads via individual truck-rolls to failed meters.

Based on the Feasibility Study's key findings and results of an extensive cost-benefit analysis, system-wide AMI meter replacement was recommended as the preferred option.

The proposed project is part of this system-wide effort to upgrade aging meters with AMI technology and to consolidate the City's meter reading system onto a single AMI platform. SCWD plans to install an estimated 23,900 AMI meters and endpoints throughout its service area, including residential, business, industrial, municipal, and irrigation meters. SCWD will

replace all meters older than five years old with Badger AMI meters, and will replace all Sensus FlexNet radios plus the existing AMR/touch-read radios with Badger ORION radios. The installation process is scheduled to begin with pre-deployment planning and interface development in November 2021, funded with SCWD Enterprise Funds. SCWD is requesting federal grant funds to support the AMI meter installation process beginning in June 2022. The installation is expected to be completed by December 2022. We estimate a total of 15,050 meters will be replaced during the grant period (with an additional 8,850 meters having been installed prior to the grant period, between January and May 2022).

### **AMI Meter Procurement**

On October 5, 2021, SCWD entered into an agreement with Badger Meter, Inc. to purchase an estimated 23,790 E-series Ultrasonic Stainless Steel AMI meters (sizes from 5/8” to 2”), 24,300 endpoints for encoder ORION CELLULAR-LTE, plus additional meters of other models and sizes, and parts and appurtenances (see Badger Meter, Inc. Agreement, Appendix C). SCWD intends to purchase meters and endpoints between December 2021 and January 2022. SCWD will purchase Nicor meter box lids separately during the same time period and provide them to the installation contractor on an as-needed basis.

SCWD will be using Badger BEACON Advanced Metering Analytics (AMA) software for the Meter Data Management System and WaterSmart cloud-based software for the customer web portal. Both will require integration and configuration with SCWD’s billing system.

### **AMI Meter Installation**

On October 11, 2021, SCWD entered into an agreement with Utility Partners of America LLC (UPA) to install the AMI meters (Appendix D). The AMI meter installation is expected to take approximately 12 months, January through December 2022. Mobilization will begin one to two months prior to meter installation, and includes all preliminary activities such as hiring crews, training crews, and materials management. The meter installer, UPA, is required to hire from the local Santa Cruz labor pool. UPA will train locally hired individuals on all aspects of meter installation to efficiently execute the meter replacement project according to the contract. UPA will be responsible for managing the materials for installation by maintaining the inventory of meters and requisite components during the course of the project to ensure adequate supply.

AMI meter installation will occur in two phases: A “slow start” followed by full launch. The slow start will occur in January 2022 and will enable SCWD to address any issues. During the slow start, SCWD, UPA, Badger, and the Implementation Management contractor will evaluate the work flow, meter and meter interface unit installation, data management, and problem resolution to ensure they are working and effective. SCWD will work with the installer to modify



any procedures that are deemed deficient or ineffective. The full launch will then ensue with route-by-route installation.

All meter replacements will be done by billing route and according to billing schedule. UPA will be responsible for ensuring that meter installations do not occur within the window of the meter read date and billing date so as to avoid errors and confusion related to on-time meter reading and billing. UPA will work with SCWD to develop a detailed set of installation specifications and standard operating procedures. UPA will also be required to provide customer support.

### **Implementation Management for Meter Replacement**

On June 16, 2021, SCWD entered into an agreement with Jacobs Engineering Group, Inc. (Appendix E) to provide implementation management for the AMI meter replacement. Implementation management involves oversight of all parties involved, contract management, and general coordination to ensure the successful deployment of an end-to-end solution. Jacobs's scope of work includes:

- Software Integration and Interfaces: Facilitate integration of the Badger AMA meter data management system software and WaterSmart customer portal software with SCWD's billing and reporting system. Includes end-to-end testing needed to ensure that data flows between the various software solutions prior to meters being installed.
- Communication: Develop the internal and external communications plan, and workflow and communication verification.
- AMI Installation Management: This task will provide the bulk of the effort to manage quality, schedule, and cost performance of the vendors, field installation, and data management.
- Field Inspection Support: Provide the inspection workflow, training for SCWD inspectors as well as a program management dashboard.
- Data Analytics and Insights: Develop an analytics platform and dashboard that provide insights from the data, noting any operational improvements.
- Organizational Change Management: Guide the organizational re-structuring necessary to achieve the intended water conservation goals. Train SCWD staff to use the new AMI software platform and ensure that SCWD staff understand their new roles.
- Project Close Out: Provide a cutover and readiness plan, so SCWD is ready to transition from deployment to operations and maintenance of the new system.

## 4. Evaluation Criteria

### Evaluation Criterion A – Quantifiable Water Savings

#### *1. Describe the amount of estimated water savings.*

The estimated amount of water expected to be saved from AMI replacement during the grant period is 663 AFY. (This does not include any water savings that will derive from the AMI replacement prior to the grant period, from January through May 2022.)

#### *2. Describe current losses.*

SCWD estimates water losses that occur on the property side of the meter using both high meter readings and leak forgiveness. All meters in the city are read and billed monthly. SCWD monitors for leaks by reviewing exception reports, but these reports most likely capture only a small fraction of actual water losses. SCWD also offers a Leak Forgiveness program for leaks that are considered to be beyond the customer’s control, such as a leak that develops in an underground pipeline serving a property. Customers can apply for leak forgiveness just once in a two-year period. In 2019, total water losses identified through the Leak Forgiveness Program equaled 28.9 MG, or 88.7 AF. This represents just 1.5 percent of residential and business water use for that year.

Since data is limited with regard to actual water losses on the customer’s side of the meter, a better option for estimating property-side water losses is to apply the results of end use studies to the City’s recent water consumption data. We considered two studies:

A 2016 study prepared by Aquacraft Inc. and sponsored by the California Department of Water Resources, titled “California Single-Family Water Use Efficiency Study,” documents an average leakage rate of 30.7 gallons (.03439 AFY) per household per day. Using this study as a basis, we calculate the expected average water leakage from 24,592 connections, which is the number of active meters in the district, to be 845.7 AFY (.03439 AFY x 24,592).

These results are roughly consistent with a 2019 study conducted by the Water Research Foundation, titled “Residential End Uses of Water, Version 2.” This study found on average 14 percent of indoor residential water use to be attributable to leaks. Applying a 14 percent leakage rate more broadly to residential and business water use in Santa Cruz for the year 2020, the amount of leakage would equal 828.4 AF.

The water loss estimates calculated by applying the methods used in these two studies indicate much higher volumes than those identified through SCWD’s Leak Forgiveness program – which

indicates a potential for AMI to catch low-volume, persistent leaks that do not necessarily prompt customers to apply for leak forgiveness but are nonetheless present in the system.

Note that in addition to property side leak management, SCWD conducts audits of the distribution system annually to account for unmetered water uses and to track how much water is lost to leakage over time. The City uses American Water Works Association (AWWA) water balance software to help quantify and track water losses associated with the water distribution system. The AWWA audit uses SCWD production meters and customer meters to determine the losses in between. One important benefit to the system-wide AMI installation is replacing aging, underperforming meters. Having accurate meters through AMI replacement will allow SCWD to better understand the system losses.

*a. Explain where current losses are going.*

Leaks that occur in underground pipes are seeping into the ground. Water losses that occur indoors due to faulty plumbing or other means, such as water left running, enter the municipal waste stream.

*b. If known, please explain how current losses are being used. For example, are current losses returning to the system for use by others? Are current losses entering an impaired groundwater table becoming unsuitable for future use?*

Current water losses are not being used. Most residential water consumption in Santa Cruz (75-80 percent) occurs indoors. Water losses that occur indoors enter the municipal waste stream and get treated and discharged to the Monterey Bay, rendering it unsuitable for future uses. Water leaked from underground pipes seeps into the ground. Water seeped into the ground does not provide appreciable recharge benefit to underlying aquifers since groundwater recharge potential in Santa Cruz is extremely limited at the surface and requires deep wells to effectively recharge the basin. This water is essentially lost to the system.

*c. Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?*

There are no known benefits associated with water loss in Santa Cruz. Water losses that occur indoors due to plumbing leaks or other means ultimately wind up in the Pacific Ocean. Water leaked from underground pipes provides no known benefit to wildlife as there is no meaningful connectivity to streams or wetlands.

The majority of outdoor water usage is associated with maintaining outdoor landscaping. When a leak of this nature occurs, water can flood the area and feed into nearby surface waters or storm

drains. The flooded water that flows to streams may provide some benefit for aquatic species. However, that runoff also picks up and carries pollutants into surface waters and the Monterey Bay National Marine Sanctuary. It can generally be said that the water losses that occur in Santa Cruz, whether indoor or outdoor, are not being put to their highest and best use.

### *3. Describe the support/documentation of estimated water savings.*

The estimated water savings is 663 AFY, including 414 AFY from reduction in losses due to leakage, and 249 AFY from water use reduction (conservation). The total savings amount has been calculated as follows.

Estimated Water Savings from Reduction in Losses due to Leakage: To determine water savings, we use the 2016 Aquacraft Inc. study, titled “California Single-Family Water Use Efficiency Study,” as a basis for calculations. The study documents an average leakage rate of 30.7 gallons (0.03439 AFY) per household per day. SCWD will install a total of 15,050 AMI meters during the grant project period. We therefore calculate the expected average water leakage from 15,050 connections to be 517.6 AFY (0.03439 AFY x 15,050).

With AMI technology, SCWD will be able to detect and address leaks much more quickly, and to detect slow leaks that might otherwise go unnoticed indefinitely. Recognizing that it would be impossible to address 100 percent of leaks, we assume that AMI technology will enable SCWD to reduce overall leakage by 80 percent. Hence the amount of water saved from reduction in losses due to leakage is calculated to be **414 AFY** (517.6 x 0.80).

Estimated Water Savings from Water Use Reduction: The proposed project will allow customers real-time monitoring of their water usage through a customer web portal, using the BEACON Advanced Metering Analytics (AMA) cloud-based software. The web portal gives customers the ability to monitor and manage their water use by providing water consumption data in 15-minute, hourly, daily, monthly and yearly intervals.

Several studies have shown significant water savings that have resulted from customer interaction with AMI customer web portals. Two of these studies include: 1) A 2013 case study conducted by IBM Research and published by Dave Hanes found that customers who used an AMI portal conserved an average of 6.6 percent more water than those with standard billing procedures.<sup>1</sup> 2) Results reported by the Texas A&M University System from a 2012 study conducted with Arlington Water Utilities, and based on over 35,000 AMI meters, indicated AMI

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<sup>1</sup> Dave Hanes. “Every Drop Counts: How Water Utilities Are Putting Water Efficiency First.” *Journal (American Water Works Association)*, vol. 105, no. 6, American Water Works Association, 2013, pp. 78–81, <http://www.jstor.org/stable/jamewatworass.105.6.78>.

customer portal users reduced their water use by an average of 8.7 percent in the wintertime and 17 percent in the summertime compared to nonportal users.<sup>2</sup>

The City of Santa Cruz already has one of the lowest per capita water consumption rates in the state of California: The annual residential per capita use in 2020 was 47 gallons per capita per day (gpcd) and the gross per capita use was 74 gpcd.<sup>3</sup> Demand hardening makes further reductions difficult to achieve. Thus, while the studies cited above show water use reductions ranging from 6.6 to 17 percent for AMI customer portal users, we conservatively estimate a 3 percent water use reduction resulting from Santa Cruz customer use of the AMI web portal. A 3 percent water savings resulting from reduced water use translates to 249 AFY in water savings. This is calculated as follows.

By the time the project is completed (including meters installed prior to the grant and meters installed during the grant period), all 24,592 active meters in the SCWD service area will be outfitted with AMI technology. Since SCWD has yet to educate its existing AMI customers about the benefits of using the BEACON web portal, we count all AMI meters systemwide when considering the water conservation benefit (3 percent water savings) associated with customer use of the portal.

Over the expected lifespan of the AMI meters between the years 2025 - 2045, SCWD projects a total annual average water consumption of approximately 8,286 AFY (2,700 MG). Applying a 3 percent water savings to the total annual consumption results in a water savings of **249 AFY**.

In summary, the total expected water savings equals **663 AFY**:

$$\begin{aligned} &414 \text{ AFY: Water savings from reduction in losses due to leakage} \\ &+ \underline{249 \text{ AFY: Water savings from water use reduction}} \\ &663 \text{ AFY} \end{aligned}$$

The total water savings of 663 AFY represents an 8 percent savings in the City’s total annual consumption.

*4. Please address the following questions according to the type of infrastructure improvement you are proposing for funding: Municipal Metering.*

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<sup>2</sup> Dustan Compton. “Sharing AMI Data with Customers: An Arlington Experience.” Tarrant Regional Water District slide presentation, 2012.  
<sup>3</sup> City of Santa Cruz 2020 Draft Urban Water Management Plan.

- a. How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

Please see response to the question above.

- b. How has the potential for reductions in water use by individual users been determined?*

The calculations for determining estimated water savings using AMI are based on studies conducted by IBM Research (2013) and by the Texas A&M University System (2012), as described above. SCWD customers are already highly motivated to conserve water, as indicated by the City's extremely low per capita water use average. What they lack is information. We expect the real-time water use data provided by the AMI web portal will help our customers gain a better understanding of their water usage patterns and enable them to improve further upon their conservation efforts.

- c. For installing end-user water service meters, e.g., for a residential or commercial building unit, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.*

Please see Evaluation Criterion A, Question 3 (documentation of estimated water savings) for a description of the studies used to base our calculations. The average residential leakage rate, which is used to calculate water savings due to improved detection and response to leaks, is derived from a 2016 study on California single-family households. We used this study specifically on account of its focus on California households. The two studies on which we base our calculations for water savings due to reduced water use are not local studies; however, we consider those studies indicative of the amount of water savings possible through customer use of the AMI portal generally, and we use a very conservative water savings estimate to take into account demand hardening in the Santa Cruz region.

SCWD did conduct a small pilot study in 2018 for approximately 400 irrigation customers using the Badger ORION cellular platform. The study considered customer utilization of the online web portal and any associated changes in customer behavior with regard to leaks. There was clear evidence that accessing the online web portal reduced leak duration and resulted in fewer leaks at any given time; however, this did not translate into a statistically significant reduction in water consumption, likely because overall consumption for irrigation use was high, and leak volumes among those accounts were relatively low.

- d. Installation of distribution system meters will not receive points under this criterion. Accordingly, these projects must be paired with a complementary project component that will result in water savings in order for the proposal to receive credit for water savings, e.g., pipe installation using upgraded materials, or individual water service meters.*

N/A

- e. What types (manufacturer and model) of devices will be installed and what quantity of each?*

Over the course of the entire AMI meter replacement effort, SCWD will be installing an estimated 23,900 Badger AMI E-Series Ultrasonic Stainless Steel meters and Badger ORION CELLULAR-LTE endpoints. Meter sizes include: 5/8", 3/4", 1", 1.5", and 2". Approximately 8,850 AMI meters/endpoints will be installed prior to the grant period, and an estimated 15,050 meters/endpoints will be installed during the grant period. It is not known at this time how many of which size meters will be installed when.

*How will actual water savings be verified upon completion of the project?*

Water savings will be verified by comparing baseline water use with post-installation water use for a randomized sample of 200 single-family residential accounts, according to a monitoring plan. Section I.5 Performance Measures describes the monitoring plan. While the water savings benefit may not be evident immediately upon completion of the project, monitoring will continue for two years post-installation in order to quantify water savings.

## **Evaluation Criterion B – Renewable Energy**

### **Subcriterion No. B.2 – Increasing Energy Efficiency in Water Management**

- 1. Describe any energy efficiencies that are expected to result from implementation of the water conservation or water efficiency project (e.g., reduced pumping).*

The water savings that will result from AMI metering will enable SCWD to reduce surface water diversions and groundwater pumping in summer months and during multiple dry years, reduce treatment, and reduce vehicle miles driven for meter reads each year. These energy efficiencies will result in significant energy savings and greenhouse gas emission reductions, as described below.

- a. *If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations.*

The energy savings expected to result from the project is **480,863 kilowatt hours per year** (kwh/year). This estimate is based on system-wide energy savings expected to result from installing 15,050 AMI meters throughout the SCWD service area. Energy uses in the SCWD water system include:

- Extraction and diversion: Energy is used to operate equipment at diversion facilities and wells
- Conveyance: Energy is used at booster and pump stations to convey raw water
- Treatment: Energy is used at surface water and groundwater treatment facilities
- Distribution: Energy is used at pump stations to convey treated water and at reservoir/tank sites within the distribution system

SCWD uses a system-wide energy intensity calculation of 2,227.1 kwh per million gallons. This is based on the total annual energy consumed by the water system divided by total annual volume of water produced for the year 2020.<sup>4</sup> Given an expected water savings with AMI of 663 AFY (215.9 mgy), the energy savings is calculated as follows:

$$215.914 \text{ mgy savings} \times 2,227.1 \text{ kwh/mg} = 480,863 \text{ kwh/year}$$

- b. *How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions.*

The AMI project will help offset the impacts of climate change through energy savings in water production and distribution as well as reduced carbon emissions resulting from fewer vehicle miles otherwise traveled for meter reading. These energy efficiency improvements will result in an expected reduction in greenhouse gas emissions of **55.6 metric tons**, or **122,577 pounds**, of CO2 equivalent per year:

$$\begin{array}{r} 32.9 \text{ metric tons/year CO2 equivalent due to system-wide energy savings} \\ + \underline{22.7} \text{ metric tons/year CO2 equivalent from fewer vehicle miles driven} \\ 55.6 \text{ metric tons/year CO2 equivalent} \end{array}$$

These calculations are as follows.

*Reduced emissions resulting from energy savings in water production and distribution:* We assume an energy savings of 480,863 kwh/year due to system-wide energy efficiencies achieved

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<sup>4</sup> City of Santa Cruz 2020 Urban Water Management Plan.



through water savings. Based on the US EPA calculator,<sup>5</sup> these energy savings would translate to 341 metric tons (751,289 pounds) of CO2 equivalent per year. The US EPA uses a greenhouse gas emissions intensity factor of 1.563 pounds of CO2 equivalent per kilowatt hour (lbs CO2e/kwh). SCWD’s power provider, Central Coast Community Energy (3CE), a community power provider committed to clean and renewable energy, recently published a 2021 greenhouse gas emissions intensity factor of 0.151 lbs CO2e/kwh. Since 3CE is SCWD’s energy provider, this would seem to be the more appropriate factor to use for calculating greenhouse gas emission reductions. Therefore:

$$480,863 \text{ kwh/year} \times 0.151 \text{ lbs CO2e/kwh} = 72,610 \text{ pounds, or } \mathbf{32.9 \text{ metric tons}}, \text{ of CO2 equivalent per year}$$

*Reduced emissions resulting from fewer vehicle miles driven:* Calculations are based on 2018 actual miles driven for each vehicle in SCWD’s fleet for meter reads, as shown in Table 1.

**Table 1. Gallons of Gas Used for Meter Reads in 2018**

Vehicle #	2018 gallons	% Time for Meter Reads	Gallons for Meter Reads
398	391	100%	391
400	378	100%	378
408	929	100%	929
414	841	100%	841
486	599	100%	599
399	159	10%	16
429	441	80%	353
465	843	80%	674
<b>Total</b>			<b>4,181</b>

The SCWD fleet burned about 4,181 gallons of gasoline in 2020 for meter reads. System-wide AMI metering will eliminate the need for meter reads, reducing carbon emissions correspondingly. According to the US EPA, every gallon of gasoline burned creates about 8,887 grams, or 0.008887 metric tons, of CO2 equivalent per year.<sup>6</sup> Since 15,050 meters (the number of meters to be installed during the grant period) represents 61.2 percent of total active meters (24,592) in the SCWD district, we assume the meters installed through the proposed project will reduce carbon emissions by an equivalent percentage.

Converting gallons to metric tons of CO2 equivalent per year:

$$4,181 \text{ gallons} \times 0.008887 \text{ metric tons} = 37.2 \text{ metric tons CO2 equivalent per year}$$

<sup>5</sup> EPA calculator: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

<sup>6</sup> Source: <https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle>

Emissions reduced by installing 15,050 AMI meters:

37.2 metric tons x 61.2% = **22.7 metric tons** (50,190 pounds) CO2 equivalent per year

*c. If the project will result in reduced pumping, please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements and energy usage?*

The project will result in reduced pumping and concurrent energy savings. Based on the annual kilowatt hours used in 2019, it can be noted that 77 percent of SCWD’s energy needs were related to pumping facilities: raw water pumping facilities utilized 2,999,088 kwh (54 percent of total kwh) and distribution pumping facilities utilized 1,254,618 kwh (23 percent of total kwh).<sup>7</sup> While our calculations in this proposal are based on system-wide energy savings, we might assume that 77 percent of the energy savings that result from the AMI project, or 370,265 kwh/year, will derive from reduced pumping requirements. Table 2 lists SCWD’s pumping facilities.

**Table 2. SCWD’s Pumping Facilities**

Pumping Facility	Rated Capacity	No. of Pumps	Current Capacity
<b>Raw Water Pumping</b>			
Felton Diversion Pump Station	13 MGD	3	1400 and 2250 GPM
Felton Booster Pump Station	2-13 MGD	5	1388-9022 GPM
Coast Pump Station	4.3 MGD	3	200-3000 GPM
Beltz Well 8	250 GPM	1	250 GPM
Beltz Well 9	450 GPM	1	450 GPM
Beltz Well 10	300 GPM	1	150 GPM
Beltz Well 12	500 GPM	1	200-500 GPM
Tait Well 1B	600 GPM	1	110-650 GPM
Tait Well 3B	350 GPM	1	110-350 GPM
Tait Well 4	225 GPM	1	110-225 GPM
<b>Distribution Pumping</b>			
Carbonera Pressure Pumps	200-700 GPM	2	200; 700 GPM
Carbonera Pump Station	1.8 MGD	2	1250 GPM
Felton Diversion Pump Station	12.9 MGD	3	1400-3150 GPM
Kite Hill Pump Station	0-1500 GPM	2	0-1500GPM
Morrissey Pump Station	1800 GPM	1	1800 GPM
DeLaveaga Tank Pump	150 GPM	1	150 GPM
Pasatiempo Pump Station	1.8 MGD	2	1250 GPM
Rolling Woods Pump Station	250 GPM	2	240 GPM
San Lorenzo River Pump Station	7.89 MGD	3	1-7 MGD
Springtree Pump Station	150-1500 GPM	3	0-1500GPM

<sup>7</sup> City of Santa Cruz Water Department Annual Report 2019, p. 53.

Thurber Lane Pump Station	460 GPM	2	440 GPM
University Pump Station 2	2800 GPM	4	100-2820 GPM
University Pump Station 4	2300 GPM	3	1250-2450 GPM
University Pump Station 6	1800 GPM	4	150-1900 GPM

*d. Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.*

The energy savings estimate originates from the point of diversion.

*e. Does the calculation include any energy required to treat the water, if applicable?*

The calculation does include energy required to treat the water, though as stated previously, our calculations are based on system-wide energy savings. The project will involve three treatment facilities, as shown in Table 3. According to SCWD’s 2019 Annual Report, these water treatment facilities utilized 21 percent of SCWD’s annual water production and distribution energy needs. We might therefore assume that 21 percent of the energy savings that result from the AMI project, or 100,981 kwh/year, will derive from reduced treatment requirements.

**Table 3. SCWD’s Treatment Facilities**

Pumping Facility	Rated Capacity	No. of Pumps	Current Capacity
Beltz 12 Treatment Plant	.72 MGD	1	200-500 GPM
Beltz Treatment Plant	2 MGD	2	750 GPM
Graham Hill Water Treatment Plant	24 MGD		16 MGD

*f. Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions? Please provide supporting details and calculations.*

The project will result in reduced vehicle miles driven. We expect that greenhouse gas emissions will be reduced by about 22.7 metric tons CO2 equivalent per year due to fewer “truck rolls” required for meter reads. This is based on emission calculations for actual vehicle miles driven in 2020 for meter reads, which used 4,181 gallons of gasoline, multiplied by the percentage of AMI meters in the SCWD district that will be replaced through the project. Please see calculations above in Evaluation Criterion B.1.b.

*g. Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).*

The project does not involve installation of new renewable energy components. It should be noted, however, that self-generated renewable energy is produced from solar arrays at the Graham Hill Water Treatment Plant and the Bay Street Tanks site (distribution system).

## Evaluation Criterion C – Sustainability Benefits

### 1. Enhancing Drought Resiliency

*a. Does the project seek to improve ecological resiliency to climate change?*

Climate change in the Santa Cruz region is expected to result in longer and more severe extended droughts and in changes in ongoing hydrologic patterns.<sup>8</sup> More intense winter precipitation may result in lower summer base flow. Climate change conditions are expected to significantly impact water supply reliability for both the human and aquatic species that depend on the San Lorenzo River and North Coast streams in Santa Cruz County.

While the project's primary goal is to ensure a more reliable and resilient domestic water supply for SCWD customers, an important secondary benefit of the project is increased ecological resiliency to climate change. With 95 percent of SCWD's water supply collected from surface waters, the water savings that result from the AMI project will allow SCWD to reduce diversions and leave more water in the surface water system to benefit fisheries and other aquatic needs, thereby improving drought and climate change resiliency.

*b. Will water remain in the system for longer periods of time? If so, provide details on current/future durations and any expected resulting benefits (e.g., maintaining water temperatures or water levels).*

The water will remain in the system for longer periods of time. The estimated 663 AFY in water savings will extend the availability of water for both municipal and environmental needs during dry periods and drought. The additional water will remain in the City's raw water system, available for municipal use as needed and to enhance stream flows for fisheries and other aquatic species. Improved stream flows will also help maintain cooler water temperatures for fisheries. The additional water supply will enable SCWD to reduce diversions and to offset groundwater pumping in summer months and during multiple dry years.

*c. Will the project benefit species? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act (ESA).*

The project will provide benefits for federally threatened and endangered species and state listed species. The San Lorenzo River and the North Coast streams from which SCWD diverts water

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<sup>8</sup> City of Santa Cruz Water Supply Advisory Committee Final Report on Agreements and Recommendations, October 2015, p. 21. Available at: <http://www.santacruzwatersupply.com/meeting/wsac-final-reportrecommendation-appendices>.

have been listed by the National Marine Fisheries Service (NMFS) as critical habitat for the recovery of Central California Coast steelhead (*Oncorhynchus mykiss*), which is federally listed as threatened, and for coho salmon (*Oncorhynchus kisutch*), federally listed as endangered. Impacts to coho salmon are of particular concern because coho populations south of the Golden Gate Bridge are on the brink of extirpation. These coastal streams also provide habitat for the Pacific Lamprey (*Entosphenus tridentatus*), a California State Species of Special Concern and a federal Species of Concern. Western pond turtles (*Emys marmorata*), California State Species of Special Concern, are also known to occur in the San Lorenzo River.

The proposed project will improve instream flow conditions for these special status aquatic species and will help implement recovery actions identified in *Final Coastal Multispecies Recovery Plan, Volume IV Central California Coast Steelhead* (2016), in the *Recovery Plan for the Evolutionarily Significant Unit of Central California Coast Coho Salmon* (2012), and in the *California South Central Coast Current Regional Implementation Plan* for the Pacific Lamprey. To address limiting factors, the project will contribute to the following Recovery Actions in the steelhead and coho salmon Recovery Plans:

- For steelhead – SLR-CCCS-10.1.1: Improve instream temperature conditions.
- For coho salmon – Recovery Action 4.1.1: Improve flow conditions.

The project will also implement tasks identified in the most recent California Department of Fish and Wildlife (CDFW) Recovery Task Lists for Central California Coast steelhead, including: CC-12-240-06: Design priority water conservation projects that reduce diversion and enhance instream flow during the spring, summer and fall months for steelhead.

To our knowledge none of these species are adversely affected by a Reclamation project.

*d. Please describe any other ecosystem benefits as a direct result of the project.*

More water left in the surface water system, as a result of reduced diversions, will provide benefits to all species that depend on flowing surface waters in the San Lorenzo River system and the North Coast streams, and will contribute to healthier riparian habitat, upon which a multitude of bird and other wildlife species depend.

*e. Will the project directly result in more efficient management of the water supply?*

The AMI project will result in more efficient management of the water supply by potentially enabling SCWD to downsize or delay implementation of other, more costly and more energy-intensive water supply augmentation elements, as outlined in the City's Water Supply Augmentation Strategy.

The City's Water Supply Augmentation Strategy aims at reliably making available an additional 1.2 billion gallons/year (3,683 AFY) of water supply during modeled worst-year conditions.<sup>9</sup> The Strategy consists of demand management and supply augmentation projects, which include specifically: demand management through water conservation, in-lieu water transfer, aquifer storage and recovery, and advanced treated recycled water. Demand management is the foundational element of the City's Water Supply Augmentation Strategy, with a goal of achieving water savings of 614 - 767 AFY. With an estimated water savings of 663 AFY, the proposed AMI project will enable the City to meet that demand management goal. System-wide AMI replacement may also enable SCWD to downsize or delay implementation of the other, more costly and more energy-intensive water supply augmentation elements.

## **2. Addressing a Specific Water and/or Energy Sustainability Concern**

- a. Explain and provide detail of the specific issue(s) in the area that is impacting water sustainability, such as shortages due to drought and/or climate change, increased demand, or reduced deliveries.*

The primary water sustainability concern that this project addresses is water shortage due to drought.

SCWD's reliance on local surface water sources, its limited water storage, and its physical location make the system especially vulnerable to drought:

- Ninety-five (95) percent of the City's water supplies are collected from local surface water sources.
- The remaining 5 percent of the City's water supplies are from local groundwater sources, which are limited, are in decline, and are threatened by seawater intrusion.
- The City has limited raw water storage capacity. Loch Lomond Reservoir is the City's only source of raw water storage, with a total storage capacity of 2.8 billion gallons.
- The City is physically and geographically isolated from other public water systems. Emergency interconnections with neighboring districts are limited by the lack of existing interties with neighboring districts.

SCWD's water system draws almost exclusively on local surface water sources, whose yield varies from year to year depending on the amount of rainfall received during the winter season and generated runoff that provides beneficial inflows. In normal and wet years, when rainfall and runoff are abundant, the water system is capable of meeting the community's current total and

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<sup>9</sup> City of Santa Cruz Water Supply Advisory Committee Final Report on Agreements and Recommendations, October 2015.

anticipated annual water requirements. The system is highly vulnerable to shortage in extended dry periods or critically dry years, when the flow in local streams and river sources runs low.

Water is currently stored in the City's single reservoir, Loch Lomond Reservoir (impounded by the Newell Creek Dam), to serve peak season demands. This reservoir is an integral part of the supply system. Some amount of storage is used each year, mainly in the summer and fall months when the flows in the coast and river sources decline and additional supply is needed to meet higher daily water demands. Storage is also used in winter months during storm events when water quality concerns prevent the use of the City's flowing sources.

During dry years, the system relies more heavily on water stored in Loch Lomond to satisfy demand, which draws down the reservoir level lower than usual and depletes available storage. In multi-year or critical drought conditions, the combination of very low surface flows in the coast and river sources and depleted storage in Loch Lomond Reservoir reduces available supply to a level that cannot support average dry season demands. Compounding the situation is the need to retain a certain amount of water in the reservoir if drought conditions continue into the following year. The existing system is not able to provide a reliable supply during multi-year droughts or prolonged periods of drier than normal hydrologic conditions within the source watersheds.

There have been at least six significant, multi-year dry periods since 1921. Since the 1970s, SCWD has had to declare water shortage emergencies and institute mandatory water restrictions and rationing during three separate multi-year droughts, 1976–77, 1987–1992, and 2012–15. As noted previously, climate change in the Santa Cruz region is expected to result in longer and more severe extended droughts and in changes in ongoing hydrologic patterns.

SCWD's water supply is further constrained by requirements for environmental needs. SCWD recently negotiated long-term minimum bypass flow requirements (Agreed Flows) with NMFS and CDFW as part of a newly developed Anadromous Salmonid Habitat Conservation Plan. These new flow requirements will restrict the City's ability to divert from its flowing sources and will correspondingly require increased use of stored water from Loch Lomond Reservoir and of groundwater. This will result in reduced storage in Loch Lomond Reservoir available for use during drought, thereby reducing the City's dry-year water supply reliability.

Population growth is also expected to impact SCWD's water supply reliability, though to a lesser extent than the factors described above. According to a recent population study,<sup>10</sup> the total number of people receiving water service is expected to grow to about 114,000 in 2045.

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<sup>10</sup> M.Cubed. 2021. Update of the City of Santa Cruz's Long-Range Water Demand Forecast.

- b. *Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.*

In the Santa Cruz region, energy sustainability is impacted mainly by power outages related to wildfire and storms. These power service interruptions may be expected to increase with climate change, as the risks of wildfire and severe weather intensify. To the extent that SCWD can reduce its draw upon and reliance upon the local power grid, its community power provider, Central Coast Community Energy, will have greater capacity to respond to these challenges.

- c. *Please describe how the project will directly address the concern(s) stated above. For example, if experiencing shortages due to drought or climate change, how will the project directly address and confront the shortages?*

The proposed AMI project will address the City’s water reliability concern by reducing demand on the system by an estimated 663 AF each year, thereby increasing available amounts in times of water shortage.

Notably, the high-resolution real-time water usage data made possible via the Badger BEACON AMA cloud-based software and customer portal will provide a critical tool to help customers manage their water use during water shortages. SCWD’s *Updated Interim Water Shortage Contingency Plan (2021)* outlines a very strict rationing schedule according to five stages of action, from Stage 1 Water Shortage Alert to Stage 5 Critical Water Shortage Emergency. Each customer is given a certain allocation of water to use in a billing period. If they exceed their allocation, the portion in excess of their allocation is charged a penalty. The penalty rate may be broken into multiple tiers so the more the excess usage, the higher the penalty price. Excess use penalties begin at Stage 2. At Stage 4, residential users will be required to get their usage down to just 25 gpcd.

The new AMI software will enable SCWD staff to alert customers *before* they have reached their allotments, and the online web portal will enable customers to track their water usage to avoid penalties. Without a daily use signal to customers as can be achieved through AMI, the City will be much less likely to meet overall reduction targets for the drought season. SCWD Customer Service Manager Kyle Petersen claims that implementing the *Water Shortage Contingency Plan* “will simply not be possible without AMI.”<sup>11</sup>

- d. *Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that*

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<sup>11</sup> Personal communication with Kyle Petersen, August 20, 2020.



*impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*

The water savings that result from the proposed AMI installation project will remain in the City's raw water system consisting of surface water (creeks and rivers, and Loch Lomond reservoir) and groundwater. There it will be available for municipal use when needed during extended dry periods and drought, and otherwise will be left in the system to enhance stream flow for federally listed salmonid species and other environmental needs. The additional water supply will enable SCWD to reduce diversions and to offset groundwater pumping in summer months and during multiple dry years.

*e. Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.*

No mechanism outside of normal SCWD protocols will be needed to put the conserved water to the intended use, because the intended (most beneficial) use will be to leave the conserved water in the raw water system – i.e., in Loch Lomond reservoir, the creeks and rivers, and in the ground as groundwater.

*f. Indicate the quantity of conserved water that will be used for the intended purpose(s).*

The entire 663 AFY in water savings will be used for the intended purposes, i.e., to meet SCWD customer water demand, with whatever water remaining being either stored in the City's surface water storage (Loch Lomond), or left in creeks and rivers for environmental water needs. During multiple dry years, it is expected that the entire 663 AF of conserved water would be used to reduce diversions and/or offset groundwater pumping in order to provide ample water supply to SCWD customers while meeting requirements for environmental needs.

### **3. Other Project Benefits**

#### ***A. Combating the Climate Crisis***

*1. Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.*

The City's current supply system is vulnerable to future climate conditions projected for the Santa Cruz region. Climate change is expected to result in longer and more severe extended

droughts and in changes in ongoing hydrologic patterns.<sup>12</sup> More intense winter precipitation may result in lower summer base flows reducing the time window during which water can be diverted from streams. Elevated winter flows may also limit diversions due to high sediment loads. By relying on local sources that are dominated by surface water and limited by a single reservoir, the SCWD water system is vulnerable to any combination of conditions that result in drier or warmer climate, or more intense rainfall over shorter periods of time.

Climate change is also expected to impact water demand. A 2016 study investigated weather effects on City water demand using historical data on sales and weather and expressed as the expected change in demand per a one degree F increase in average maximum daily air temperature over the entire year.<sup>13</sup> The analysis showed, based on water use patterns, demand would increase from between 0.19 to 1.38 percent for one degree increase in average daily high temperature for every customer group except industrial.

Another anticipated impact of climate change for the Santa Cruz coastal region is increasing sea level rise. Evidence shows that sea level rise is already impacting the region's groundwater.

The proposed AMI project will help address these impacts of climate change by saving an estimated 663 AFY of water through leak reduction and water conservation. The saved water will be left in the City's raw water system, providing a buffer for use during multiple dry years and drought. The water savings will also enable the City to reduce groundwater pumping and thereby help mitigate impacts related to sea level rise. In these ways the project will improve the water system's overall resiliency and sustainability under changing climate conditions.

*2. Does this proposed project strengthen water supply sustainability to increase resilience to climate change?*

Yes – see response above.

*3. Will the proposed project establish and utilize a renewable energy source?*

The project will not establish a new renewable energy source. However, the project will utilize renewable energy sources through SCWD's community energy provider, Central Coast Community Energy. 3CE supports clean energy from sources such as solar, wind, geothermal and biomass and has adopted a pathway to 100 percent clean and renewable by 2030,

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<sup>12</sup> City of Santa Cruz Water Supply Advisory Committee Final Report on Agreements and Recommendations, October 2015, p. 21. Available at: <http://www.santacruzwatersupply.com/meeting/wsac-final-reportrecommendation-appendices>.

<sup>13</sup> M.Cubed, 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD: Prepared for California Department of Water Resources, Water Use Efficiency Branch.

with a milestone to reach of 60 percent clean and renewable by 2025 (which it has already surpassed).

*4. Will the project result in lower greenhouse gas emissions?*

The project will result in an expected reduction in greenhouse gas emissions of 55.6 metric tons, or 122,577 pounds, of CO<sub>2</sub> equivalent per year. Please see response to Evaluation Criterion B.1.b above.

***B. Disadvantaged or Underserved Communities***

*1. Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community?*

Approximately 32 percent of SCWD's water service area population is economically disadvantaged, as defined in Section 1015 of the Cooperative Watershed Act and based on 2019 American Community Survey five-year data. Additionally, 22 percent of the population served by SCWD is Latino, an historically underserved population. The AMI project will directly benefit these populations by improving the reliability and resiliency of the municipal water system that serves them. The AMI project will also benefit disadvantaged communities by enabling SCWD staff and customers to detect and address water leaks more often and more quickly, resulting in potentially substantial water cost savings for customers. The AMI project will also empower customers to better manage their ongoing water use and related costs.

*2. If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged community definition in Section 1015 of the Cooperative Watershed Act, which is defined as less than 100% state annual MHI.*

According to American Community Survey 2019 five-year data, the annual median household income for the state of California for the period 2015-2019 was \$75,235. Using block group data from the US Census, 32 percent of the total population residing within the SCWD service area had annual median household incomes less than \$75,235.<sup>14</sup>

*3. If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing particular*

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<sup>14</sup> This does not include the population in block groups for which there is no data.

*characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.*

Almost a quarter of SCWD's service area (22 percent) is Hispanic.<sup>15</sup> Latino populations are traditionally underserved in California, due in large part to language and cultural barriers and often limited educational opportunities. Latino populations in California, for example, have been shown to experience unequal access to healthcare,<sup>16</sup> homeownership,<sup>17</sup> and desirable employment opportunities.<sup>18</sup> The AMI metering project, with installation occurring throughout the entirety of SCWD's service area, will provide equal benefit to Latino populations as to all other populations.

### ***C. Tribal Benefits***

- 1. Does the proposed project directly serve and/or benefit a Tribe? Will the project increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe?*

While there are no designated Tribal lands in the project area, members of the Amah Mutsun Tribal band of the Ohlone/Costanoan Native Americans do live in Santa Cruz and are served by SCWD water. The AMI project will directly serve and benefit members of the Amah Mutsun Tribe by increasing water supply sustainability and resilience to drought and climate change impacts, as described previously. The project will not provide renewable energy.

- 2. Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other tribal benefits such as improved public health and safety through water quality improvements, new water supplies, or economic growth opportunities?*

The AMI project directly supports Tribal resilience to drought and climate change impacts by providing increased water supply reliability and sustainability. The project is consistent with the Amah Mutsun conservation goals and ethic, which includes conserving and restoring natural resources within the traditional territories of indigenous Amah Mutsun peoples, and stewarding the land and waters.<sup>19</sup> All of SCWD's service area lies within the traditional territory of the

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<sup>15</sup> Based on 2019 5-year American Community Survey data.

<sup>16</sup> See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4662077/>.

<sup>17</sup> For example, in 2019, the Latino homeownership rate in California was 49 percent compared with 68 percent for White populations (source: <https://www.calhfa.ca.gov/community/index.htm>).

<sup>18</sup> <https://www.latimes.com/california/story/2020-08-26/latinos-find-job-choices-are-both-limited-limiting>.

<sup>19</sup> Amah Mutsun website: <https://www.amahmutsunlandtrust.org/our-vision>

Amah Mutsun Tribe. The additional water conserved through the AMI project will be “stored” in SCWD’s raw water system – which includes Loch Lomond Reservoir, the North Coast creeks, and the San Lorenzo River – where it will benefit fisheries and other aquatic needs.

#### ***D. Other Benefits***

*1. Will the project assist States and water users in complying with interstate compacts?*

N/A. The project will not assist the State or water users in complying with interstate compacts.

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

The AMI installation project will benefit multiple sectors and users. SCWD’s water system serves over 98,000 people through 24,592 active service connections, with over 27,000 meters total (some of which are fire service).<sup>20</sup> Current water uses include residential (62%), business (21%), industry (8%), municipal (3%), landscape irrigation (5%), and coastal agricultural irrigation (1%). The project will be implemented across all sectors, providing improved water service and potential cost savings to all water users in the city. In addition, some of the water conserved through the project will remain stored in Loch Lomond, benefiting recreational uses at Loch Lomond Recreation Area. The Recreation Area is used by residents for boating, swimming, fishing, picnicking, and other recreational activities.

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

The project will benefit a larger initiative to address water reliability by supporting “Element 0: Demand Management,” one of the four elements of the City’s Water Supply Augmentation Strategy. Element 0 establishes a goal to generate an additional 200 to 250 MG (614 to 767 AF) of demand reduction by 2035 from expanded water conservation. By generating 663 AFY in water savings, the project will enable the City to meet that goal. The proposed project may yield enough water savings benefits to enable SCWD to downsize or delay implementation of the other, more costly water supply augmentation elements, which include advanced treated water recycling, in-lieu water transfers, and aquifer storage and recovery (described below).

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<sup>20</sup> Source for population: City of Santa Cruz Water Department 2019 Annual Report. Source for active service connections: City of Santa Cruz 2020 Draft Urban Water Management Plan.

4. *Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?*

The crisis that the project will help to avert is water shortage due to drought. Besides the challenges associated with water rationing and economic loss associated with drought, there is little tension or litigation over water in the basin per se.

## **Evaluation Criterion E – Planning and Implementation**

### **1. Subcriterion E.1 – Project Planning**

a. *Identify any district-wide, or system-wide, planning that provides support for the proposed project.*

Strengthening water conservation efforts has been identified as a top priority by the Santa Cruz City Council, the City’s Water Commission, and by the City Council-appointed Water Supply Advisory Committee (WSAC). The WSAC was appointed by the City Council in 2013 to study the City’s water supply problem and come up with science/data-driven recommendations. The WSAC’s *Final Report on Agreements and Recommendations* (2015) recommends that the City implement additional demand management and supply augmentation projects to reliably make available an additional 1.2 billion gallons/year (3,683 AFY) during modeled worst-year conditions.<sup>21</sup> The recommended Water Supply Augmentation Strategy includes four elements:

- Element 0: Demand Management establishes a goal to generate an additional 200 to 250 million gallons (614 to 767 acre-feet) of demand reduction by 2035 from expanded water conservation.
- Element 1: In-Lieu Water Transfers includes storage of available San Lorenzo River flows during the rainy season in regional aquifers via in-lieu water transfers with neighboring water districts (i.e., passive groundwater recharge).
- Element 2: Aquifer Storage and Recovery establishes a program to inject treated water from available winter flows into regional aquifers and recover a large portion of the stored water as a supplemental supply for Santa Cruz.
- Element 3: Advanced Treated Recycled Water is intended to supplement or replace Elements 1 and 2 to the extent they do not generate sufficient yield to fill the supply/demand gap in a cost-effective and timely manner.<sup>22</sup>

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<sup>21</sup> City of Santa Cruz Water Supply Advisory Committee Final Report on Agreements and Recommendations, October 2015.

<sup>22</sup> City of Santa Cruz Water Supply Advisory Committee Final Report, October 2015.

Demand management, as reflected in the designation “Element 0,” is the foundational element of the City’s Water Supply Augmentation Strategy. The proposed AMI project will implement this strategy and enable the City to address the goal of achieving an additional 200 to 250 million gallons (614 to 767 acre-feet) of demand reduction by 2035.

The WSAC’s 2015 *Final Report on Agreements and Recommendations* is available at: <http://www.santacruzwatersupply.com/meeting/wsac-final-reportrecommendation-appendices>

- b. Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).*

In addition to supporting the demand management goals of the City’s Water Supply Augmentation Strategy, the proposed AMI meter installation project supports several existing plans and ongoing planning efforts. These include:

- *City of Santa Cruz Water Conservation Master Plan (2017)*
- *City of Santa Cruz Updated Interim Water Shortage Contingency Plan (2021)*
- *City of Santa Cruz Local Hazard Mitigation Plan Five Year Update 2018-2023*
- *City of Santa Cruz’s Climate Adaptation Plan Update 2018-2023*

SCWD self-certifies that these documents are in place. Note that all of these documents were developed with significant input from community members and diverse stakeholder groups.

**Water Conservation Master Plan:** In 2017, the City of Santa Cruz developed an update of its *Water Conservation Master Plan* with an eye toward achieving the Water Supply Augmentation Strategy demand management goals. The plan includes a Recommended Program consisting of 35 individual water conservation measures to be implemented over the upcoming years. Of those 35 water conservation measures, AMI meter replacement ranked highest in water savings potential (in distant second place was high efficiency clothes washers), and ranked second overall as a recommended approach (behind “System Water Loss Reduction,” a system-wide water loss audit and control program). This plan can be accessed at: <https://www.cityofsantacruz.com/home/showdocument?id=58962>

**Water Shortage Contingency Plan:** Because the City has few short-term options for increasing the supply of water, the focus of the *Updated Interim Water Shortage Contingency Plan (2021)* is on measures that reduce water demand. The 2020 plan outlines a stringent water rationing schedule based on the five deficit conditions (Stages 1 - 5). At Stage 4, the 2021 plan requires single-family residential customers to reduce their water usage to just 25 gpcd. System-wide AMI meter installation is considered by SCWD staff to be critical for implementing the *Water*

*Shortage Contingency Plan.* The new AMI meters and software system will enable staff to alert customers before they have reached their allotments, and the web portal will enable customers to track their water usage to avoid hefty penalties. This plan can be accessed at: <https://www.cityofsantacruz.com/home/showpublisheddocument/83118/637481196432200000>

**Local Hazard Mitigation Plan Five Year Update 2018 – 2035:** The City Council-approved *Local Hazard Mitigation Plan Five Year Update 2018 - 2035* summarizes the “drought” hazard as follows: “The City water service area is a physically and geographically isolated, self-reliant system. ...The system relies entirely on rainfall, surface runoff, and groundwater infiltration occurring within the watersheds located within Santa Cruz County. Due to its isolation and reliance on surface water supplies, the City is highly vulnerable to shortage in drought years when the San Lorenzo River and coast sources run low.”<sup>23</sup>

The plan’s Drought Goals include:

1. Reduce water demand in all years through water conservation
2. Cut back water demand temporarily in drought years
3. Increase water supply

Drought Mitigation Actions include:

A-11 Additional water conservation to maximize the efficient use of existing water resources.

The proposed AMI project supports these goals and mitigation action by conserving an estimated 663 AFY and contributing to increased water supplies. The *Local Hazard Mitigation Plan Five Year Update (2018-2023)* is accessible at:

<https://www.cityofsantacruz.com/home/showdocument?id=77162>

**Climate Adaptation Plan Update 2018 – 2035:** The City’s *Climate Adaptation Plan Update 2018 - 2035* references the City’s Water Supply Augmentation Strategy and prioritizes the following climate adaptation strategies as “very high priority”:<sup>24</sup>

- A-16 Improve water supply reliability
- A-18 Conserve and curtail water usage
- A-22 Prepare for short-term water shortage and water emergency supply for climate related events

The proposed AMI project directly addresses these strategies as described previously. The plan is accessible at: <https://www.cityofsantacruz.com/home/showdocument?id=73396>

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<sup>23</sup> City of Santa Cruz Local Hazard Mitigation Plan Five Year Update 2018-2035, p. 90.

<sup>24</sup> City of Santa Cruz Climate Adaptation Plan Update 2018-2035, p. 75.



- c. *If applicable, provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed WaterSMART Basin Study or Water Management Options Pilot.*

The project does not address an adaptation strategy identified in a completed WaterSMART Basin Study or Water Management Options Pilot.

## **2. Subcriterion E.2 – Readiness to Proceed**

This section summarizes the major tasks and project schedule for the proposed AMI meter installation project. No new policies will be required to implement the project per se; however, organizational and management changes with regard to SCWD staff roles, billing procedures, and other process changes to adapt to and optimize the new AMI system will be required in order to achieve the intended water conservation goals. The Implementation Management task (Task 4) will provide oversight and guidance for these structural changes as needed.

### **Summary Description of Major Tasks**

#### **Task 1. Grant Administration**

The lead agency for this project is the Santa Cruz Water Department. Task 1 includes all activities related to grant administration, including execution of the grant agreement, quarterly invoicing to Reclamation, reporting (including financial reports, semi-annual Interim Performance Report, and the Final Performance Report), and other requirements as outlined in the grant agreement.

We assume an official project start date of July 1, 2022 and project end date of March 31, 2023. Based upon a conversation with US Bureau of Reclamation staff in the South-Central California Area district office,<sup>25</sup> the NEPA process for a straightforward AMI replacement project such as the one proposed is estimated to take between one and three months (potentially up to six months). With anticipated award notification in March 2022, we therefore expect to have NEPA clearance by June 1, 2022. We anticipate having the Grant Agreement signed by July 1, 2022. AMI installation under this project will begin with cost share funds as soon as NEPA clearance is granted (assuming June 1, 2022). Installation activities will end in December 2022. Three months have been added to the schedule for final reporting, invoicing, and grant close out following completion of AMI installation. The project will conclude by March 31, 2023.

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<sup>25</sup> Phone conversation on October 22, 2021 with Rain Emerson, Environmental Compliance Branch Chief, Bureau of Reclamation, South-Central California Area Office.

## **Task 2. Purchase Supplies and Materials**

SCWD will purchase AMI Badger meters, Badger ORION radios, and other appurtenances directly from Badger Meter in December 2021 and January 2022. SCWD will purchase Nicor meter box lids separately during the same time period. We expect all essential supplies to be purchased by the end of January 2022.

## **Task 3. AMI Meter Installation**

As described previously, AMI meter installation will be performed by UPA. The actual AMI replacement is expected to take 12 months, beginning in January 2022. However much of the installation that occurs prior to NEPA clearance (including mobilization and the “slow start”) will not be considered part of the proposed project. The proposed project will represent a “Phase II” of the AMI replacement effort, picking up on the installation process at whatever point “Phase I” leaves off. Any installation that occurs prior to the executed Grant Agreement but after NEPA clearance will be covered by local cost share.

We anticipate that AMI meter installation will begin as part of this project with cost share on June 1, 2022, and then with grant funding beginning July 1, 2022, with completion and final system acceptance by December 31, 2022.

## **Task 4. Implementation Management**

As described previously, implementation management will be performed by Jacobs Engineering. Implementation management involves oversight of all parties involved, contract management, and general coordination to ensure the successful deployment of an end-to-end solution. Integration is also included in this task, referring broadly to integration of the Badger AMA meter data management system software and WaterSmart customer portal software with SCWD’s billing and reporting system, organizational change management including ensuring that SCWD staff understand the new processes involved with AMI and their new roles, workflow and communication verification, and guiding the organizational re-structuring necessary to achieve the intended water conservation goals. This task also includes training SCWD staff to use/understand the new AMI software platform.

The schedule for project management and integration coincides with Task 3, AMI Meter Installation, providing one additional month for final inventory reconciliation and installation close out.

## Schedule

Table 4 displays the schedule as described above, with all activities prior to the Executed Grant Agreement shaded a lighter blue. Milestones are summarized below the table.

**Table 4. Project Schedule**

	Q4 2021			Q1 2022			Q2 2022			Q3 2022			Q4 2022			Q1 2023		
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Task 1. Grant Administration						award			NEPA clearance	Grant Agreement								Final Report
Task 2. Purchase AMI Supplies																		
Task 3. Meter Installation															ramp down			
Task 4. Implementation Mgmt																close out		

### Task 1 milestones:

- NEPA clearance by June 1, 2022
- Executed Grant Agreement by July 1, 2022
- Quarterly invoices
- Semi-annual SF-425 Federal Financial Report and Interim Performance Report submitted in January 2023 (if required)
- Final Performance Report submitted by March 31, 2023

### Task 2 Milestones:

- All supplies and materials procured by January 31, 2022

### Task 3 Milestones:

- All meters installed by December 31, 2022

### Task 4 Milestones:

- Final system acceptance by December 31, 2022
- AMI installation close out by January 31, 2023

## Evaluation Criterion F – Collaboration

### *1. Describe how the project promotes and encourages collaboration.*

- a. Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?*

There is widespread community support for water conservation generally in Santa Cruz, as demonstrated by the fact that the City has one of the lowest per capita water consumption rates in the state of California. There is strong support for the AMI replacement project, specifically, from the Water Commission and City Council. Most neighboring water agencies are also implementing AMI metering and are supportive of the City's project in the interest of improving regional water supply reliability. Please see letters of support from the Soquel Creek Water District and Scotts Valley Water District in Appendix A.

- b. What is the significance of the collaboration/support?*

Strong support from the City of Santa Cruz, Water Commission, City Council, and SCWD customers for projects that reduce water demand and produce water savings helps justify, and lends support to, SCWD's investment in AMI metering.

In addition, there is notable benefit when water agencies within a single region, such as north Santa Cruz County, approach water conservation in similar ways. By implementing similar programs and policies, agencies can leverage common messaging to increase community awareness about local water management and help shift customer behavior to make beneficial practices commonplace (such as encouraging customers to utilize the AMI web portal). Also, to the extent conjunctive use projects are explored in the future and implemented on a regional basis, developing a common model of metering and water conservation is beneficial.

- c. Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*

The project will greatly increase the likelihood of future water conservation improvements by SCWD water users. A key aspect of AMI technology is the customer web portal. Residents in the Santa Cruz region are engaged and motivated to conserve water, but what they lack with the current once-a-month billing structure is information. The web portal, powered by Badger BEACON AMA cloud-based software, gives customers the ability to monitor and manage their water use by providing water consumption data in 15-minute, hourly, daily, monthly and yearly intervals. The portal will provide a powerful new tool that will enable customers to better understand their water usage behavior and modify accordingly.

## Evaluation Criterion G – Additional Non-Federal Funding

The percentage of non-Federal funding is 92 percent:

$$\$5,929,287 / \$6,429,287 = 92 \text{ percent}$$

## Evaluation Criterion H – Nexus to Reclamation

The proposed project has indirect nexus with a Reclamation-funded 2018 pilot study conducted by the Soquel Creek Water District in collaboration with the City of Santa Cruz. Reclamation provided \$150,000 in Title XVI Recycled Water Feasibility Planning Grant funds for a pilot study to evaluate tertiary treatment technology as part of the District's Pure Water Soquel Project. The small-scale tertiary treatment pilot plant is located on-site at the City of Santa Cruz Wastewater Treatment Facility.

The proposed full-scale Pure Water Soquel Project involves potentially recycling 25 percent of the secondary treated effluent that is currently being discharged from the Santa Cruz Wastewater Treatment Facility, purifying it, and then using the purified water to replenish the Santa Cruz Mid-County groundwater basin and to create a seawater barrier. The City of Santa Cruz draws its groundwater supply from the Santa Cruz Mid-County basin. The proposed AMI installation project has nexus with the Reclamation-funded pilot project to the extent that both projects are part of the City's effort to improve resiliency and reliability of water supplies for the City of Santa Cruz.

The applicant does not have a water service, repayment, or O&M contract with Reclamation. The applicant does not receive Reclamation water through a Reclamation contractor or by any other contractual means. To our knowledge, the proposed work will not benefit a Reclamation project area or activity. The applicant is not a Tribe.

## 5. Performance Measures

The performance measure that will be used to quantify actual benefits upon completion of the project is water saved. Water savings that result from the proposed AMI project will be verified according to a monitoring plan. While the water savings benefit may not be evident immediately upon completion of the project, monitoring will continue for two years post-installation in order to quantify water savings.

A total of 23,905 meters will be replaced over the course of the entire AMI replacement effort. A randomized sample of 200 single-family residential accounts will be selected. The sample size is based on the following. The total number of single-family and two-unit accounts in the service area is approximately 21,890, according to the *Santa Cruz Water Department Annual Report*

2019. If a 95 percent confidence level is used, with a population of 21,890, and 7 percent margin of error, the sample size would be 194.

The water use history for each of these 200 accounts will be produced, noting the date they received a new AMI meter. Water consumption and leak activity for the accounts will be carefully tracked over time, with measurements taken at 6 months, 1 year, and 2 years post-installation of the new meter. As closely as possible, these periodic snapshots in time of the water consumption on the selected accounts will correspond to the timing of a public outreach campaign to increase user enrollment with the AMI customer portal, or with a new policy (such as leak forgiveness – see information below) that encourages enrollment in the portal. In this way we will be monitoring the influence of these campaigns and policies on the portal participation and overall water savings.

Leak data will include the leak start date, end date, and total volume attributed to the leak. At the end of the monitoring period, SCWD will have the full consumption history for each account. That data can be analyzed in a number of ways to quantify the actual change in water usage as well as customer responsiveness to leaks, and whether those leaks were detected by the customer using the online web portal or whether the customer was notified of the leak by SCWD.

Not all decreases in water consumption will necessarily be attributable to AMI, though SCWD will assume that most of the reduced consumption observed will be attributable to AMI. It should be noted that SCWD's billing structure will not change post-installation of AMI meters, therefore, any changes in customer behavior (either increased conservation or increased responsiveness to leaks) will not be attributable to different billing incentives.

SCWD *will* alter its Leak Forgiveness program once AMI is fully deployed. SCWD is considering accepting and processing a leak forgiveness only on the condition that the customer sign up for leak alerts in the future (to incentivize subscription to the web portal). SCWD may also opt to eliminate the Leak Forgiveness program altogether, which could serve to motivate customers to become more proactive about recognizing and addressing leaks themselves. SCWD will need to determine the extent to which changes in the Leak Forgiveness program might be considered part and parcel of AMI benefits, and how that – and other factors – may affect assumptions in the monitoring plan.

## Section II. Project Budget

### 1. Funding Plan

The City of Santa Cruz is requesting \$500,000 in Federal grant funds, and will contribute a non-Federal cost share of \$5,929,290, for a total project cost of \$6,429,290. The cost share will be provided entirely by City of Santa Cruz Water Department Enterprise Funds. The Department operates financially as an enterprise in which all the costs of running the system are paid by water rates, service charges, and related revenues. The Water Fund receives no tax or general fund revenues. SCWD will contribute \$7,265 in staff time (in-kind costs), and will provide a monetary contribution of \$5,922,025 toward supplies and contractual costs. All match is secure.

We anticipate an award announcement date sometime in March 2022 and an Executed Grant Agreement by July 1, 2022. Project costs that will have been incurred prior to award include:

- **AMI Materials Procurement:** \$3,666,594. This includes purchase of AMI meters, endpoints, and meter box lids that will be used for AMI replacement for 15,050 meters during the project period, June 1 - December 31, 2022. SCWD expects to purchase all supplies during the months of December 2021 and January 2022.
- **AMI Installation:** \$317,823. This represents one month of AMI installation performed by UPA during the month of June 2022 – after NEPA clearance has been granted but prior to the July 1, 2022 Executed Grant Agreement.
- **Implementation Management:** \$66,333. This represents one month of Jacobs Engineering’s implementation management activities during the month of June 2022 – after NEPA clearance has been granted but prior to the July 1, 2022 Executed Grant Agreement.

All costs incurred prior to award will be paid entirely by the City of Santa Cruz as non-Federal cost share.

### 2. Budget Proposal

Table 5 shows the total project budget broken out by requested Reclamation funds and non-Federal cost share. As noted above, the non-Federal cost share will be provided entirely by the City of Santa Cruz. Table 6 shows the project budget by budget item and unit cost.

**Table 5. Total Project Cost Table**

Funding Source	Amount
Requested Reclamation Funding	\$500,000
Non-Federal Costs to be Paid by Applicant (City of Santa Cruz)	\$5,929,290
<b>Total</b>	<b>\$6,429,290</b>

**Table 6. Budget Proposal**

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	\$/UNIT	QUANTITY		
<b>Salaries and Wages</b>				
Project Manager Kyle Petersen	\$69.79	4	hours	\$279
Management Analyst	\$49.84	102	hours	\$5,084
<b>Total Salaries and Wages</b>				<b>\$5,363</b>
<b>Fringe Benefits</b>				
Project Manager Kyle Petersen	\$38.58	4	hours	\$154
Management Analyst	\$17.14	102	hours	\$1,748
<b>Total Fringe Benefits</b>				<b>\$1,902</b>
<b>Materials and Supplies</b>				
AMI meters (5/8")	\$118.00	15,050	units	\$1,775,900
Radio endpoints	\$77.50	15,050	units	\$1,166,375
Lids	\$27.50	15,050	units	\$413,875
<i>Subtotal Supplies</i>				<i>\$3,356,150</i>
Tax 9.25%				\$310,444
<b>Total Materials and Supplies</b>				<b>\$3,666,594</b>
<b>Contractual/Construction</b>				
<b>1. AMI Meter Installation Services: Utility Partners of America (UPA)</b>				
Installation (based on 5/8" meters)	\$85.71	15,050	units	\$1,289,936
Project Management			per contract	\$448,933
Configuration of Work Order Management System			per contract	\$5,833
Printing and Postage			per contract	\$37,448
Warehousing and Office Space			per contract	\$240,363
<i>Subtotal</i>				<i>\$2,022,513</i>
10% contingency				\$202,251
<b>Total UPA</b>				<b>\$2,224,764</b>



<b>2. Project Management: Jacobs Engineering</b>				
Salaries and Wages*				
Program Director Jaason Englesmith	\$292.50	289	hours	\$84,552
Program Manager	\$247.50	365	hours	\$90,420
Implementation Advisor	\$198.00	148	hours	\$29,357
Transformation Lead	\$198.00	204	hours	\$40,445
Deputy Program Manager	\$157.50	899	hours	\$141,624
Data Intelligence	\$135.00	583	hours	\$78,697
Field Coordinator	\$85.50	418	hours	\$35,705
Subtotal Salaries and Wages				\$500,800
Travel			per contract	\$29,867
<b>Total Jacobs</b>				<b>\$530,667</b>
<b>Total Contractual/Construction</b>				<b>\$2,755,431</b>
<b>TOTAL ESTIMATED PROJECT COSTS</b>				<b>\$6,429,290</b>

\* Discrepancies in costs for staff salaries/wages are due to rounding errors.

### 3. Budget Narrative

#### Personnel

Salaries and wages and fringe benefits for SCWD staff total \$7,265. This amount, all of which is for grant administration, will be contributed by SCWD as in-kind cost share.

The Project Manager for the proposed project is Kyle Petersen, SCWD Customer Service Manager. Mr. Petersen will spend an estimated 4 hours at a benefited rate of \$108.37/hour reviewing the Semi-Annual Report and Final Report, for a total of \$433. The rate includes a base rate of \$69.79/hour and a fringe benefit rate of \$38.58/hour.

The Management Analyst will work a total of 102 hours: 40 hours with Reclamation on NEPA clearance and executing the Grant Agreement; 32 hours on invoicing and document management (4 hours x 8 months); and 30 hours developing one Semi-Annual report and the Final Project Report. At a benefited rate of \$66.98/hour, the total amount is \$6,832. The rate includes a base rate of \$49.84/hour and a fringe benefit rate of \$17.14/hour.

The City of Santa Cruz calculates fringe benefits at different rates depending on the length of time an employee has been employed by the City along with several other factors, including options provided to the employee with respect to health care, retirement contributions, and allowances. Fringe benefits include: insurance benefits (health, vision, dental, Medicare, unemployment, group life insurance, state disability insurance), retirement contributions,

workers' compensation, vehicle-phone-data allowance, employment assistance program, and PERS unfunded liability.

## **Materials and Supplies**

The budget includes a total of \$3,666,594 for Materials and Supplies. This entire amount will be contributed by SCWD as a monetary cost contribution.

SCWD is scheduled to purchase AMI meters and radio endpoints directly from Badger Meter, Inc. in December 2021 and January 2022 (Appendix C). Unit costs for meters and endpoints are based on the price list included in the Agreement, dated October 5, 2021. Since the exact quantities of different size meters to be installed during the project period is unknown at this time, for the purposes of the budget we have based the meter cost on the least-cost meter, 5/8" x 3/4", at a unit cost of \$118/meter. The cost for 15,050 meters, then, is \$1,775,900. Radio endpoints cost \$77.50 each, therefore the total cost for 15,050 endpoints is \$1,166,375. SCWD will purchase Nicor meter box lids separately. The cost for lids is estimated at \$27.50 per lid based on recent experience, totaling \$413,875 for lids. A tax of 9.25% is applied to the subtotal.

## **Contractual**

Two contractors have been hired to implement and manage the project: Utility Partners of America LLC (UPA) will be responsible for AMI meter installation, and Jacobs Engineering Group, Inc. will provide implementation management. Both contractors have been hired using a competitive bid process. Selection was based on technical scores, the results of in-depth interviews, and pricing to determine the best value contractor.

### ***Utility Partners of America LLC – AMI Installation***

The total cost for UPA for AMI meter installation is estimated at \$2,224,764. SCWD is requesting \$500,000 in Federal grant funds toward this cost.

UPA bases their costs on a per meter installation fee, plus project management, configuration of Work Order Management System (WOMS), printing and postage, warehousing and office space, and a 10 percent contingency (see contract dated October 11, 2021, Appendix D). AMI meter installation is scheduled to begin January 3, 2022 and run through the end of December 2022. Since the proposed project budget (including cost-share) begins June 1, 2022, the cost for UPA's installation services is proportional. For purposes of this budget, the AMI installation cost assumes 15,050 meters based on the 5/8" meter size; actual costs may be higher, depending on the sizes of meters installed. All other UPA costs are proportional to the amount of time UPA

will be spending between June 1 – December 31, 2022. UPA’s costs are further described as follows.

AMI Meter Installation: Meter installation consists of providing all labor, tools and non-City supplied equipment required to excavate (if necessary) and replace an existing water meter of specified size with a new Badger E-Series water meter, gaskets or washers (as appropriate); Badger Orion Endpoint Meter Interface Unit; and Nicor meter box lid. The cost for installation of 5/8” meters is \$85.71/meter.

Project Management: Lump sum unit cost of \$769,599 for project management consists of any and all work and operations to manage the AMI meter replacement project including: all communications with SCWD staff and its assigns and customers; the recruitment, training and management of UPA’s staff associated with the meter replacement project; inventory management; materials disposal; traffic control; inspections; quality assurance; documentation; project accounting; and any other required activities and expenses not otherwise covered. The proportional cost from June 1 – December 31, 2022 is:  $\$769,599 \div 12 \text{ months} = \$64,133/\text{month} \times 7 \text{ months} = \$448,933$ .

Configuration of Work Order Management System (WOMS): Lump sum unit cost of \$10,000 consists of all labor, software, hardware and data management needs to acquire, design, configure and test the chosen WOMS such that all required data can be passed, reliably, consistently and without error between SCWD and UPA as needed for successful meter replacement project fulfilment. The proportional cost from June 1 – December 31, 2022 is:  $\$10,000 \div 12 \text{ months} = \$833/\text{month} \times 7 \text{ months} = \$5,833$ .

Printing and Postage: Lump sum unit cost of \$64,197 consists of all labor and expenses associated with the development, publishing, printing, and distribution of hard-copy materials including: door hangers, letters, brochures, identification items, manuals, maps, training materials and any and all other such items produced by UPA for the AMI meter replacement project. The proportional cost from June 1 – December 31, 2022 is:  $\$64,197 \div 12 \text{ months} = \$5,350/\text{month} \times 7 \text{ months} = \$37,448$

Warehousing and Office Space: Lump sum unit cost of \$412,050 consists of labor and expenses to locate, secure and mobilize to and from facilities necessary to: warehouse materials, provide off-street overnight parking of vehicles and provide UPA office space and any and all facilities required for the AMI meter replacement project. The proportional cost from June 1 – December 31, 2022 is:  $\$412,050 \div 12 \text{ months} = \$34,338/\text{month} \times 7 \text{ months} = \$240,363$ .

Contingency: A 10 percent contingency is added: Subtotal of  $\$2,022,512 \times 10\% = 202,251$ .

### ***Jacobs Engineering Inc – Implementation Management:***

The total cost for Jacobs Engineering for implementation management is \$530,667. SCWD will contribute this entire amount as local cost-share.

SCWD signed an Agreement with Jacobs Engineering, Inc. on June 16, 2021 for implementation management services at a total cost of \$994,997 (Appendix E). The Notice to Proceed date is November 1, 2021 and Project Close Out date is January 30, 2023, totaling 15 months. Since the proposed project budget (including cost-share) begins June 1, 2022, the cost for Jacobs Engineering’s implementation management services is proportional, based on their services performed from June 1, 2022 to January 30, 2023 (8 months).

Salaries and Wages: Personnel costs total \$500,800. The cost estimates for personnel include fringe benefits, and are based on the hourly rates stated in the Jacobs Engineering Agreement and the proportion of staff hours anticipated for the work period June 1, 2022 – January 30, 2023 (8 months). These costs are detailed in the Budget Proposal Table above.

Travel: Travel costs are included in the Professional Services Agreement to cover Jacobs Engineering staff travel to/from Santa Cruz and lodging/meals while staying in Santa Cruz for work related to the implementation management services. The project budget assumes a travel cost proportionate to the work period June 1, 2022 – January 30, 2023 (8 months): Total travel budgeted  $\$56,000 \div 15 \text{ months} \times 8 \text{ months} = \$29,867$ .

### **Environmental and Regulatory Compliance Costs**

There is no cost allocated for environmental and regulatory compliance at this time. CEQA compliance was completed for the AMI project in August 2020, and no permits are required. SCWD recognizes that if environmental or cultural resources compliance for NEPA requires significant participation by Reclamation, costs anticipated to be incurred by Reclamation will be added as a line item to the budget during development of the financial assistance agreement and cost shared accordingly.

## Section III. Environmental and Cultural Resources Compliance

SCWD does not expect environmental compliance to be complicated since the proposed meter replacement project replaces existing infrastructure only and will not cause any significant disturbance to the environment or to cultural resources.

- 1. 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 that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.*

The proposed project is replacing existing infrastructure in a built environment. There is no expectation for any impacts.

- 2. 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?*

The proposed project will take place in a built environment. SCWD is not 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.

- 3. Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States?” If so, please describe and estimate any impacts the proposed project may have.*

There are surface waters within the boundary of the SCWD service area, but no wetlands or other surface waters within the footprint of project activities (i.e., in the vicinity of where meters will be replaced). There will be no impacts to Waters of the United States.

- 4. When was the water delivery system constructed?*

The City of Santa Cruz Water Department was formed circa 1916, although portions of the water system date back to the late 1800s. These early features include diversions from three coastal streams and a natural spring located approximately six to eight miles northwest of the City: Laguna Creek, Majors Creek, and Liddell Spring. The majority of large infrastructure investment by SCWD occurred in the 1960s and included Newell Creek Dam (which formed Loch Lomond), Newell Creek Pipeline, Felton Booster Pump Station, Graham Hill Water Treatment Plant. The Live Oak Well system, consisting of four groundwater production wells and two

water treatment plants, was purchased from the Beltz Water Company in 1964. This was followed almost immediately in the 1970s by the Felton Diversion and Pump Station, and San Lorenzo Diversion.

- 5. Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? 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.*

The proposed project will not result in any modification of or effects to individual features of an irrigation system.

- 6. 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.*

The proposed project will have no impacts on any buildings, structures, or features listed or eligible for listing on the National Register of Historic Places.

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

There are no known archaeological sites in the proposed project area.

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

The proposed project will have no adverse effect on low income or minority populations.

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

The proposed project will not limit access to, or ceremonial use of, Indian sacred sites or result in other impacts on Tribal lands.

- 10. 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?*

The proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

## **Section IV. Required Permits or Approvals**

No additional permits or approvals will be required for this project.

## **Section V. Letters of Support**

Letters of support for the proposed project are attached from the following agencies and organizations in Appendix A:

1. City of Santa Cruz City Manager's Office: Rosemary Menard, Interim City Manager
2. City of Santa Cruz Water Department: Heidi Luckenbach, Acting Water Director
3. City of Santa Cruz City Manager's Office: Dr. Tiffany Wise-West, Sustainability & Climate Action Manager
4. City of Santa Cruz Water Commission: Walt Wadlow, Vice Chair
5. County of Santa Cruz Environmental Health: Sierra Ryan, Water Resources Division Director
6. Soquel Creek Water District: Ron Duncan, General Manager
7. Scotts Valley Water District: Bill Ekwall, Board President, and Piret Harmon, General Manager
8. City of Sacramento Department of Utilities: William E. Granger, Water Conservation Coordinator
9. Amah Mutsun Tribal Band: Valentin Lopez, Tribal Chairman
10. Coastal Watershed Council: Laurie Egan, Programs Director
11. Regional Water Management Foundation: Tim Carson, Program Director
12. California Assembly 29<sup>th</sup> District: Assemblymember Mark Stone
13. US House of Representatives 20<sup>th</sup> District, California: Congressman Jimmy Panetta

## **Section VI. Official Resolution**

Submittal of this grant application for WaterSMART Water and Energy Efficiency grant funds was approved by resolution of the City Council (Resolution No. NS-29,883) adopted on October 26, 2021. The resolution is attached immediately below.

RESOLUTION NO. NS-29,883

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SANTA CRUZ AUTHORIZING THE WATER DEPARTMENT TO APPLY FOR BUREAU OF RECLAMATION FUNDS FOR A METER REPLACEMENT PROJECT

WHEREAS, the City of Santa Cruz (the "CITY") desires and intends to finance expenditures to implement a system-wide meter replacement program (Project); and

WHEREAS, the CITY expects to apply for a grant from the U.S. Department of the Interior, Bureau of Reclamation Funding Opportunity Number R22AS00023 for the Project; and

WHEREAS, the Water Director or designee is hereby authorized (the "Authorized Representative"), to enter into an agreement under this Notice of Funding Opportunity (NOFO); and

WHEREAS, the Authorized Representative, or designee, has reviewed and supports the grant application submitted under this NOFO, and is designated to represent the CITY in carrying out the CITY's responsibilities under the grant agreement, including certifying disbursement requests on behalf of the CITY, and compliance with applicable state and federal laws; and

WHEREAS, the Water Department has the capability to provide the amount of funding and/or in-kind contributions specified in the funding plan; and

WHEREAS, the CITY will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.

NOW THEREFORE, BE IT RESOLVED that the City Council of the City of Santa Cruz supports submittal of a grant application to the U.S. Department of the Interior Bureau of Reclamation and approves this Authorizing Resolution as required in the NOFO.

PASSED AND ADOPTED this 26<sup>th</sup> day of October, 2021, by the following vote:

AYES: Councilmembers Watkins, Kalantari-Johnson, Brown, Cummings, Golder; Vice Mayor Brunner; Mayor Meyers.

NOES: None.

ABSENT: None.

DISQUALIFIED: None.

APPROVED: \_\_\_\_\_

  
Donna Meyers, Mayor

ATTEST: \_\_\_\_\_

  
Bonnie Bush, City Clerk Administrator