City of Bakersfield

Proposal for Water and Energy Efficiency Grant (WEEG)

Bakersfield Advanced Metering Infrastructure (AMI) Project

Submitted: July 28th, 2022

City of Bakersfield Water Resources Department
1000 Buena Vista Rd
Bakersfield, CA 93311

Samuel Blue
Phone: (661) 326-3715
Email: sblue@bakersfieldcity.us
1000 Buena Vista Rd, Bakersfield, CA 93311

Table of Contents

Project Abstract

- The purpose of the project
- The activities to be performed
- The expected deliverables or outcomes
- The intended beneficiaries
- Any subrecipient activities, if known

The City of Bakersfield Advanced Metering Infrastructure (AMI) Project will improve the efficiency of Bakersfield's municipal water system and support long-term resiliency to drought and climate change by installing 5,500 AMI meters. This project will kickstart a long-term initiative to convert the entire system to AMI. Project activities will include the procurement and installation of AMI meters in a project area that is predominantly residential with over 20,000 residents. It is estimated that this project will result in water savings of 221.1 acre-feet per year by reducing system losses and greenhouse gas reductions of 4.3 metric tons of CO2 per year by reducing vehicle miles traveled and increasing the energy efficiency of the water system. The intended beneficiaries of this project are the residents of the City of Bakersfield and surrounding areas that will benefit from improved water conservation efforts that result in increased water supply for the region. Meter installation will be carried out by California Water Service (Cal Water) through the existing operations and maintenance contract for the City of Bakersfield's municipal water system.

Executive Summary

- The date, applicant name, city, county, and state
- Indicate whether you are a Category A applicant or a Category B applicant. If you are a Category B applicant, please briefly explain how you are acting in partnership with a Category A partner. Note: If you are a Category B applicant, you must include a letter from the Category A partner confirming that they are partnering with you and agree to the submittal and content of the proposal. See Section C.1. Eligible Applicants.
- A one-paragraph project summary that provides:
    - the location of the project
    - a brief description of the work that will be carried out
    - any partners involved
    - expected benefits
    - how those benefits relate to the water management issues you plan to address
    - The length of time and estimated completion date for the proposed project. Note: proposed projects should not have an estimated construction start date that is prior to May 2023.
    - Whether or not the proposed project is located on a Federal facility.

Date: July 28, 2022
Applicant: City of Bakersfield
County: Kern County
State: California
Category: A
Funding Group: I
Funding Request: $499,829.05
Completion Date: 5/30/2025
Located on Federal Facility: No

The City of Bakersfield proposes to install 5,500 Advanced Metering Infrastructure (AMI) meters in a residential area that includes over 20,000 residents. The city will partner with California Water Service (Cal Water), which holds the operations and maintenance contract for Bakersfield's municipal water system. It is estimated that this project will result in water savings of 221.1 acre-feet per year by reducing system losses and greenhouse gas reductions of 4.3 metric tons of CO2 per year by reducing vehicle miles traveled and increasing the energy efficiency of the water system. These benefits will support efforts to combat drought by conserving water and demonstrating the efficacy of AMI in Bakersfield, paving the way for long-term plans to convert the entire municipal water system to use AMI. It is estimated that the project will be completed no later than May 2025, with meter procurement beginning in June 2023 and installation occurring on a rolling basis as meters are received.

Project Location

- Provide detailed information on the proposed project location or project area including a map showing the specific geographic location.
    - For example, {project name}is located in {state and county} approximately {distance} miles {direction, e.g., northeast} of {nearest town}. The project latitude is {##°##'N} and longitude is {###°##'W}.

The City of Bakersfield Advanced Metering Infrastructure Project is located in Bakersfield, a large municipality with 403,455 residents located in Kern County, CA. Bakersfield is located in the San Joaquin Valley, approximately 87 miles northeast of Lancaster, CA and 109 miles south of Fresno, CA. The project location encompasses the majority of the area from 35.339529°, -119.091988° to 35.318242°, -119.056972°.

Figure 1. Project Location Map

This area was prioritized by the Water Resources Department because the majority of meters in this area are at or near their 20 year life cycle. Many of the meters are either stuck or are underreporting water usage.

Based on the most recent Census Tract-level data available, this project would impact over 20,000 residents in the City of Bakersfield.

Technical Project Description

- Provide a more comprehensive description of the technical aspects of your project, including the work to be accomplished and the approach to complete the work. This description should provide detailed information about the project including materials and equipment and the work to be conducted to complete the project. This section provides an opportunity for the applicant to provide a clear description of the technical nature of the project and to address any aspect of the project that reviewers may need additional information to understand.

The City of Bakersfield plans to install 5,500 Advanced Metering Infrastructure (AMI) meters, which would be the City's flagship project to kickstart long-term efforts to adopt AMI to increase the efficiency of the municipal water system. AMI results in increased system efficiency by improving the consumer's ability to monitor their own water use and strengthening the disincentives created by tiered usage pricing systems. This is done by installing the end-use meters, which connect to a data sharing system, and providing a digital AMI Portal that gives consumers direct access to their usage data in near real-time. AMI portals also allow customers to enable leak alerts and high-usage alerts to support conservation efforts.

California Water Service (Cal Water) operates the City of Bakersfield's water system through an operations and maintenance contract. This contract is managed by the City's Water Resources Department, with the oversight of the City Council. Cal Water's Bakersfield District was formed in 1926 with the purchase of Bakersfield Water Works. Residents receive water from a combination of local groundwater produced by 51 active wells (treated where necessary to improve taste and odor), surface water from the Kern River (treated with highly advanced membrane filtration), and treated water purchased from the Kern County Water Agency. The AMI meters will interface with Cal Water's existing system to ease integration.

Evaluation Criteria #1: Quantifiable Water Savings

- Describe the amount of estimated water savings. For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please include a specific quantifiable water savings estimate; do not include a range of potential water savings.

In 2020, the City of Bakersfield's residential water use was 29,985.4 acre-feet. The City's water system had 44,731 residential meters, with a calculated use residential meter of 0.67 acre-feet per meter. This project will install 5,500 AMI Replacement Meters. The City of Bakersfield currently implements a three tiered rate system for consumers with metered water connections, with water rates that were last updated in January 2022.[1] 100% of the city's service area is currently metered, but there have not been any previous efforts to install AMI meters.

Estimated water savings are based on the range cited in the American Water Works Association's (AWWA) AMI Guidebook for Practitioners. "Based on recent meta-analyses and systematic review, a credible range of water savings associated with AMI-based programs falls within a range of 2 to 10%."[2] The City anticipates water savings of 6% per AMI Meter installed, right in the middle of the range established by the meta-analysis.

[1] https://www.calwater.com/rates-and-tariffs/?dist=bk
[2] https://www.awwa.org/Portals/0/AWWA/ETS/Resources/Technical%20Reports/ami_guidebook_feb_2022.pdf

Under the current water system's infrastructure, it is estimated that the 5,500 meters to be replaced have an annual usage of 3,685 acre-feet. Installation of AMI, with an estimated 6% in savings, would generate an estimated water savings of 221.1 acre-feet per year.

- Describe current losses: Please explain where the water that will be conserved is currently going and how it is being used. Consider the following:
    - Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?

Based on results from the City of Bakersfield's annual water loss audit required by the State of California, the total system loss for 2020 is 3,028 acre-feet. Losses for the project area are calculated based on the average loss per system connection. In 2020, the system had a total of 48,140 connections with a loss per connection of 0.063 acre-feet. This results in an estimated loss for the project area of 345.95 acre-feet. Installation of AMI would prevent approximately 63.91% of system losses in the project area. Water losses exit the system as runoff into the street, drainage courses, and storm drain system and through infiltration into the adjacent ground.

- 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?

The current losses are not returning to the system for use by others.

- 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 where the current losses are going.

- Describe the support/documentation of estimated water savings: Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section
    - In addition, please note that the use of visual observations alone to calculate water savings, without additional documentation/data, are not sufficient to receive credit under this section. Further, the water savings must be the result of reducing or eliminating a current, ongoing loss, not the result of an expected future loss.

Documentation of estimated water savings and system losses are based on data collected by the City of Bakersfield Water Resources Department as part of the annual audit for 2020. To conduct

this audit, the City used the American Water Works Association's Free Water Audit Software. [3]

- Please address the following questions according to the type of infrastructure improvement you are proposing for funding (types below):
    - *Municipal Metering*: Municipal metering projects can provide water savings when individual user meters are installed where none exist to allow for unit or tiered pricing and when existing individual user meters are replaced with advanced metering infrastructure (AMI) meters. To receive credit for water savings for a municipal metering project, an applicant must provide a detailed description of the method used to estimate savings, including references to documented savings from similar previously implemented projects. Applicants proposing municipal metering projects should address the following:
        - 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.
        - How have current system losses and/or the potential for reductions in water use by individual users been determined?
        - 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.
        - What types (manufacturer and model) of devices will be installed and what quantity of each?
        - How will actual water savings be verified upon completion of the project?

The City of Bakersfield has not previously implemented any AMI meters as part of its water system. This project would be a flagship effort to launch the use of AMI in Bakersfield.

The City of Bakersfield will install 5,500 Badger Meter E-Series G2 Ultrasonic Meters. These meters use solid-state technology in a compact, tamper protected, weatherproof, and UV-resistant housing, suitable for residential applications. E-Series Ultrasonic meters meet and exceed ANSI/AWWA C715 Standards, and the lead-free bronze allow meters comply with the lead-free provisions of the Safe Drinking Water Act and NSF/ANSI Standards 61 and 372.[4]

The City of Bakersfield has decided to use the Badger meters to be consistent with Cal Water's Badger AMI system currently in place. Since Cal Water operates the City's water system, the use

[3] The 2020 audit is included as an attachment to this proposal.
[4] The Product Data Sheet provided by Badger Meter is included as an attachment to this proposal.

of Badger Meters will create a "plug and play" scenario for Cal Water's monitoring and billing system, simplifying the integration of the new meters between Cal Water and the City. The commitment to use Badger meters is memorialized in Resolution No. 086-2022, passed by the City Council on June 1, 2022.[5]

Over the course of the year following project implementation, the Bakersfield Water Resources Department will monitor the list of meters replaced and compare usage pre-meter and post-meter installation to verify actual water savings.

Evaluation Criteria #2: Renewable Energy

Subcriterion B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery

Not applicable to this project.

Subcriterion B.2: Increasing Energy Efficiency in Water Management

- Describe any energy efficiencies that are expected to result from implementation of the water conservation or water efficiency project (e.g., reduced pumping).
- If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.

In 2020, the City's total water production was 45,649 acre-feet with a total electrical cost of $3,231,261 to run the water system. This results in a cost of $70.78 per acre-foot. With an estimated annual water savings of 221.1 acre-feet, the project will save an estimated $15,651 per year in energy costs. The system consumed a total of 21,056,732 kWh in 2020, with a cost of $6.5166 per kWh. Implementation of this project would save approximately 2,401.72 kWh of energy per year.

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

Based on results from the United States Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator[6], the reduction in energy consumption would result in a reduction of 1.7 Metric Tons of CO2 equivalent annually.

[5] The resolution is included as an attachment to this proposal.
[6] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

- 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 City owns 72 groundwater wells that each vary from 500 gpm to 2000 gpm. The City also has several booster stations. In addition to groundwater, Bakersfield receives treated surface water from Cal Water's Northwest Treatment Plant and from the Kern County Water Agency's (KCWA) Improvement District No. 4 (ID4) Henry C. Garnett Water Purification Plant. The water from ID4 originates from the State Water Project (the Delta). This project would reduce pumping requirements, energy usage, and reliance on the Delta by reducing residential water consumption rates.

- 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 calculated energy savings are based on reductions of water usage from the City of Bakersfield's municipal water system.

- Does the calculation include any energy required to treat the water, if applicable?

Yes, the calculation provided is a total system energy cost which includes water treatment.

- 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 by eliminating the need to perform manual reads for the water billing cycle, which in turn reduces greenhouse gas emissions by reducing the usage of gas-powered vehicles. Manual reads are conducted on a monthly basis using four Ford F150 trucks.

Table 1. Vehicle Mile Reduction Calculations

Element	**Assumption**
Vehicle Mileage	19 miles/gallon
	287 gallons of fuel
Duration of Meter Reads	72 days
Miles Driven	5,460 miles/annually
Vehicles Used	4 vehicles

Based on these calculations, the project would result in a total reduction of 5,460 vehicle miles traveled per year with an estimated reduction in greenhouse gas emissions totaling 2.6 Metric Tons of CO2 per year, based on results from the U.S. EPA Greenhouse Gas Equivalencies Calculator.

- 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).

There are no renewable energy components included in this project.

Evaluation Criteria #3: Sustainability Benefits

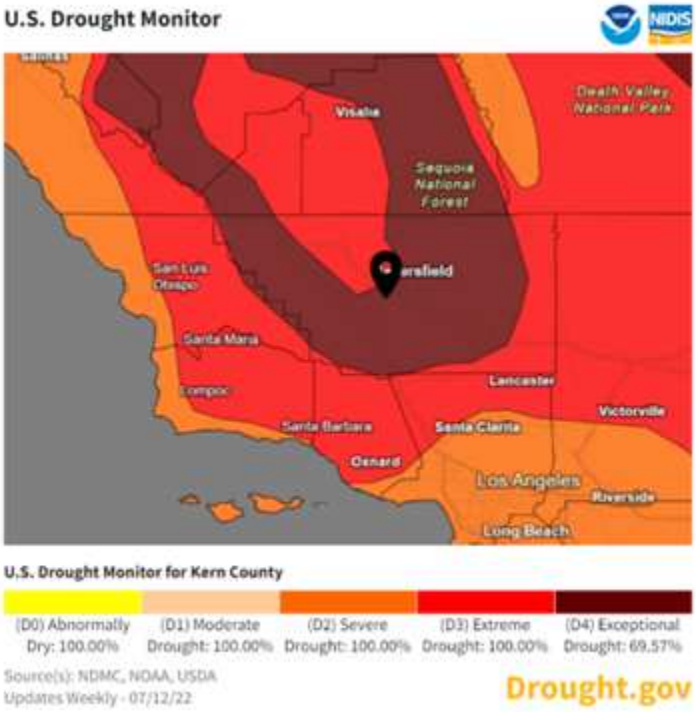
Enhancing Drought Resiliency

- Does the project seek to improve ecological resiliency to climate change?

This project seeks to improve ecological resiliency to climate change by improving the efficiency of Bakersfield's municipal water system and reducing system losses. Bakersfield has a history of extreme droughts. From 2012 to 2016, the City reported the driest four-year statewide precipitation on record (2012 to 2015) and the smallest Sierra-Cascades snowpack on record (2015, with 5% of average). This drought was also marked by extraordinary heat: 2014, 2015, and 2016 were California's first, second, and third warmest year in terms of statewide average temperatures. In 2014, USA Today reported an average of nearly 90% of Bakersfield in the exceptional drought category over the first seven months of 2014 – more than any other large urban area in the country at the time.

On May 26, 2022 Kern County was moved back into the 'exceptional drought' category by the U.S. Drought Monitor, marking 17 months of one of California's worst droughts on record. The National Integrated Drought Information System (NIDIS) map reflects the 'exceptional drought' distinction – 69.57% of Kern County falls into that category, including Bakersfield (see Figure 2 below). According to NIDIS, this is the 3rd driest year to date over the past 128 years.

Figure 2. U.S. Drought Monitor



- 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).

Installation of AMI will reduce system water losses, but the anticipated water savings will likely have minimal impact on the storage durations within the system.

- Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)? 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).

No, the project does not benefit any federally threatened or endangered, candidate species, state listed species, or species of particular recreational or economic importance. The scope of the project is limited to installing meters for a municipal water system within a residential zone.

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

Not applicable.

- Will the project directly result in more efficient management of the water supply? For example, will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?

Two-way communication with the BEACON Advanced Metering Analytics (AMA) system, which is designed to support the E-Series G2 Ultrasonic Meters, will enable the City to more effectively understand and proactively manage water usage in the project area.

- Projects that are intended to improve streamflows or aquatic habit, and that are requesting $500,000 or more in Federal funding, must include information about plans to monitor the benefits of the project. Please describe the plan to monitor improved streamflows or aquatic habit benefits over a five-year period once the project has been completed. Provide detail on the steps to be taken to carry out the plan.

Not applicable.

Addressing Specific Water Sustainability Concern(s).

- 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 City of Bakersfield's water sustainability is being impacted by the current drought across the state. After Governor Newsom called for statewide water conservation in October 2021, the State Water Resources Control Board's Emergency Drought Conservation Regulation became effective in January 2022. In tandem, the City of Bakersfield's Water Resources Department issued ongoing mandatory water restrictions for all Domestic Water System customers effective December 14, 2021. Despite these efforts, statewide drought conditions continue to worsen.

The City is currently on Stage 2 of its Water Shortage Contingency Plan (WSCP) developed with the California Water Service. The plan includes water restrictions at each stage. Current restrictions for City of Bakersfield residents and businesses include:

- Prohibit the use of potable water for washing sidewalks, driveways, buildings, structures, patios, parking lots, or other hard-surfaced areas;
- Require shut-off nozzles on hoses for vehicle washing with potable water;
- Limit outdoor landscape and turf water usage to three days per week and only after 6 p.m. and before 9 a.m.

- Prohibit outdoor water usage during and 48 hours after a rain event resulting in measurable precipitation
- Drinking water may not be served, other than upon request, in eating or drinking establishments
- Hotel and motel guests must be provided with option of choosing not to have towels and linens laundered daily

Additionally, the City of Bakersfield is experiencing a boom in population. Between the 2010 and 2020 U.S. Census, the population grew from 347,483 to 403,455 (an increase of over 16%). This increased demand further compounds and necessitates efforts to conserve water in a region with historically high vulnerability to drought conditions and the increasing frequency of drought brought on by climate change.

- 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.

The City of Bakersfield has a strong reliance on fossil fuels. In 2021, the Guardian reported that Kern County produces about 70% of California's oil and about 90% of the state's natural gas. That same year, the Los Angeles Times reported that Kern County's Board of Supervisors passed an ordinance to approve thousands of new oil wells drilled in the next 15 years. About 1 in 7 workers in the county work in the oil industry, including workers in Bakersfield.

Poor air quality is an effect of the oil industry in Bakersfield. Bakersfield Californian reported that in 2020, Bakersfield experienced the worst dip in air quality of all midsized metropolitan areas across the country. According to data from the U.S. Environmental Protection Agency, the median AQI in Bakersfield from 2019 to 2020 went from 67 to 81, with the city seeing 11.3 percent fewer days of good air quality. These changes in air quality pose risks for vulnerable individuals particularly sensitive to pollution, and disproportionately impact disadvantaged communities.

Recent wildfire trends in the state have also had impacts. The Windy and KNP Complex fire in 2021 caused large amounts of smoke to gather in the city. According to the California Air Resources Board, the area that Bakersfield encompasses is surrounded by high mountains, creating an environment where smoke and other harmful pollutants become trapped. In addition to creating poor air quality, the wildfires have also prompted rolling blackouts from PG&E and other public utilities across the state. CNBC reported that in 2019, more than 2 million people were left without power amidst one of the worst wildfire seasons in state history. The blackouts are in response to poor upkeep of utility equipment, which has been reported to spark several destructive wildfires in recent years.

- 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?

This project will catalyze the City of Bakersfield's transition to an AMI-operated municipal water system, with the goal of conserving water on a city-wide level to confront the increasing severity and frequency of drought in California.

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

Conserved water will remain in the water system and will contribute to residential and commercial water uses over time, offsetting the need to pump additional groundwater or divert additional water from the Kern River.

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

Not applicable.

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

All water savings created by the project will be used for the intended purpose of future residential and commercial use.

<u>Other Project Benefits</u>

- *Combating the Climate Crisis: E.O. 14008*: "Tackling the Climate Crisis at Home and Abroad", focuses on increasing resilience to climate change and supporting climate-resilient development. Please describe how the project will address climate change, including:
    - Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.
    - Does this proposed project strengthen water supply sustainability to increase resilience to climate change?
    - Will the proposed project establish and utilize a renewable energy source?
    - Will the project result in lower greenhouse gas emissions?

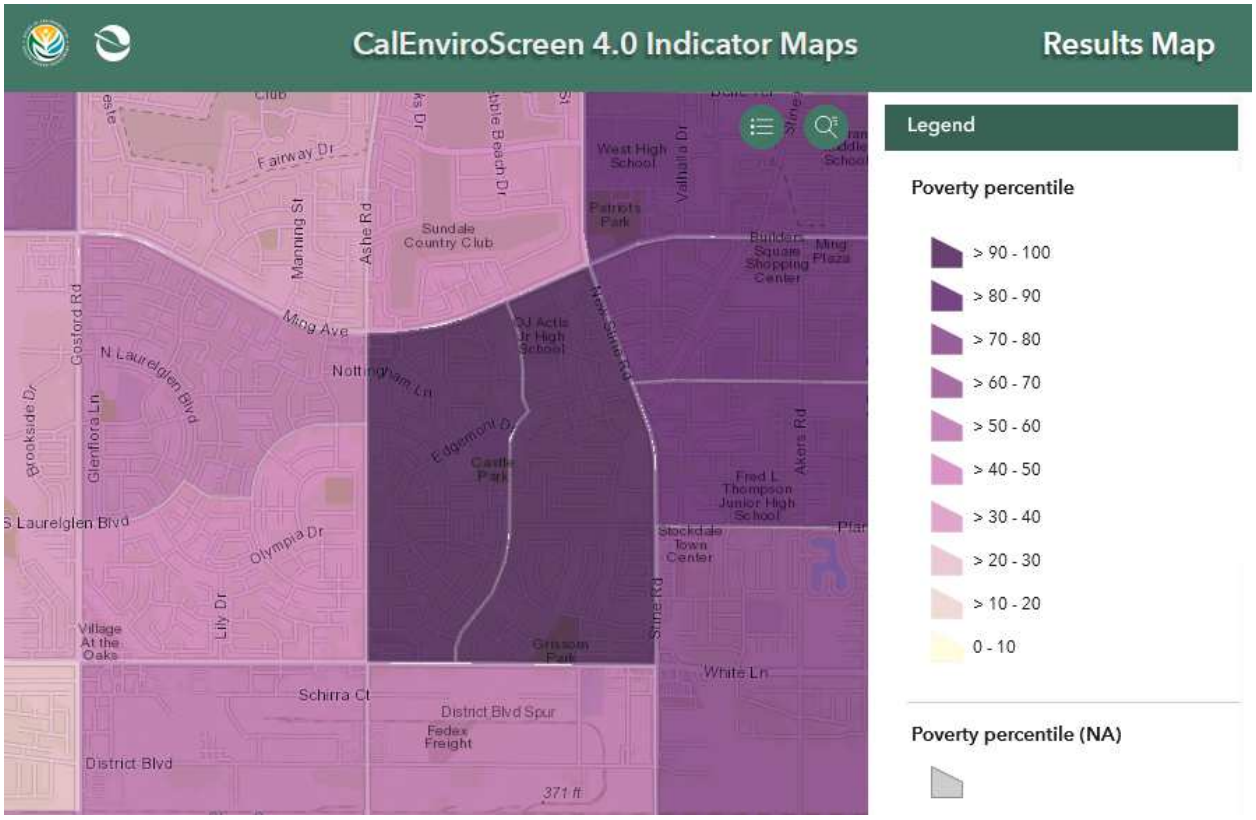
This proposal will contribute to the goals outlined in Executive Order 14008 by strengthening water supply through enhanced conservation efforts to increase resilience to climate change. The conservation benefits of AMI meters are well-documented. The project will also lower greenhouse gas emissions by reducing the energy consumption of the water system by reducing usage and eliminating the need for manual meter reads in the project area, thereby reducing the number of vehicle miles traveled by Cal Water staff to service the water system.

- *Disadvantaged or Underserved Communities*: E.O. 14008 and E.O. 13985 support environmental and economic justice by investing in underserved and disadvantaged communities and addressing the climate-related impacts to these communities, including impacts to public health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including:
    - Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to: public health and safety through water quality improvements, new water supplies, new renewable energy sources, or economic growth opportunities.
    - 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 a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the State, or the applicable state criteria for determining disadvantaged status.
    - 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 a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

Executive Order 13985 defines underserved communities as “populations sharing a similar characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.” The E.O. includes a list of population groups, which includes “Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders, and other persons of color; members of religious minorities; lesbian, gay, bisexual, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.”

The City of Bakersfield has a long history of struggling with chronically high poverty. According to the 2020 U.S. Census Data, Bakersfield has a poverty rate of 17.2%. The per capita income is $27,309, which is 22.82% lower than the national average. Bakersfield also has an increasingly diverse population, with 51.1% of residents identified as Hispanic or Latino in the 2020 Census, 31.4% identified as White, 8.9% identified as Two or More Races, 7.4% identified as Black or African American, and 7.3% identified as Asian.

Figure 3. CalEnviroScreen 4.0[7] Poverty Indicator Map



CalEnviroScreen 4.0 is a mapping tool that uses environmental, health, and socioeconomic information to produce scores for every census tract in the State of California. Figure 2 above shows the project location's scores on the poverty indicator.

Evaluation Criteria #4: Complementing On-Farm Irrigation Improvements

Not applicable to this proposal.

[7] https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

Evaluation Criteria #5: Planning and Implementation

Subcriterion E.1— Project Planning

- Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Does the project address an adaptation strategy identified in a completed WaterSMART Basin Study? Please self-certify or provide copies of these plans where appropriate to verify that such a plan is in place. Including a specific excerpt or a link to the planning document may also be considered where appropriate.

Not applicable to this project.

- Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.

Cal Water's 2020 Urban Water Management Plan[8] for the Bakersfield District is a long-range planning document for water supply and system planning. This planning document identifies the effort to pilot Automatic Meter Reading (AMR) and AMI in several Cal Water districts. Contained in the Urban Water Management Plan is the Bakersfield District Conservation Master Plan for 2021 - 2025. Section 4.4 covers Water System Efficiency. "Broad adoption of AMI would allow Cal Water in the future to detect and alert households of leaks and other possible problems as well as provide customers with tailored water use information to help them use water more efficiently."

- 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).

This project aligns with the Bakersfield District Conservation Master Plan's goal of supporting the broad adoption of AMI by piloting plans for a city-wide conversion effort with the installation of AMI in a residential zone in the City of Bakersfield.

- 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 (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes).

[8] https://www.calwater.com/docs/uwmp2020/BK_2020_UWMP_FINAL.pdf

Not applicable to this project.

Subcriterion E.2— Readiness to Proceed

- Identify and provide a summary description of the major tasks necessary to complete the project. Note: please do not repeat the more detailed technical project description provided in Section D.2.2.2. Application Content. This section should focus on a summary of the major tasks to be accomplished as part of the project.

Based on consultation with prospective vendors, the City of Bakersfields anticipates that the procurement and shipping process could take up to 12 months due to issues with the global supply chain. Once meters are received, the City will assign a four person work crew to replace meters in the identified project area with new AMI installations. The City anticipates installing the AMI meters at a rate of 500 meters per month.

- Describe any permits that will be required, along with the process for obtaining such permits.

There are no permits required to move forward with the installation of AMI pursuant to the proposed scope of work.

- Identify and describe any engineering or design work performed specifically in support of the proposed project.

There is no engineering or design work required to move forward with the installation of AMI pursuant to the proposed scope of work.

- Describe any new policies or administrative actions required to implement the project.

There are no new policies or administrative actions required to move forward with the installation of AMI pursuant to the proposed scope of work.

- Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete). Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation Regional or Area Office?

Table 2. Project Schedule

Task	Start	Duration
Procurement and Product Shipping	Month 1	12 months
AMI Installations in Project Area (Rolling as meters are received)	Month 1	24 months

Due to the nature of the project scope, the City of Bakersfield did not consult with the Reclamation Regional or Area Office regarding environmental and cultural compliance.

Evaluation Criteria #6: Collaboration

- 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?

On June 1, 2022, the City Council of Bakersfield considered a resolution enabling staff to move forward with procuring the Badger Meter AMI and kickstart the long-term effort to transition to AMI on a City-wide scale. This resolution was supported unanimously by the six members present, with one member absent from the vote.

- What is the significance of the collaboration/support?

AMI installations would be handled by Cal Water work crews through the existing operations and maintenance contract.

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

The success of this project will support a long-term initiative to convert the City of Bakersfield's entire water system to AMI. Demonstrating a successful effort with this project will generate local support for additional funding to support AMI meter installations, which will result in future water conservation improvements throughout the City.

Evaluation Criteria #7: Additional Non-Federal Funding

- Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided using the following calculation:
    - Non-Federal Funding / Total Project Cost = X%

The City of Bakersfield intends to cover the cost of additional meters that exceed the federal contribution amount and cover the cost of labor for installation, with a total local contribution of $792,605.95 and a total project cost of $1,292,435. This results in a local match rate of 61.33%.

Evaluation Criteria #8: Nexus to Reclamation

- Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider:
    - Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?
    - If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?
    - Will the proposed work benefit a Reclamation project area or activity?
    - Is the applicant a Tribe?

The proposed project does not have a nexus to an existing Reclamation project or activity.

Performance Measures

- Provide a brief summary describing the performance measures that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved). For more information calculating performance measure, see Appendix A: Benefit Quantification and Performance Measure Guidance)

The City of Bakersfield will assess the post-project impact using the following metrics:

- Comparing post-project water measurement data for the project area (deliveries, diversions, and waste/spills) to pre-project data–taking into account other factors which may have caused the changes. This comparison will include data from one year post-project and one year pre-project.
- Comparing post-project water system energy consumption data to pre-project data–taking into account other factors which may have caused the changes. This comparison will include data from one year post-project and one year pre-project.
- Tracking the number of leaks detected post-AMI meter installation within one year of the conversion to AMI.
- Surveying customers in the project location area to assess frequency of AMI portal usage and the perceived impact that AMI has had on their consumption.

Budget

Table 3. Budget Breakdown

Budget Item Description	Computation		Quantity Type	Total Cost
	$/Unit	Quantity		
Supplies and Materials				
E-Series G2 Ultrasonic Meters	$180.77	5,500	EA	$994,235
Contractual/Construction				
California Water Service Company Contract for Meter Installation	$298,200	1	EA	$298,200
Total Estimated Project Costs				**$1,292,435**

Budget Proposal and Funding Plan

Table 4. Summary of Non-Federal and Funding Sources

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. City of Bakersfield	$792,605.95
Non-Federal Subtotal	**$792,605.95**
REQUESTED RECLAMATION FUNDING	**$499,829.05**

- The budget proposal should include detailed information on the categories listed below and must clearly identify all items of cost, including those that will be contributed as non-Federal cost share by the applicant (required and voluntary), third-party in-kind contributions, and those that will be covered using the funding requested from Reclamation, and any requested pre award costs (Table 2).

Table 5. Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$499,829.05
Costs to be paid by the applicant	$792,605.95

Value of third-party contributions	$0
TOTAL PROJECT COST	**$1,292,435**

Budget Narrative

Supplies and Materials

- Itemize supplies by major category, unit price, quantity, and purpose, such as whether the items are needed for office use, research, or construction. Identify how these costs were estimated (i.e. quotes, pas experience, engineering estimates, or other methodology).

The amount budgeted for the E-Series G2 Ultrasonic Meters is based on a quote received from a sales representative that works with Badger Meters. The quote is attached as supporting documentation.

Contractual/Construction

- Identify all work that will be accomplished by subrecipients, consultants, or contractors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. For each proposed contract, identify the procurement method that will be used to select the consultant or contractor and the basis for selection. All contracts with an anticipated value of $10,000 or more must use a competitive procurement method. Only contracts for architectural/engineering services can be awarded using a qualifications-based procurement method. If the qualifications-based procurement method is used, profit must be negotiated as a separate element of the contract price.

Cal Water will provide the labor to install AMI meters in the project location through their existing operations and maintenance contract with the City of Bakersfield. The amount budgeted is based on a Work Order generated by Cal Water, with a cost of $247,499.98 for labor, $999.96 for materials necessary to conduct the work, and $49,700.04 for overhead and administrative costs. The overhead charges are capped at 10% per the existing agreement with the city. The Work Order Information form is attached as supporting documentation.

Pre-Award Costs

In addition, please identify whether the budget proposal includes any project costs that may be incurred prior to award. For each cost, describe:

- The project expenditure and amount

- The date of cost incurrence
- How the expenditure benefits the project
    - Pre-Award Costs

There are no pre-award costs being requested as part of this proposal.

Environmental and Cultural Resources Compliance

- 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 will not impact the surrounding environment.

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

The City of Bakersfield has a Metropolitan Bakersfield Habitat Conservation Plan (MBCHP) that lists all federal threatened or endangered species within the Bakersfield area. The purpose of the Plan is to "preserve and enhance native habitats which support endangered and sensitive species" and take careful consideration when performing projects. The species within the MBCHP will not be affected by any activities. There is no designated critical habitat in the Project area.

- 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 no wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States."

- When was the water delivery system constructed?

The water delivery system was constructed from the mid-1970's to mid-1980's. The project area consists of housing tracts that were built and constructed throughout the years mentioned.

- 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.

- 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.

There are no buildings, structures, or features listed on the National Register of Historic Places within the project area.

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

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

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

The project will not have an adverse effect on the population in the project's impact area.

- 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 have any impact on tribal lands or Indian sacred sites.

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

Required Permits or Approvals

There are no required permits or approvals necessary to move forward with this project.

Conflict of Interest Disclosure Statement

Per 2 CFR §1402.112, the City of Bakersfield is required to state if any actual or potential conflict of interest exists regarding this proposal at the time of submission. There is currently no conflict of interest and there are no potential conflicts that have been identified.