

TRI-COUNTY WATER AUTHORITY
Water and Energy Efficiency Grant
Agricultural Metering Installation Project



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 - B Energy Savings Calculations
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1 Technical Proposal and Evaluation Criteria

1.1 Executive summary

Date:	November 13, 2024
Project Name	Electromagnetic Flow Meter Installation Project
Applicant Information	Tri-County Water Authority
City, County, State	Cocoran, Kings County, California
Application	Category A – Funding Group II (Application Period 2)
Grant Funding Requested	\$486,000
Match Funding	\$550,145
Project Duration/Completion Date	24 Months/October 2027

Project Summary:

Tri-County Water Authority (TCWA) seeks funding to equip approximately 71 existing agricultural groundwater extraction wells located across 29,000 acres of productive agricultural lands with advanced, automated metering devices. The groundwater wells are not currently metered and groundwater extraction data is currently determined via less-than-accurate evapotranspiration estimates from crop use. Metering the wells is anticipated to result in **annual water savings of up to 11,680 acre-feet per year (afy)¹ and associated energy savings of \$465,000 per year and reduction of 1,164 metric tons of CO₂-equivalent emissions per year.** TCWA is a Groundwater Sustainability Agency (GSA) -- one of eight in the Tule Groundwater Subbasin in California's central San Joaquin Valley -- and is working proactively to meet 2040 groundwater management goals mandated by the state's 2014 Sustainable Groundwater Management Act (SGMA). It is estimated that nearly 12,000 acres (up to half of TCWA's active farmland) will be retired from production between now and 2040 if groundwater management improvements are not taken. The data provided by the new flow meter equipment is essential in better understanding the location and depth at which pumping is occurring

¹ Direct Water Savings: savings as a result of metering are estimated to be **5,840**
Indirect Water Savings: savings influenced (not a direct result of) by metering are estimated to **5,840**
Combined, if both savings are realized, the total water savings possible is estimated to be **11,680**. Further details on this methodology are in Criterion A of this application.

and allow TCWA water managers and TCWA members better clarity in managing critical groundwater resources in the basin.

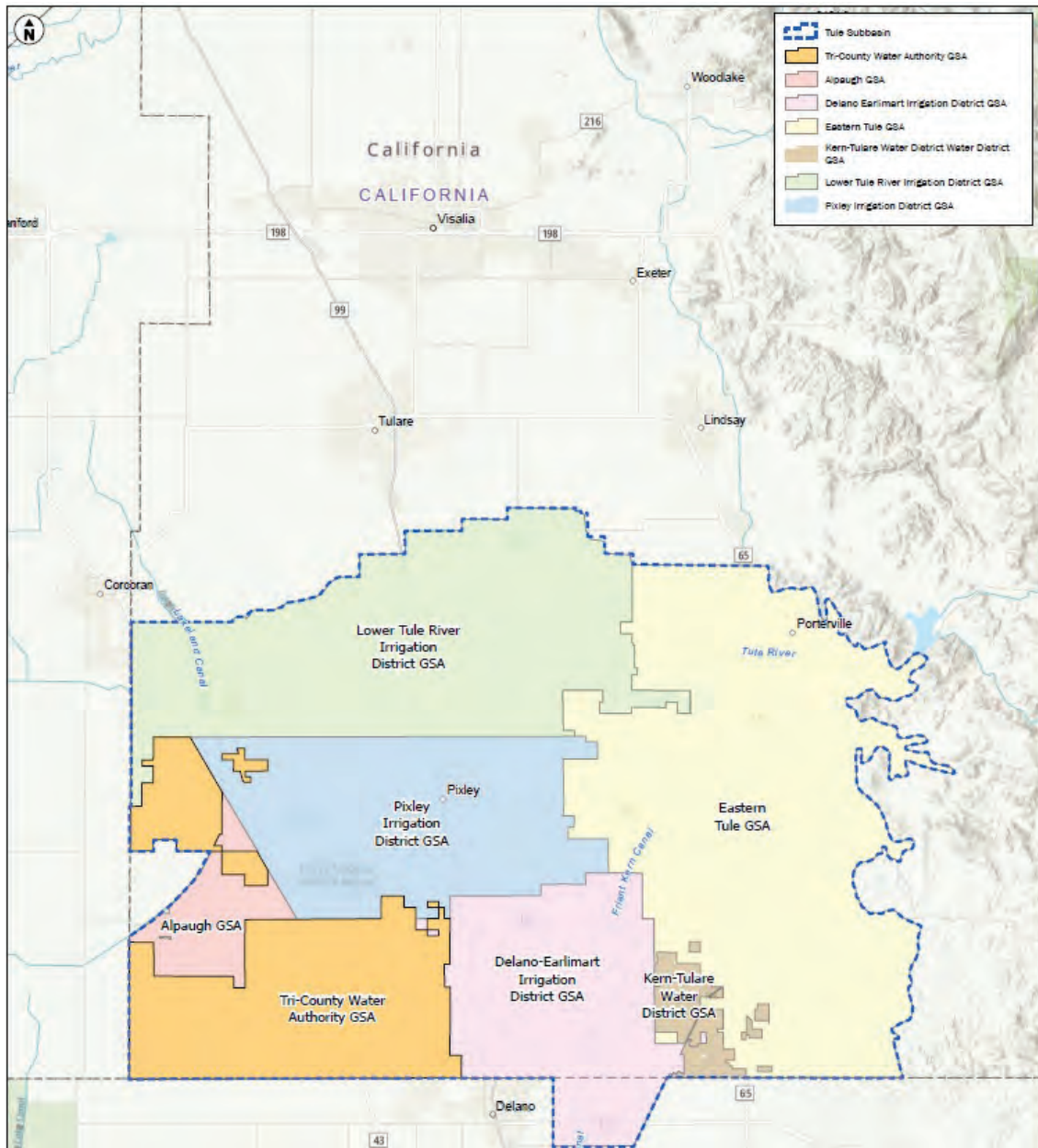
1.2 Project Location

The TCWA GSA is located in Tulare and Kings Counties, north of the Kern County line², and exists in the southwestern portion of the Tule Groundwater Subbasin (the Subbasin; see Figure 1). The subbasin is located in the south-central portion of the greater San Joaquin Valley. Land use within the Tule Subbasin is predominantly agricultural with many families having farmed in the area since the 1850s. Crops grown in the Tule Subbasin include included grapes, fruit trees, nut trees, dairy support crops (alfalfa, wheat and corn) and cotton. In the last 20 years, the amount of acreage dedicated to growing nuts and dairy support crops has increased.

The subbasin contains 13 localized urban areas, including the city of Porterville, and the communities of Allensworth, Alpaugh, Ducor, Earlimart, East Porterville, Pixley, Poplar Cotton Center, Richgrove, Terra Bella, Teviston, Tipton, and Woodville. According to the Census Block Group Data 2022, the Tule Subbasin has an estimated population of 152,577 people. Most of the land within the subbasin and surrounding areas is used for growing crops and raising livestock.

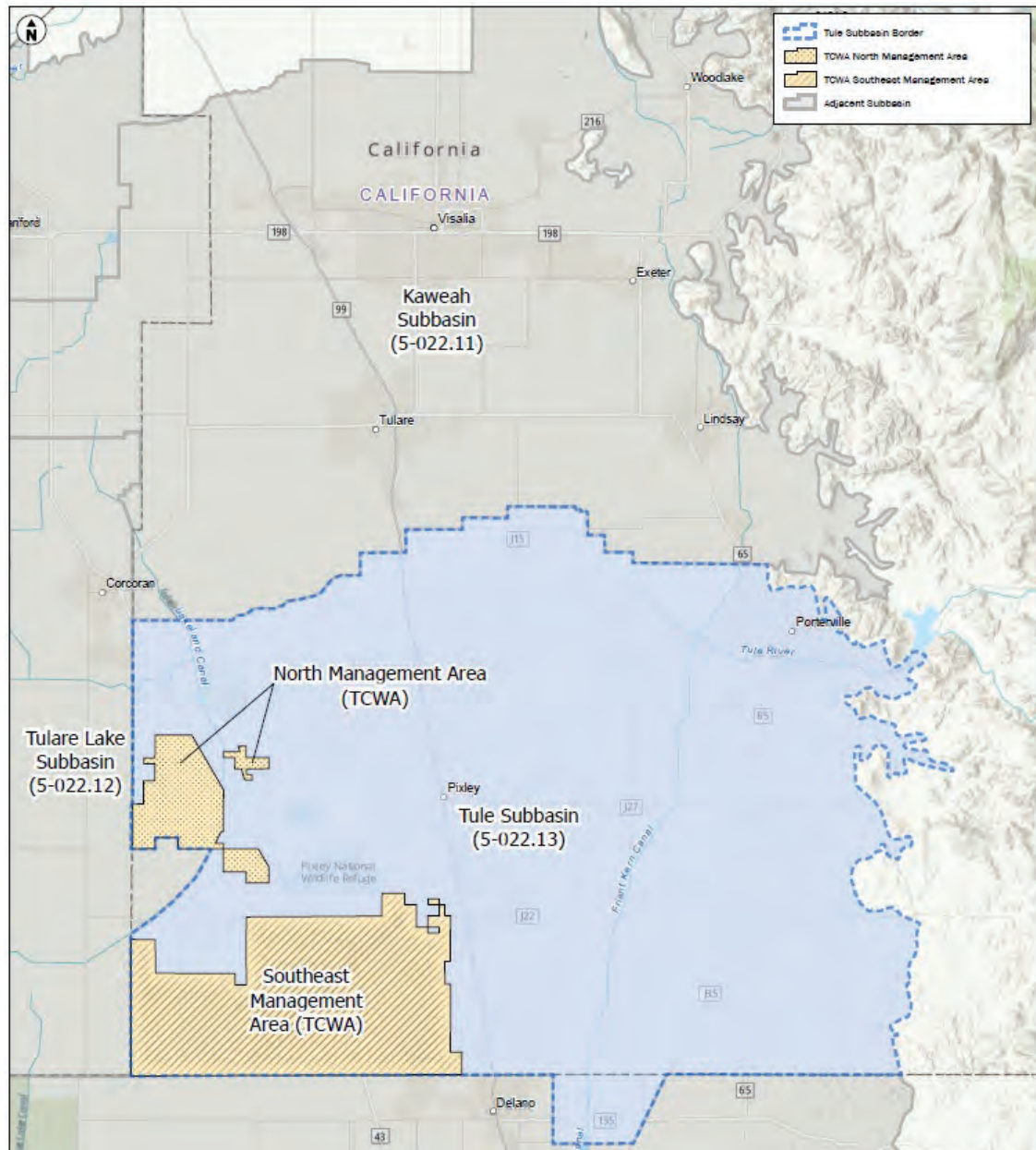
Figure 1. TCWA and regional GSAs in the Tule Groundwater Subbasin

² The 'Tri-County' portion of TCWA's name comes from its boundaries either holding or paralleling the three counties of Tulare, Kings, and Kern County.



TCWA manages approximately 69,000 acres separated into the North Management Area (12,282 acres) and Southeast Management Area (57,501 acres; see Figure 2). The North Management Area includes parts of the Angiola Water District, Deer Creek Storm Water District, and W.H. Wilbur Reclamation District. TCWA's Southeast Management Area covers parts of Atwell Island Water District, Allensworth Community Service District, unincorporated lands, Bureau of Land Management, Deer Creek Storm Water District, and State of California lands.

Figure 2. TCWA Management Area



Mirroring most of the Tule subbasin, the TCWA Management area's land use is mainly agricultural, with 29,000 acres (out of the 69,000 total acreage of the management area) in use as irrigated agriculture. The only urban lands are those of the Allensworth State Historic Park (SHP; within the Southeast Management Area), which houses approximately 500 residents. The park is serviced by wells operated by the Allensworth Community Services District. Allensworth CSD covers about 7,158 acres, with approximately 5,123 acres falling within TCWA (TCWA's 2024 GSP Update).

1.3 Project Background

As a GSA in the Tule Subbasin – considered one of the state’s high priority groundwater subbasins due to its ‘critically overdrafted³’ status -- TCWA is proactively working to manage groundwater for community, agriculture, and habitat. Following the enactment of SGMA, TCWA was established in 2016 as a non-profit with joint powers authority, managed by a five-person board of directors. TCWA’s serves a wide variety of water users including the state’s first community to be founded, financed, and governed by African-Americans (the town of Allensworth), agricultural interests that produce over \$165 million in annual crop revenue, federally managed lands and associated wetlands, and tribal interests from the nearby federally recognized Tule River Reservation.

TCWA adopted one of the first well metering programs in the region in 2020⁴ and adopted a water budget with allocations and pumping limits in 2021. In light of recent action by California’s State Water Resource Control Board to put the Tulare Lake and Tule Subbasins on probation⁵, TCWA’s foresight to prioritize installing consistent precision metering devices on all agricultural groundwater wells is justified. Accurate metered data will deliver clarity on the volume of groundwater extracted and create flexibility for TCWA to respond nimbly to changing water supply conditions.

Reducing Pumping to Enhance Groundwater Sustainability

GSAs in California were established following the state’s 2014 Sustainable Groundwater Management Act (SGMA)⁶, which has a goal of halting overdraft and achieving sustainability goals for the state’s priority groundwater basins by 2040. Statewide, groundwater accounts for up to 60 percent of the state’s total supply during drought, and 40 percent in average years. The story of bountiful agricultural production in the Tule Basina is the story of water use. In the 1960s, California built the State Water project, a water storage and delivery system, to move water from the Sacramento-San Joaquin Delta (Delta) in the north to the drier Central Valley and further south. However, as drought cycles became more recurring and ecologically sensitive habitat and fish from the Delta became more known, surface water allotments were curtailed.

This led to farmers pumping more groundwater to make up for dwindling surface water supplies. The central valley went through a severe drought in 2012-2016 where some farmers received only 5 percent of their contracted surface water allotments.⁷ This prolonged drought period and the associated groundwater depletion occurring in the Tule

³ [1] Overdraft occurs where the average annual amount of groundwater extraction i.e., from pumping, exceeds the long-term average annual supply of water to the basin.
<https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins>.

⁴ <https://tcwater.org/wp-content/uploads/2020/09/resolution-20-06-meter-policy-and-procedures.pdf>

⁵ https://www.waterboards.ca.gov/water_issues/programs/sgma/groundwater_basins/tule-subbasin.html

⁶ https://waterboards.ca.gov/water_issues/programs/sgma/about_sgma.html

⁷ <https://www.nytimes.com/2021/05/25/us/corcoran-california-sinking.html>

Basin as well as statewide helped prompt the state to enact the 2014 SMGA. SGMA gives the California Department of Water Resources (DWR) and the State Water Board oversight authority of GSAs to ensure they are working towards groundwater sustainability goals.

The Tule Subbasin receives a significant source of groundwater recharge from surface water received mainly from the Kings, Kaweah, and Tule Rivers and imported water from the California State Water Project. The Kings River and imported water contribute the most water to the Subbasin while the Kaweah and Tule Rivers only contribute during average to above average rainfall years. Water is also imported into the Subbasin through the State Water Project and Central Valley Project.

The primary source of water within the TCWA service area is from pumped groundwater used for agricultural, municipal/industrial, and domestic needs (see Table 1). TCWA’s Southeast Management Area is 100% reliant on groundwater and the North Management Area primarily relies on groundwater, with some lands receiving surface water supply from the Angiola Water District.

Table 1. TCWA Water Use by Sector

Water Use Sector	Water Source	Supply Percentage	Approximate Annual Use (acre-foot per year)
Urban / Municipal	Groundwater	100%	<200
Agriculture	Groundwater	91%	49,500
Agriculture	Surface Water	9%	4,500

Notes: 2022 Amended GSP

SGMA defined six sustainability indicators^[1] that GSAs must manage groundwater resources by to avoid undesirable results by 2040. Of the indicators, lowering groundwater levels and subsidence are particularly exacerbated concerns in the Tule Subbasin and TCWA service area. Because of the region’s particular clay soil conditions and unique aquifer conditions, which together can accelerate subsidence, the rate of change in land surface elevation between 1987 and 2018 in the western part of the subbasin – encompassing the TCWA service area -- was estimated to be approximately 12 feet over a 30+-year study period. In another basin study on groundwater storage, it’s estimated that the average annual change in groundwater storage over the period from 1990 - 2010, which represents average hydrologic conditions within the Tule Subbasin, was approximately -115,300 acre-ft/yr. This value represents the average annual historical overdraft of the subbasin.

Metering to Measure and Measuring to Stabilize Groundwater Elevations

As required by SGMA, TCWA developed and submitted a Groundwater Sustainability Plan (GSP) in 2020 to the DWR, a revised version based on DWR feedback in 2022, and a 2024 revised draft GSP update was submitted to DWR and State Water Resources Control Board. The GSP summarizes the hydrologic and hydrogeologic conditions in the

Tule subbasin and proposes actions to reach local sustainability goals that consider all beneficial uses and users of groundwater in the basin.

TCWA's 2024 GSP Update has a primary goal of balancing average annual inflows and outflows of water by 2040 so that long term negative change in storage does not occur after 2040, with the goal being avoidance of undesirable results caused by groundwater conditions throughout the Tule Subbasin. To do this, TCWA summarized and proposed seven distinct project management actions in their 2024 GSP Update, with implementation of a well meter program one of the actions and the focus of this grant funding proposal. Below is a summary of the well metering action from the 2024 GSP Update, with more details of its scope in the following project description section

6.2.4 Project 4: Well Meter Program

Project Type: Management action implemented by the GSA

Project Location: The policy will be in effect across the TCWA area within the Tule Subbasin.

Implementing Agency: TCWA

Measurable Objectives Addressed (§354.44(b)(1): The metering program will directly support meeting the measurable objectives for groundwater levels, subsidence, and water quality by providing important data on the amount and depth of the pumping. This data will help the GSA identify areas where pumping may be causing impacts and implement appropriate demand reduction measures.

Circumstances and Criteria for Implementation (§354.44(b)(1)(A): TCWA is committed to implement the meter program by December 2024.

Process to Provide Notice of Implementation (§354.44(b)(1)(B): TCWA is working with the Advisory Committee and directly with stakeholders to notify well owners of the program.

Estimated Annual Project Benefits (AFY) (§354.44(b)(2): The direct benefit will be to the impacted well owners.

Permitting and Regulatory Requirements (§354.44(b)(3): The policy is a management action that the GSA has the authority to implement without additional permits.

Project Schedule (§354.44(b)(4): TCWA is committed to implementing the meter program by December 2024.

Evaluation of Benefits (§354.44(b)(5): The benefit of the metering program is the ability to understand the location and depth pumping is occurring.

How will the project be accomplished, and what is the water source? (§354.44(b)(6): Management action focused on demand reduction and does not require an additional water source.

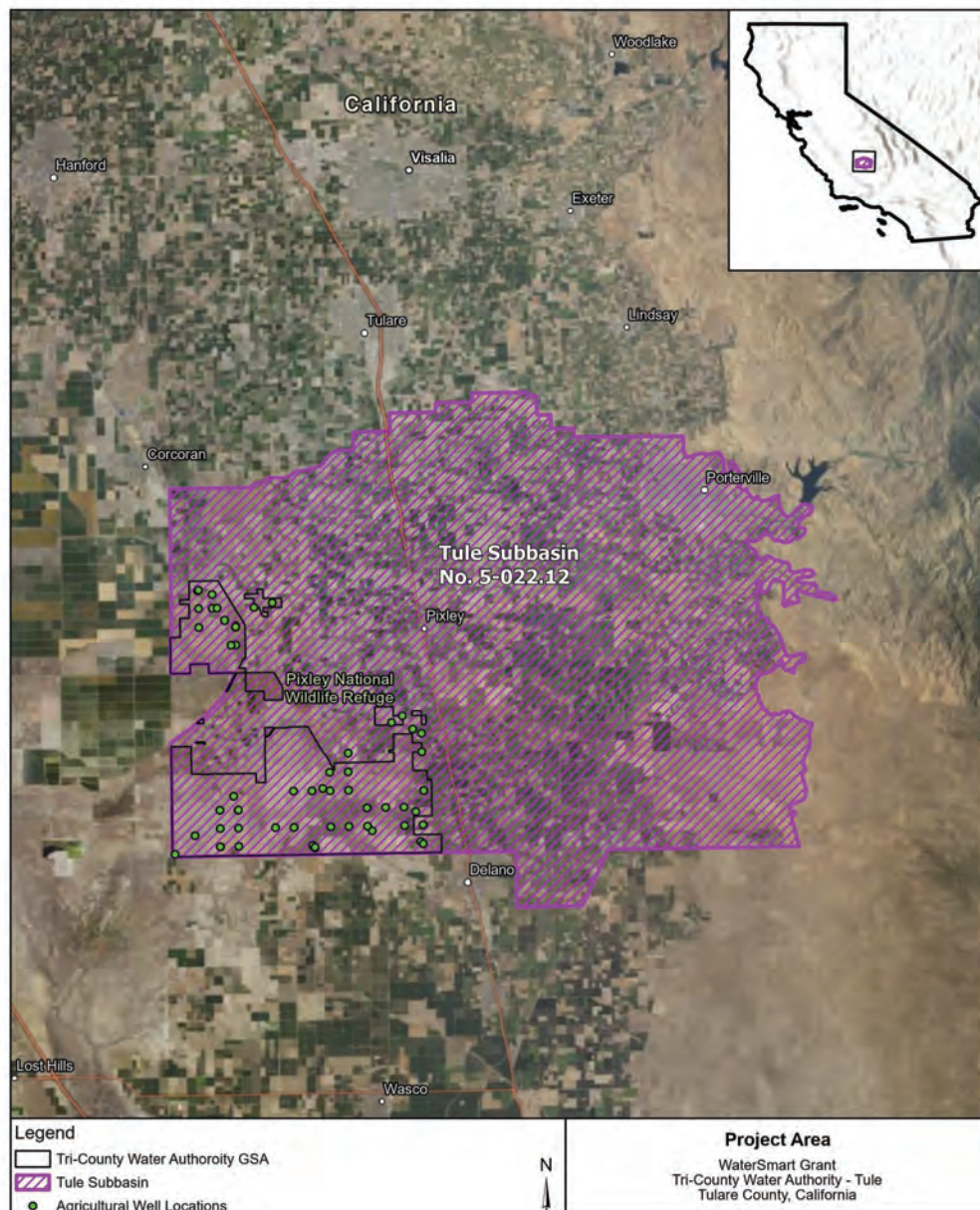
Legal Authority (§354.44(b)(7): The SGMA regulations grant the GSA with the authority to regulate groundwater pumping.

⁽¹⁾ https://resources.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Files/SGMA-Brochure_Online-Version_FINAL_updated.pdf

1.4 Technical Project Description

Groundwater pumping in the Tule subbasin needs to reduce from an estimated current amount of 667,000 acre-feet (AF) to 402,000 AF by 2040 to achieve sustainability goals. Of that amount, TCWA has to reduce from 56,000 AF to 18,000 AF which is a reduction of 68%. TCWA's service area has approximately 71 groundwater extraction wells uses for agricultural supply (see Figure 3).

Figure 3. Project Area showing Agricultural Well Locations



Currently, only some of the TCWA groundwater well stations are equipped with metering; however, they do not all adhere to SGMA metering requirements and therefore an upgrade of the small amount of meters to SGMA standards as well as installing SGMA-compliant meters on well stations that have none is the focus of this grant application. Given the state of the metering on TCWA agricultural wells, groundwater pumping is currently estimated rather than measured. Groundwater pumping estimates are performed at the field scale using automated monthly modeling provided by Land IQ. Land IQ ET is a data-driven model that uses remote sensing data (satellite imagery) coupled with ground bases sensor systems, crop mapping, and crop characteristics (e.g.,

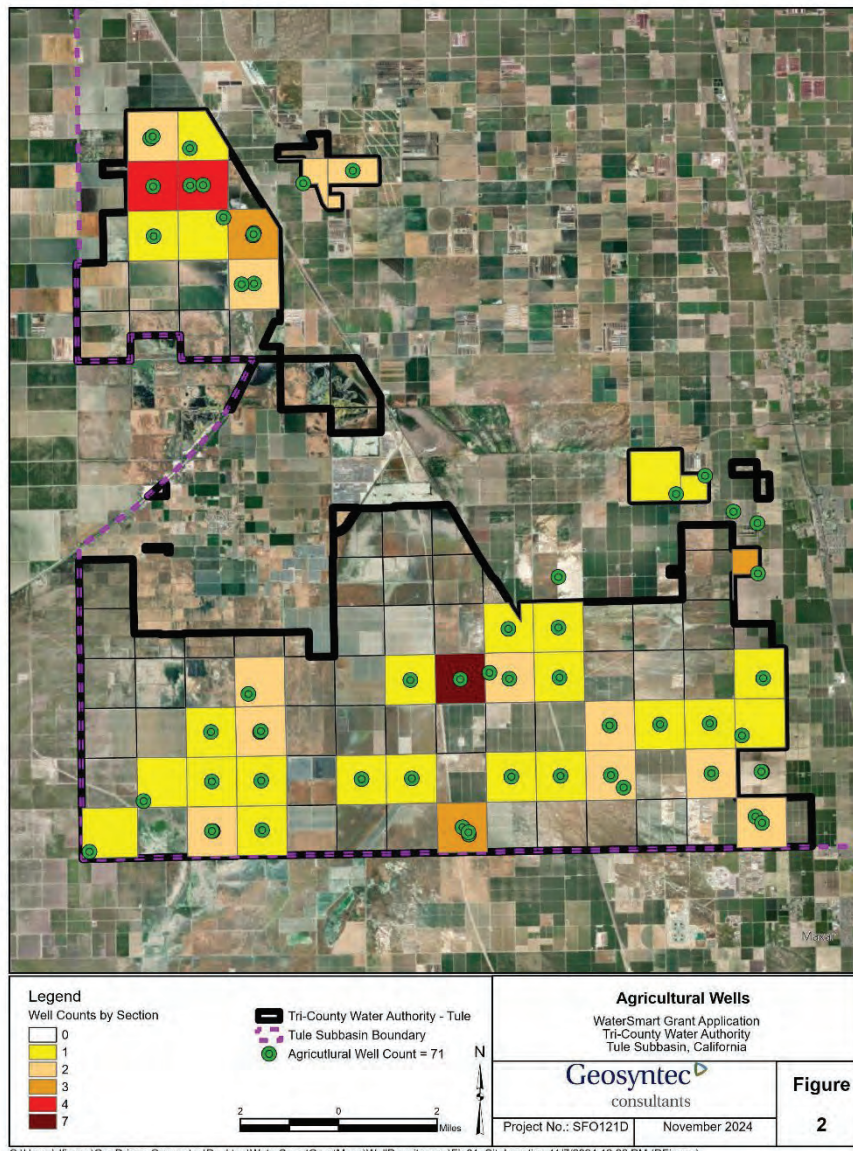
age, density, irrigation methods) to quantify the amount of water used by irrigated fields⁸. Since all agricultural irrigation in the study area is provided by groundwater pumping, the result (after accounting for local precipitation) is the monthly groundwater volume pumped across the study area.

TCWA has integrated the LandIQ ET estimation process into an online dashboard, BasinSafe, which summarizes monthly and annual groundwater use at the field scale and across the study area. BasinSafe also provides individual growers the opportunity to access and view their monthly groundwater use at the field scale via user accounts. These accounts help TCWA and groundwater users to track pumping over time and compare it to annual allocations.

The 72 wells are located throughout the TCWA, with the majority located in the southeast management area (see Figure 4).

Figure 4. Well Locations by Mangement Area

⁸ Additional information on the LandIQ ET process is available at <https://www.landiq.com/land-iq-et> or https://www.landiq.com/post/understanding-consumed-water-at-the-field-scale?utm_campaign=153e09c6-e721-4613-b179-4589438aa153&utm_source=so&utm_medium=mail&cid=a5e2f897-dbf6-4024-8a1d-9795522bdee5



Equipping the well stations with flow meters will provide an accurate pumping flow rate for each well station. The purpose of this technical memorandum is to outline the recommended criteria for selecting flow meters as part of a grant application.

The proposed equipment for tracking groundwater pumpage includes a flow meter, a telemetry unit and a cloud database. The flow meters are installed in line with the station piping to record the volumetric flow rate. This information is transmitted by a remote telemetry unit

In 2024, TCWA evaluated and prioritized flow meters based on a number of criteria (see Flow Meter Selection Criteria Memo, Attachment A). The memo factored in a range of factors including cost, accuracy, telemetry options, and installation process. The evaluated flow meters would all be compliant with the California Code of Regulations

Title 23, Division 3, Chapter 4.5, Article 3 and Section § 1042. The code has several criteria for a meter to measure groundwater extractions and report annual filing fees. Several of the scoring criteria includes in this technical memorandum are part of Section § 1042. The criteria of Code Section § 1042 that were not include in the scoring criteria include: calibration conducted by a qualified individual at least every five years; installed, maintained, operated, inspected, and monitored to ensure the accuracy is maintained; installed such that it is readily accessible; the totalizer shall be incapable of moving backwards or deviate from its actual value without obvious and apparent tampering.

Based on that assessment – two meters were recommended – the McMag 2000 and the McMag 3000. These meters are both saddle-insertion style, electromagnetic, and battery operated. Overall, TCWA considers the McMag 2000 as the preferred option because of the cost. However, because there are some well stations in the 71 wells targeted that may have unknown installation restrictions (e.g., the well stations do not have sufficient straight run pipe for the McMag 2000 that needs four upstream diameters of straight run pipe), the McMag 3000 may be preferred for a small subset of the targeted wells as it needs only three upstream diameters of straight run pipe. Based on this, TCWA is budgeting for either \$3,800 or \$6,050 per meter. Assuming an 80/20 split between the two meter recommendations, an assumed cost of \$4,200 was used for developing the budget.

The following tasks will be completed to implement the flow meter equipping project.

1. **Task 1 – Flow Meter Selection Criteria:** A flow meter study was conducted for developing this grant application to evaluate flow meters, remote telemetry units and cloud database software. Equipment recommendations were developed from the evaluation and a representative cost estimate as described above and included in Attachment A.
2. **Task 2 – Public Outreach:** TWCA will conduct a public outreach effort to contact the well owners for notifying them of the grant funds and flow meter equipping project. This may include, but is not limited to, dedicated meetings with TCWA members and local well owners to discuss the project, phone calls and email notifications to connect with the well owners, writing and mailing letter or flyers to the well owners, and one-on-one discussions with the well owners to register their well and join the flow meter project.
3. **Task 3 – Well Master Database & BasinSafe Update:** TCWA will develop a master well database of the TCWA wells. The information saved in the database will include owner contact information, well location, construction information and the most likely flow meter and telemetry unit to be installed at the well station. TCWA has an existing cloud database, BasinSafe, for tracking the estimated water usage. BasinSafe will be updated with the information documented in the master well database.

4. **Task 4 – Request Quotes for Flow Meter Equipment for Purchase and Installation:** TCWA will request quotes from local vendors to purchase and install the flow meter and telemetry units. The information collected to develop the master well database will be used to obtain quotes for each well station. The installation requirements for each well station may vary and affect the total cost.
5. **Task 5 – Flow Meter Equipment Installation:** After equipment quotes are approved by TCWA, local vendors will purchase and install the meter at the well station. The process is expected to happen over several months due to availability of the flow meters and the vendor.
6. **Task 6 – Documentation of the Flow Meter Equipment Installation:** After the equipment is installed at the well stations, TCWA will document the installations. This will include a site visit to each well station, documenting with pictures, verifying the meter location meets the manufacturer’s installation requirements, document the model and serial numbers, verifying the meter is recording instantaneous flow and total pumpage, and verifying the telemetry unit is report to the cloud database.
7. **Task 7 – Annual Reporting:** TCWA will compile and sum together the meter readings from the TCWA well owners. The total recorded pumpage will be compared to historical estimates of pumpage based on evapotranspiration and irrigation usage methods. Annual groundwater pumping and the estimated water savings will be reported to the California Department of Water Resources as part of the Annual SGMA reporting.
8. **Task 8 - BasinSafe Integration:** TCWA currently uses BasinSafe to track and account groundwater usage based on land usage, evapotranspiration, and irrigation methods. The groundwater pumpage recorded from the meters will be integrated with BasinSafe. The groundwater savings will be determined and tracked in BasinSafe.

1.5 Evaluation Criteria

Criterion A – Quantifiable Water Savings (25 points)

Up to 25 points may be awarded for this criterion. This criterion prioritizes projects that will conserve water and improve water use efficiency, supporting the goals of E.O. 14008. Points will be allocated based on the quantifiable water savings expected as a result of the project. Points will be allocated to give greater consideration to projects that are expected to result in more significant water savings.

All applicants should be sure to:

1) 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.

The installation of flow meters and telemetry systems on the wells within the TCWA service area in the Tule Basin will result in both direct and indirect water savings. For the purposes of this application, direct water savings are identified as that portion of water that will be conserved as a direct result of installing the metering infrastructure and indirect water savings are defined as the portion of water that will be conserved through measures that are supported by the metering infrastructure such as farm-scale irrigation management optimization and improved basins-scale management and monitoring of groundwater extractions. To calculate “direct” water savings (savings caused by metering implementation) and “indirect” water savings (savings influenced rather than caused by metering implementation, TCWA assumed the following:

Direct Savings: Current Pumping x 10% (Irrigation efficiency improvement)

Savings for the Southeast Managment Region: 5,700
 Savings from the North Management Region: 140
 Total: 5,840 af-yr based on 2023 Agriculture pumping estimates

Indirect Savings: Current Pumping x 10% (combination of conservation and management measures)

Savings for the Southeast Managment Region: 5,700
 Savings from the North Management Region: 140
 Total: 5,840 af-yr based on 2023 Agg pumping

The direct and indirect water savings estimated as a result of this project are summarized in Table 2 below.

Table 2. Estimated Water Savings from Metering Project

Water Savings	Annual Water Savings (Acre-Feet)
Direct Water Savings	5,840
Indirect Water Savings	5,840
Toal Water Savings	11,680

Calculations, details, and assumptions used to develop the direct and indirect water savings are provided in the sections below.

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

Current losses that will be conserved through the project come from over-irrigation, which results from the reliance on evapotranspiration-based groundwater accounting rather than direct measurement (through metering), will be enabled by the project. While the use of data-driven and calibrated ET models helps improve the accuracy of ET estimates currently used within the study area, these methods are still limited based on

the spatial and temporal resolution of input data (satellite imagery) which results in monthly estimates.

- *Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

Current over irrigation water goes to a number of places including:

- **Evapotranspiration** – this water is lost from the system as irrigated crops use more water than is needed for optimal productivity, and
 - **Seepage** – a portion of this water returns to the groundwater aquifer, though some is lost to storage within the upper soil layers.
- *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?*

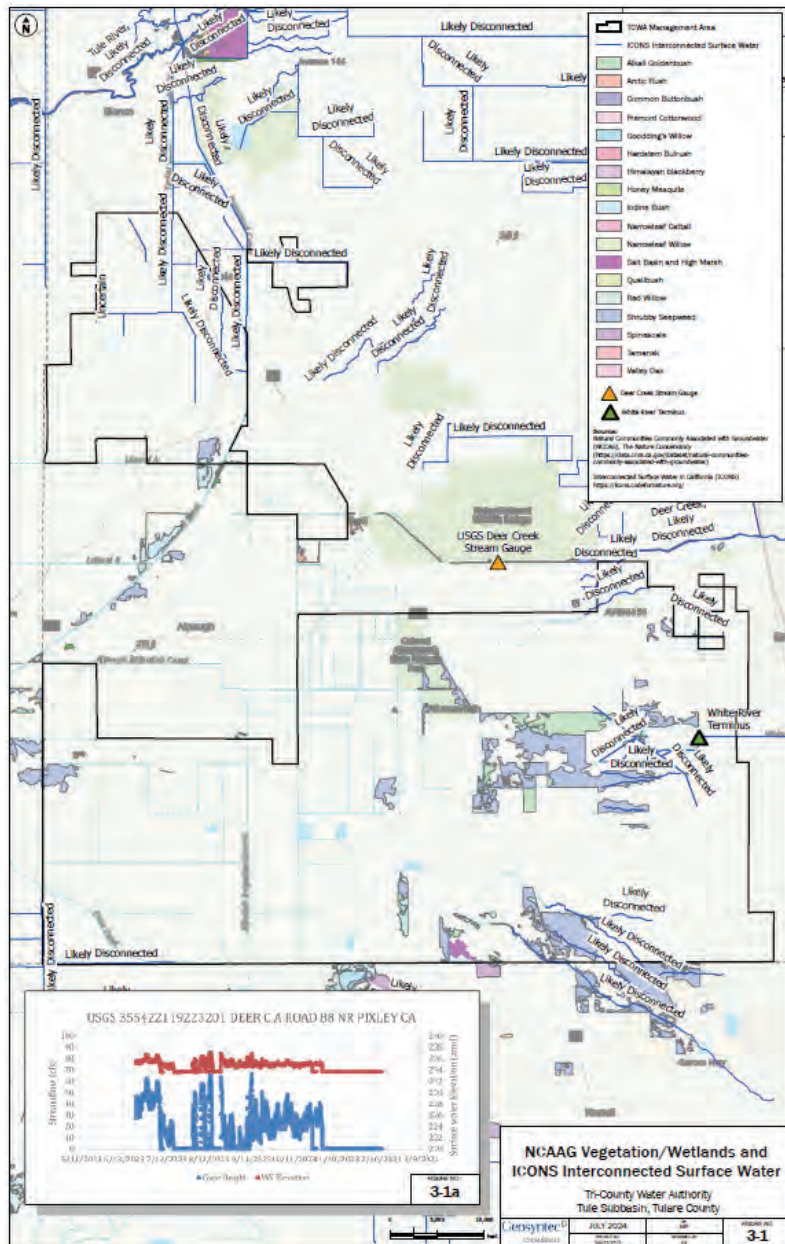
Current losses are returned in part to the upper (unconfined) aquifer. It should also be noted that water returned to the aquifer from seepage does not reach the lower confined aquifer from which it is pumped and reductions in pumping from the lower aquifer (direct water savings) have a larger benefit to basin wide-subsidence issues. Over irrigation also results in the flushing of higher levels of pollutants (fertilizers, pesticides, and salinity) into the soil, vadose zone, and groundwater. Precise accounting of the portion of seepage that remains available for future use are not available.

- *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?*

Seepage from agricultural irrigation is not a large source of environmental sustaining flows within the study area as the natural channels and streams that could collect and benefit from these flows have largely been replaced by irrigation canals and drains. Where interconnected surface waters (ISW) or groundwater dependent ecosystems exist, they are largely located in currently protected conservation areas and would benefit from the overall reduction in groundwater pumping (direct and indirect water savings) achieved by this program.

DWR Guidance on ISW suggests that the primary prerequisite for groundwater to be considered a factor in depletion of ISW is that groundwater elevations must be close to the elevation of the streambed and create connectivity between the surface water body and the groundwater through a saturated zone. As shown in Figure 5 (Figure 3-1 from the 2024 GSP Update), the unnamed streams in the TCWA area are likely disconnected from groundwater (The Nature Conservancy, 2023) and, therefore, ISW is not present in the TCWA area.

Figure 5. NCAAG Vegetation/Wetlands and ICONS-Interconnected Surface Water



The 20224 GSP further concluded that reducing groundwater pumping could benefit project area habitat and wetlands by helping to stabilize falling groundwater levels

3) 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. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal. In addition, note: 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.

The direct water savings reported in this application are derived using the following equation:

$$\text{Direct Water Savings} = \text{Current Water Use} \times \text{Irrigation Efficiency Improvement Factor}$$

Where:

Current Water Use is defined as the annual estimated irrigation within the project area (in acre-feet), and

Irrigation Efficiency Improvement Factor is defined as the percentage of current irrigation avoided by the addition of telemetry-enabled meters.

Current Water Use:

Current water use in the service area is estimated on a monthly and annual timescale using the LandIQ ET model described in Section 1.4. This is a data-driven evapotranspiration model that uses remote sensing data (satellite imagery), local climate data (meteorological stations), crop mapping and information to estimate the volume of water used by irrigated crops. After precipitation is accounted for (subtracted from ET), the result is the monthly and annual volume of groundwater pumped as shown in the equation below:

$$\text{Crop Groundwater Use} = \text{LandIQ ET} - \text{Precipitation}$$

Where:

Crop Groundwater Use: is the estimated volume of groundwater pumped (acre-feet per month or year),

LandIQ ET: is the crop water demand estimated by the LandIQ model accounting for field scale cropping patterns and irrigation efficiencies, and

Precipitation: is the monthly (or annual) precipitation volume (depth x area).

For the 2023 water year (October 1, 2022 to September 30, 2023) the crop groundwater use within the project area was 58,400 acre-feet.

Irrigation Efficiency Improvement Factor:

Previously funded WaterSmart metering programs have demonstrated the efficiency gained by installing meters and telemetry on groundwater wells. For example, the Middle Republican Natural Resources District (MRNRD) used a WaterSmart grant to install telemetry-enabled McCrometer meters in 2019, in the years since meter installation

MRNRD has seen observable, quantified water savings of 10% (per interview with Jack Russell – Manager MRNRD in Irrigation Leader).⁹

Direct Water Savings Summary

Using the current water use of 58,400 (WY 2023) and an irrigation efficiency improvement factor of 10%, the direct water savings attributable to the project are 5,840 acre-feet per year.

Indirect Water Savings:

The indirect water savings tabulated in this application are made possible through a combination of practices that will be supported by the project. These include irrigation management optimization (IMO), groundwater credit trading, and improved basin-scale groundwater management. These indirect water savings are in addition to the direct water savings quantified above. Potential indirect savings are tabulated below including:

- **Irrigation Management Optimization (IMO)** – IMO is a common irrigation practice that optimizes crop productivity based on precise and responsive control of irrigation in response to field moisture sensors or other field specific data. IMO requires accurate, timely, and precise measurement of irrigation which is made possible through telemetry enabled meters. A conservative 2% of current use is assumed through adoption of IMO practices facilitated by the addition of meters.
- **Groundwater Credit Trading** – TCWA allows groundwater credit banking and transfers through its *Groundwater Extraction Allocations Policy and Procedures*¹⁰. However, participation has historically been limited based in part on uncertainty in estimates of water quantity. The project will allow for precise measurement of pumping compared to allocations facilitating banking and potential transfers which can lead to more efficient water use throughout the project area. An additional 4% of current use is assumed to be conserved through trading/banking facilitated by the addition of meters.
- **Improved Basin-Scale Management** – Current basin-scale management options are limited based in part on uncertainty related to actual groundwater use. Without precise data, conservative assumptions and management are required which may not make best use of the available resources or potential management actions. The installation of meters and the integration of this data with the GSAs existing BasinSafe accounting platform will allow TCWA to more proactively respond to and anticipate various management scenarios and challenges. An additional 4% of current use is assumed to be conservable through improved basin-scale management made possible by the project.

⁹ https://issuu.com/waterstrategies/docs/ilws_april_2021

¹⁰ <https://tcwater.org/wp-content/uploads/2024/03/policy-and-procedures-for-groundwater-extraction-allocations-policy-and-procedures-revised-2024-mar-7.pdf>

Table 3. Potential sources of indirect water savings

Potential Indirect Savings	Percentage of Current Use	Annual Indirect Water Saving (Ac-ft/yr)	Source
Improved irrigation efficiency through Irrigation Management Optimization	2	1,168	Other similar programs have documented irrigation efficiencies ranging from 2% to 10% with higher efficiencies possible through the combination of telemetry enabled meters with irrigation management systems. MRNR District in Montana recorded annual savings of 10% following implementation of metering on wells. (2019 Irrigation District Magazine)
Groundwater Credit Trading	4%	580	TCWA Advisory Board
Improved basin scale groundwater management	4%	1,168	TCWA Advisory Board
Total Indirect Water Savings	10%	5,840	

4) Please address the following questions according to the type of infrastructure improvement you are proposing for funding. See Appendix A: Benefit Quantification and Performance Measure Guidance for additional guidance on quantifying water savings.

Irrigation Flow Measurement: Irrigation flow measurement improvements can provide water savings when improved measurement accuracy results in reduced spills and over-deliveries to irrigators. Applicants proposing municipal metering projects should address:

a.

How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.

Annual water savings estimates and calculations are summarized in the previous section.

b.

Have current operational losses been determined? If water savings are based on a reduction of spills, please provide support for the amount of water currently being lost to spills.

Current operational losses and spills have not been quantified nor are they used to quantify potential water savings. All water savings tabulated in this application are from reduced irrigation volume (pumped groundwater) enabled by adding telemetry enabled meters.

c.

Are flows currently measured at proposed sites and if so, what is the accuracy of existing devices? How has the existing measurement accuracy been established?

The well stations are not metered currently. The instantaneous pumping flow rate and total pumpage are unknown. Currently the pumpage estimates are based on evapotranspiration and land acreage. The goal of this project is to equip all TCWA well stations with flow meters to track the instantaneous flow rate and record the total pumpage.

d.

Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.

TCWA will equip the well stations with electromagnetic type flow meters. This type of meter has no moving parts and therefore requires limited maintenance. Also, electromagnetic type meters have less stringent installation requirements than a propeller type meter. The flow meter will have accuracies of +/- 1% to +/- 2% of total flow. All meters will be tested by a National Institute of Standards and Technology (NIST) facility that renews its NIST standards annually. Meters will be either the flanged or saddle-insertion style. The saddle-insertion style meter is the preferred option because it requires less modification to the piping. The meters shall be battery powered. General maintenance will involve changing the batteries after five years of use. These meters are manufactured for the agricultural industry. The recommended flow meter that meets these requirements is the McMag2000 or the DuraMag manufactured by McCrometer, Inc. of Hemet, CA.

The meters will automatically transmit the recorded flow data through a cellular remote telemetry unit to a cloud database. The meter will be equipped with a McCrometer SmartTrax telemetry unit; this is a battery power unit. The data will be transmitted to a McCrometer cloud database. The database will be an application programming interface (API), which allows TCWA to access this database. This allows TCWA to monitor real-time water use for groundwater management, and irrigation management efficiency. TCWA has an existing database - BasinSafe for tracking estimated water use for the TCWA landowners. The flow data recorded by the meter and stored in the API database will be transmitted to the BasinSafe database. This will be the main database for TCWA to track groundwater pumpage.

e. Will annual farm delivery volumes be reduced by more efficient and timely deliveries? If so, how has this reduction been estimated?

The installation of telemetry-enabled meters will allow growers to more accurately and predictably adjust the timing and delivery of pumped groundwater to their fields. Current irrigation volumes are based on estimates of evapotranspiration. Particularly when combined with other techniques (like the addition of soil moisture sensors) precise metering and control of groundwater deliveries can greatly improve the efficiency of irrigation and reduce total volumes. These potential additional efficiencies are included in the indirect water savings quantified in this application.

f.

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

Water savings will be verified on an annual basis by comparing the total pumped groundwater according to meter readings to the estimated pumped groundwater based on the current ET-based methodologies. Both systems will be maintained in order to provide redundancy and options for growers who can use the ET data for irrigation management optimization and other purposes. Annual meter readings and annual ET will be summarized in TCWA annual reports.

Criterion B – Renewable Energy (20 or 6 points)

Up to 20 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency and reduced greenhouse gas emissions.

For projects that include constructing or installing renewable energy components, please respond to Subcriterion B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery. If the project does not implement a renewable energy project but will increase energy efficiency, please respond to Subcriterion B.2. Increasing Energy Efficiency in Water Management. If the project has separate components that will result in both implementing a renewable energy project and increasing energy efficiency, an applicant may respond to both.

This project does not install new renewable energy capacity but provides increased energy efficiency as documented in Section B.2 below.

E.1.2.2 Subcriterion B.2—Increasing Energy Efficiency in Water Management

Up to 6 points may be awarded for projects that address energy demands and reduce greenhouse gas emissions by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.

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.*

The project will result in quantifiable energy savings due to the reduced pumping. These energy savings are quantified as 4,653,000kWh per year as summarized below. Detailed energy savings calculations and assumptions are provided in Attachment B.

Energy savings are calculated only for the estimated direct water savings (that portion of the total water savings which is directly attributed to the telemetry enabled meter installation project, e.g., improved irrigation efficiency). Energy savings are not quantified for the estimated indirect water savings, though these may also be significant.

Energy savings are a direct function of the volume of groundwater pumped, the depth from which this water is pumped, and the rate of pumping. For these calculations, well information from the Tule GSP was interrogated and summarized within the project area, key inputs and variables in Table 4 below include:

Table 4. Tule Basin GSP Well Evaluation – Inputs and Sources

Input/Variable	Value	Units	Source
Number of wells	72	Na	CA DWR Well Database
Average lift per well	145	feet	CA DWR Well Database
Direct Water savings	5,840	Acre-ft per year	This application.

Note: Indirect water savings estimated to be 5,840 afy. As reference above, energy savings from indirect water savings are not quantified in this application; however, they are likely significant and will be better understood following the first annual performance monitoring period following implementation of the new metering program.

Applying this information with typical pump and motor efficiency values of 80% results in **annual power requirements of 4,653 MWh (4,653,000kWh)**. This is the power required to pump 10% of the current total annual groundwater extracted in the project area and is the amount of power saved through avoided pumping related to the direct water savings of this project.

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

To calculate the energy savings, we estimate the energy consumed by all agricultural pumps in the TCWA and apply the water savings rate. Using the Southern California Edison (SCE)¹¹ 2022 Power Content Label⁽⁰⁸⁾, 4,653,000 kWh per year of avoided energy use in the TCWA area will equate to an **expected reduction in emissions of 1,165 metric tons (or 2,567,946 pounds) of Carbon Dioxide (CO₂) equivalent⁽⁰⁸⁾**. More details of the calculation methodology Energy Savings Calculation Methodology Sheet (Attachment B).

¹¹ To ensure TCWA's specific energy use was applied to greenhouse gas emission calculations, TCWA applied its 2022 emission factor data from SCE, it's local utility:
https://www.sce.com/sites/default/files/custom-files/PDF_Files/SCE_2022_Power_Content_Label_B%26W.pdf

- *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?*

Energy savings from water metering primarily result from reduced pumping needs. More precise metering not only reduces the pumped volume, but it also reduces the time that pumps are operating throughout the year. The resulting energy savings will scale directly with water savings (estimated in this grant application to be 10%).

Current pumping requirements in the service area total approximately 58,400 acre-feet per year. This water is provided through approximately 72 groundwater wells serving an irrigated area of 29,000 acres (an average of about 400 acres per well). Pumping demands per well vary significantly based on water demand (type of crop grown and irrigation methods) as well as the timing (max flow rate) and required lift (depth of groundwater). In general, vertical turbine pumps like the Xylem Deep Well Turbine (DWT)¹² pumps which can provide flows up to 8,000 gallons per minute (gpm) and provide total pumping head (pressure) of more than 1,000 feet are commonly used. This project does not propose changes to the types of pumps currently in use and only accounts for reduced pumping hours to account for the direct water savings.

- *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.*

Energy savings estimates are from the point of pumping (groundwater well), and do not account for any associated downstream energy reductions (e.g., for conveyance or distribution through pressurized irrigation systems). These savings could be additional but are not quantified in this application.

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

This calculation does not include energy required for treatment as irrigation water pumped from groundwater in the project area is not treated in most cases.

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

Reductions in vehicle miles driven has not been estimated or quantified as it is not expected for this project.

- *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).*

Minor energy savings through the use of solar powered telemetry and sensor systems for the climate stations added as a part of this project will be realized. The proposed meters and telemetry units are battery powered.

Criterion C – Other Project Benefits (15 points)

Up to 15 points may be awarded under this criterion. This criterion prioritizes projects that address a specific water and/or energy concern(s), including enhancing drought

¹² <https://www.xylem.com/siteassets/brand/goulds-water-technology/resources/brochure/brvtpai.pdf>

resilience and sustainability, addressing the current and future impacts of climate change, and providing ecological benefits.

Resilience and Sustainability Benefits. *Will the project address a specific water and/or energy sustainability concern? Please address the following:*

- *Explain and provide detail of the specific issue(s) in the area that is impacting water resilience and sustainability. Consider the following:*

- o Describe recent, existing, or potential drought or water scarcity conditions in the project area.*

- o Is the project in an area that is experiencing, or recently experienced, drought or water scarcity?*

- o Describe any projected increases to the severity or duration of drought or water scarcity in the project area. Provide support for your response (e.g., reference a recent climate informed analysis, if available).*

Since approximately 1987, groundwater levels in the Tule Subbasin have exhibited a chronic decline. Without intervention to reverse this trend, the sustainability of the groundwater resource is at risk, leading to undesirable outcomes. The primary driver of this chronic decline is the extraction of groundwater at rates exceeding both natural and artificial recharge over multiple years, encompassing both wetter and drier than average conditions. This issue intensifies during natural drought cycles, particularly when restrictions on imported water supplies increase groundwater extraction. Factors such as increased regulatory requirements in the Delta may limit the availability of imported supplies from Millerton Lake to the Tule Subbasin. Additionally, climate change could further impact the rates of natural and artificial recharge.

Related to groundwater extraction and overdraft effects, land subsidence in the TCWA area and Tule Subbasin is a direct, observable result of prolonged groundwater level declines due to extensive pumping, especially during periods of low precipitation and limited surface water supplies. The rates and extent of subsidence vary across the subbasin due to different pumping patterns and hydrogeological conditions. Even if groundwater levels stabilize, residual subsidence from past overdraft can continue for years. Excessive pumping can cause deep subsidence, leading to aquifer compaction, loss of storage capacity, and damage to surface features like bridges, canals, flood control systems, and water supply pipelines. Subsidence can take two shapes that are defined as elastic (land recoverable if water levels rise) and inelastic (permanent land loss). Elastic subsidence generally occurs in coarse-grained aquifer materials, while inelastic subsidence, primarily from clay compression due to groundwater extraction,

accounts for most subsidence in the San Joaquin Valley. Significantly in TCWA's service area, the main town of Corcoran has sunk over 11 feet in the past 14 years, as summarized in a 2021 news article.

- *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.*

Irrigated agriculture and associated water-delivery systems are the focus of this grant application. Generally, water savings from metering will reduce overall pumping demand and thereby electricity demand in the area. In the last 5 years, rolling blackouts in the San Joaquin Valley have increased due to excess power demand caused by extreme heat, stemming from a four-year-drought starting in 2020 that was the state's worst in recorded history by some records.¹³

Energy savings from water metering primarily result from reduced pumping needs. More precise metering not only reduces the pumped volume, it reduces the time that pumps are operating throughout the year. For the proposed project, the resulting energy savings will scale directly with water savings – so an estimated 10% energy **and** water savings. Power savings will have a benefit in increasing available supply during anticipated more frequently occurring hot periods in the region.

- *Please describe how the project will directly address the concern(s) stated above.*

- *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?*

Yes. Metering the 72 wells will allow more flexibility for water management with the service area. Following annual performance monitoring, water managers will have much greater accuracy in understanding total irrigation supply and demand and how much supply is available during high-demand periods like irrigation season (April – October).

- *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.*

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

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

¹³ <https://water.ca.gov/News/News-Releases/2022/Oct-22/New-Water-Year-Begins-Amid-Preparations-for-Continued-Drought>

If growers use the metering data to help implement Irrigation Management Optimization (i.e. get some soil moisture sensors and time irrigation to need) they can boost yield per acre using the same amount of water¹⁴. This could be a good way to maintain value and make up (in part) for land that may be fallowed/taken out active farming and production.

One of the most effective ways to increase crop yield is through precision irrigation systems, such as drip irrigation and soil moisture sensors. TCWA growers, applying the (new) metering data, could implement Irrigation Management Optimization (see Section A for further details). This could mean getting soil moisture sensors and time irrigation to need. This would both boost yield and is a good way to maintain value. These technologies ensure that water reaches the plant roots directly, minimizing waste and optimizing plant health. Precision irrigation leads to significant improvements in water efficiency, which is crucial in areas prone to drought.¹⁵

Will the project assist States and water users in complying with interstate compacts?
Yes, as discussed in the Project Background section, metering is required for TCWA's water service area to adhere to SGMA mandates.¹⁶ This metering project will ensure TCWA reaches its metering goal.

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

Groundwater declines are an ever-present issue in the TCWA and broader Tule Basin water service areas. In 2022, the state curtailed water rights¹⁷ to over 20,000 water right holders in response to the multi-year drought, this included the Deer Creek watershed in TCWA's service area. By returning up to 11,680 afy to the groundwater systems in savings, the project will increase available water supply for use in water-short years.

Ecological Benefits. *In addition to the separate WaterSMART Environmental Water Resources Projects NOFO, this NOFO places a priority on projects that result in ecological benefits, through this section and other sections above, consistent with the SECURE Water Act. Please provide information regarding how the project will provide ecosystem benefits, including the following:*

- *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).*

¹⁴ <https://www.farmraise.com/blog/advanced-irrigation-management-for-farming>

¹⁵ <https://echonet.org/regions/northamerica/sustainable-techniques-crop-yields/>

¹⁶ https://www.waterboards.ca.gov/water_issues/programs/sgma/groundwater_basins/tule-subbasin.html

¹⁷ <https://www.waterboards.ca.gov/drought/delta/>

- *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, recreational benefits, etc.).*

Yes. The aquifer system in the TCWA service area has an upper (unconfined) aquifer and a lower (confined) aquifer. Water returned to the upper aquifer (e.g., from seepage) does not reach the lower confined aquifer from which it is pumped. Reduction in pumping from the lower aquifer has a large benefit to basin wide-subsidence issues (i.e., preventing them).

- *Will the proposed project reduce the likelihood of a species listing or otherwise improve the species status?*

No.

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

Over irrigation -- from over pumping --- results in the flushing of higher levels of pollutants (fertilizers, pesticides, and salinity) into the soil, vadose zone, and groundwater. These impacts to the upper aquifer in the Project Area affect local species and habitat and vegetation drinking from surface water bodies in hydraulic connection with the upper aquifer. Reducing pumping would reduce impacts from pollutants to habitat and plant life.

Reduced land fallowing resulting from the more efficient use of groundwater enabled by the metering project also has direct ecological benefits as land removed from production and fallowed poses a high risk to adjacent habitat and conservation areas due to increased potential for soil loss, erosion, and dust.

Note: 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

Climate Change: E.O. 14008 emphasizes the need to prioritize and take robust actions to reduce climate pollution; increase resilience to the impacts of climate change; protect public health; and conserve our lands, waters, oceans, and biodiversity.

- *Describe how the project addresses climate change and increases resiliency. For example, does the project help communities adapt to bolster drought resilience?*

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

- *Does the proposed project seek to reduce or mitigate climate pollutions such as air or water pollution?*

- *Does the proposed project include green or sustainable infrastructure to improve community climate resilience?*
- *Does the proposed project contribute to climate change resiliency in other ways not described above?*

Historically in the San Joaquin Valley (and statewide), groundwater levels usually rise during the winter wet season and decrease during the rest of the year, especially during summer. As climate change brings longer and more extensive droughts and as it concentrates the precipitation in the already-wet winter months, we can expect lower water levels in groundwater aquifers across the valley, further worsening water quality. These problems were observed during both the 2012–2016 and the 2019–2023 drought.

Typically, in California, 60 percent of the water supply is from surface water (rivers, lakes, surface water reservoirs), and about 40 percent comes from groundwater. However, during a drought the situation is reversed, and the main source of water becomes groundwater. For example, during the 2012–2016 drought, about 60 percent of the water used came from groundwater and 40 percent was from surface water. The drought resulted in higher costs for the agricultural sector (e.g., energy required to pump more groundwater) and in farmers over pumping of groundwater, and it triggered long-lasting effects including groundwater levels dropping beyond the reach of thousands of private and community wells.¹⁸

The proposed metering project directly reduces the two consequences of drought: higher energy costs and the over pumping that causes power cost escalation. These factors translate into longer-term climate resiliency – both for TCWA service members as well as associated GSAs in the Tule Basin. Estimated energy and water savings of up to **11,680 acre-feet per year (afy)**¹⁹ and associated energy savings of **\$465,000 per year (saving of 4,653 MWh (4,653,000kW))** and **reduction of 1,164 metric tons of CO₂-equivalent emissions per year**

Criterion D—Disadvantaged Communities, Insular Areas, and Tribal Benefits (15 points)

Up to 15 points may be awarded based on the extent that the project demonstrates support for the Biden-Harris Administration’s priorities, including E.O. 14008: Tackling the Climate Crisis at Home and Abroad and the President’s memorandum, Tribal Consultation and Strengthening Nation-to-Nation Relationships.

Please address only those priorities that are applicable to your project. It is not necessary to address priorities that are not applicable to your project. A project will not necessarily receive more points simply because multiple priorities are addressed. Points

¹⁸ https://www.ucsusa.org/sites/default/files/2021-10/UCS_CA_water_adapt_toolkit_Eng_201023a_web.pdf

¹⁹ Direct Water Savings: savings as a result of metering are estimated to be **5,840**
Indirect Water Savings: savings influenced (not a direct result of) by metering are estimated to **5,840**
Combined, if both savings are realized, the total water savings possible is estimated to be **11,680**. Further details on this methodology are in Criterion A of this application.

will be allocated based on the degree to which the project supports one or more of the priorities listed, and whether the connection to the priority(ies) is well supported in the application.

E.1.4.1 Subcriterion D.1. Disadvantaged Communities

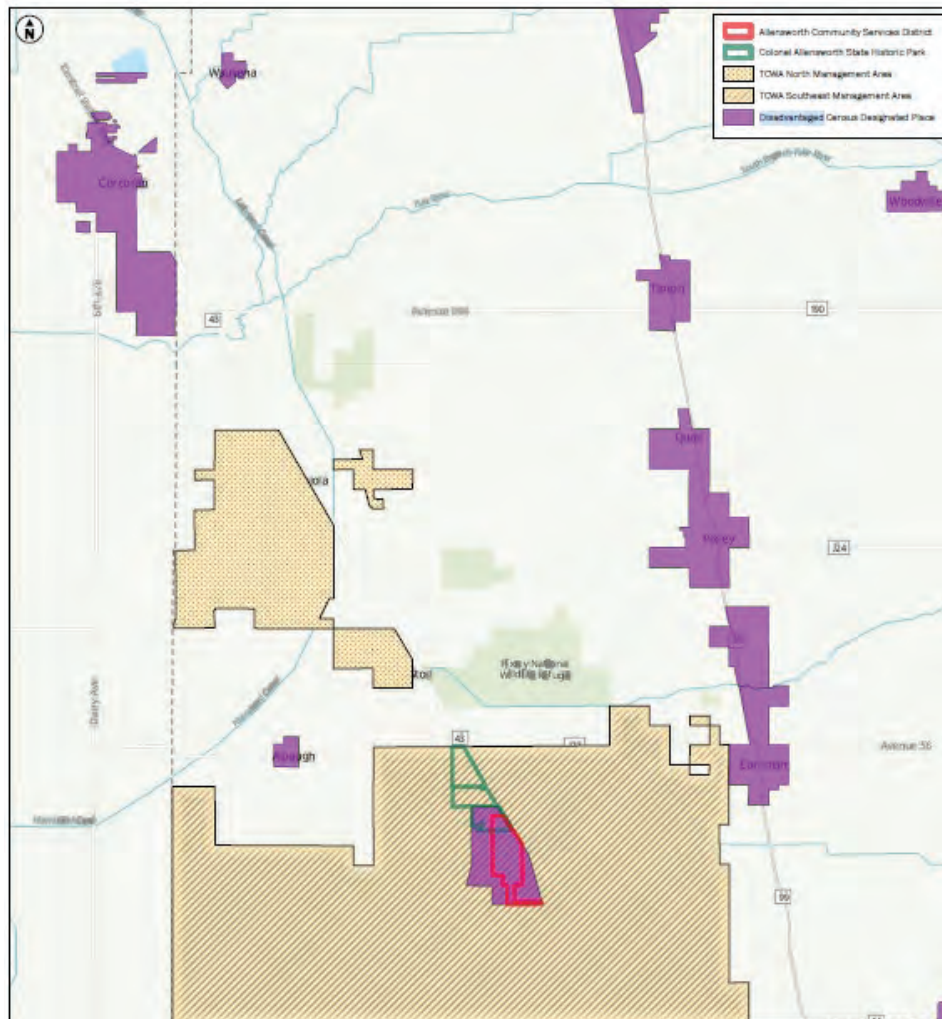
E.O. 14008 affirms the advancement of environmental justice for all through the development and funding of programs to invest in disadvantaged communities. This criterion, which is used to identify projects that advance the Justice 40 Initiative, includes all Federally recognized Tribes and Tribal entities, and any disadvantaged communities in insular areas (American Samoa, Guam, the Northern Mariana Islands, or the Virgin Islands) identified pursuant to the following criteria.

- *Please use the White House Council on Environmental Quality’s interactive Climate and Economic Justice Screening Tool (CEJST), available online at Explore the map - Climate & Economic Justice Screening Tool (screeningtool.geoplatform.gov/en/#17.59/36.63278/-105.181329) to identify any disadvantaged communities that will benefit from your project. The CEJST developed by the White House Council on Environmental Quality is a geospatial mapping tool that utilizes publicly available, nationally consistent data sets related to climate change, the environment, health, and economic opportunity to identify disadvantaged communities. In addition to identifying specific census tracts that are disadvantaged, the CEJST includes the lands of Federally **Notice of Funding Opportunity No. R24AS00052** recognized Tribes as disadvantaged communities. In addition, regardless of whether a Federally recognized Tribe has land, all Federally recognized Tribal entities are considered disadvantaged communities for the purposes of the Justice40 Initiative.² According to the White House Council on Environmental Quality’s interactive Climate and Economic Justice Screening Tool (CEJST) and EPA EJScreen mapping tool, communities within the Tulare Lake and Tule Subbasins are considered disadvantaged based on several factors. Tulare Lake Subbasin in Kings County is considered low income (82nd percentile), in linguistic isolation (96th percentile), and 51 percent of people ages 25 years or older have less than a high school education. Tule Subbasin in Tulare County is considered low income (95th percentile), Energy Cost (90th percentile), housing cost (94th percentile), unemployment (99th percentile), linguistic isolation (99th percentile), and poverty (92nd percentile). Together, the subbasins are in the 95th State percentile for drinking water non-compliance and 95th National percentile for particulate matter 2.5 (PM 2.5).*

The town of Allensworth is located in TCWA’s service area (see Figure 6. for census tract mapped disadvantaged communities in the project area) and is the first community in California to be founded, financed, and governed by African Americans. Allensworth has an estimated population of nearly 600 persons and an estimated 140 housing units (Tulare County – adopted Allensworth Hamlet Plan). According to Disadvantaged Communities (DAC) GIS data, the 2016 median income for Allensworth Census Designated Place (CDP) is \$29,091. The projected 2030 population for Allensworth is 683 persons and 160 housing units (Allensworth Hamlet Plan) In the 1960’s the state of

California discovered high levels of arsenic in the drinking water, which caused most of the residents to leave, with only 34 remaining. In 1976 the California State Parks and Recreation Commission approved plans to develop the Colonel Allensworth State Park. Today the Allensworth Community Services District provides water to the community.

Figure 6. Disadvantaged Community Census Tracts in and around TCWA Service Area



•If applicable, describe how the proposed project will serve or benefit a disadvantaged community, identified using the tool. For example, will the project improve public health and safety by addressing water quality, add new water supplies, provide economic growth opportunities, or provide other benefits in a disadvantaged community?

The disadvantaged communities within the project areas in Kings and Tulare counties are low-income communities that are affected to a greater extent by water quality concerns, and an increase in water and energy costs. Adding meters to agricultural wells across TCWA land will result in more efficient groundwater pumping to meet crop demands, resulting in water savings and less energy consumption. Water system efficiencies are particularly important when considering the impacts of climate change and the impacts of drought to the San Joaquin Valley. According to the San Joaquin Valley Region Report

(Fourth Assessment, 2022)²⁰, the socioeconomic and environmental conditions of the Valley are among the most precarious in California. Climate change has and will continue to exacerbate conditions faced by lower income communities. Water savings will result in greater water supply reliability and will help to alleviate disproportionate health and environmental effects for vulnerable local communities.

E.1.4.2 Subcriterion D.2. Tribal Benefits

The Department is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President's memorandum, Tribal Consultation and Strengthening Nation-to-Nation Relationships, asserts the importance of honoring the Federal Government's commitments to Tribal nations. Address the following, if applicable:

•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?

The Tule River Reservation is located east of the project site, in the Tule Subbasin (see Figure 7). The Tule River Reservation is federally recognized tribe of Native Americans, consisting of Yokuts, Yowlumne, Wukchumis, and Western Mono and Tübatulabal tribes. The tribe has used the waters within or near their original reservations including that of Tulare Lake, and Tule River and its tributaries, and since time immemorial. The addition of water meters will improve the efficiency of the system, resulting in less groundwater withdrawals.

According to the Hydrogeological Conceptual Model of the Tule Subbasin²¹, The Tule River and Deer Creek are hydraulically connected groundwater through streambed infiltration, return flow, and basin recharge. Any groundwater left in the aquifer will influence water being left in the rivers and eventually in Tulare Lake. Tulare Lake has historically been disappearing following 19th century farming practices and has recently been re-emerging due to increased runoff.

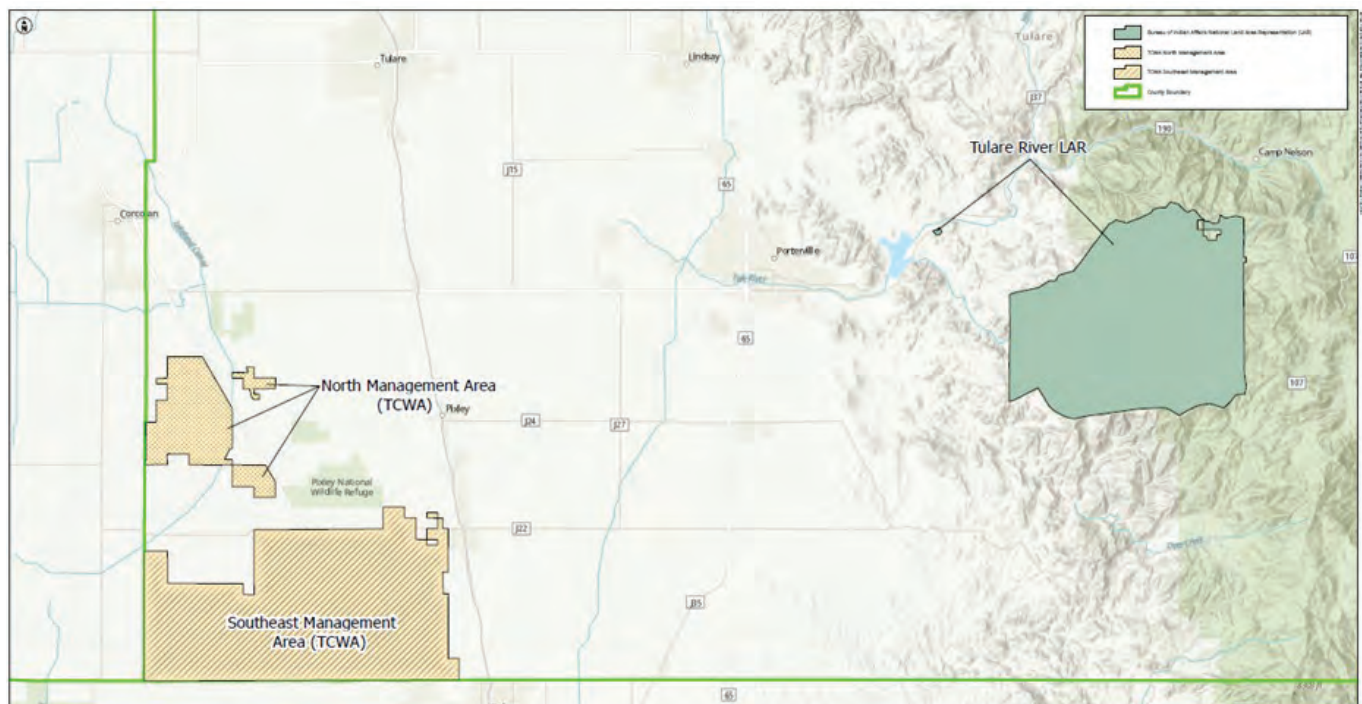
²⁰ California's Fourth Climate Change Assessment (Fourth Assessment) provides state-wide and regionally focused reports to help California understand and adapt to climate change as supported by dozens of state agencies, public university researchers, federal agencies and the private sector.

https://www.energy.ca.gov/sites/default/files/2022-01/CA4_CCA_SJ_Region_Eng_ada.pdf

²¹ Hydrogeological Conceptual Model and Water Budget of the Tule Subbasin prepared for the Tule Subbasin MOU Group by Thomas Harder & Co Groundwater Consulting, August 1, 2017.

https://tulesgma.com/wp-content/uploads/2018/09/tule_mou_report_final_170801_vol11.pdf

Figure 7. Historic Indian Lands Near TCWA Service Area



Does the proposed project support Tribal led conservation and restoration priorities, and/or incorporate or benefit indigenous traditional knowledge and practices?
 Water savings from this project will lead to better land and water management; the increase of water to the groundwater aquifers which will lead to ecological benefits in Tulare Lake, Tule River, and Deer Creek.

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, increased renewable energy, or economic growth opportunities? Does the proposed project support Reclamation's Tribal trust responsibilities or a Reclamation activity with a Tribe?

Metered wells will allow for more precise groundwater withdrawals and will provide a small buffer of resiliency against possible mandated water quantity restrictions due to climate change and drought. Efficient delivery systems will lead to additional water in the aquifers and in the rivers for Tribes downstream.

Criterion E—Complementing On-Farm Irrigation Improvements (8 points)

Up to **8 points** may be awarded for projects that describe in detail how they will complement on-farm irrigation improvements eligible for NRCS financial or technical assistance.

Note: Scoring under this criterion is based on an overall assessment of the extent to which the WaterSMART Grant project will complement ongoing or future on-farm improvements. Applicants should describe any proposal made to NRCS, or any plans to seek assistance from NRCS in the future, and how an NRCS-assisted activity would complement the WaterSMART Grant project. Financial assistance through EQIP is the most commonly used program by which NRCS helps producers implement improvements to irrigation systems, but NRCS does have additional technical or financial assistance

²OMB, CEQ, & CPO, M-23-09, Addendum to the Interim Implementation Guidance for the Justice40 Initiative, M-21-28, on using the Climate and Economic Justice Screening Tool (CEJST) (Jan. 27, 2023), www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf.

Complementing on-farm irrigation improvements, though expected, have not been detailed at this time.

Criterion F—Readiness to Proceed (8 points)

Up to **8 points** may be awarded for this criterion.

Points may be awarded based upon the extent to which the proposed project is capable of commencing upon entering into a financial assistance agreement. ***Note: If your project is selected, responses provided in this section will be used to develop the scope of work that will be included in the financial assistance agreement.***

Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- Identify and provide a summary description of the major tasks necessary to complete the project. ***Note: 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.***

The project will equip the TCWA well stations with flow equipment to accurately document groundwater pumpage. Flow meter manufacturers and local vendors have already been contacted to document flow meters options. A short list of flow meter equipment was prioritized based on criteria developed for the project to meet the needs of the project (see Flow Meter Evaluation in Attachment A). This included the cost, type of meter, and installation requirements for example. Assuming the grant is awarded to TCWA, the project will start with public outreach and the development of a master well database to document the as-built conditions for selecting the best flow meter option. The master database will include information such as the address or latitude and longitude, owner, and the piping materials and sizes. TCWA will reach out to local vendors to request quotes for the flow meter procurement and installation. The quotes will be based on the information documented in the master well database.

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

No permits are required to equip the well stations with flow meters.

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

Engineering design work is not needed for the meter installation. Appropriate equipment that meets the project specification shall be selected by the well owner, and a contractor shall be scheduled to install the meter. There is minimal construction. Ideally a saddle-insertion style flow meter is selected to minimize the installation effort; however, if a flange meter is selected, piping modifications may be needed, which can be designed and constructed by the contractor on the day of the installation.

TCWA completed a technical memorandum to identify the criteria important for selecting a flow meter. Several vendors and manufacturers were contacted to document the specifics of the available meters. It was determined that the important criteria includes: cost so that the available funds are used as best as possible to equip all TCWA well stations; measurement of instantaneous flow rate and total pumpage to document groundwater extraction and begin reducing the pumpage to achieve SGMA goals; the equipment shall be battery powered to ensure it can be used at any location and not dependent on external power; an integrated, all-in-one flow meter and telemetry unit is preferred for simplicity; however, most units allow for third party components; installation requirements that reduce the required upstream and downstream straight run pipe so that pipe modifications are not needed; and, a cloud database that is an application programming interface for receiving signals from a multiple flow meters that may be different manufacturers and models, and this ensures the database has the ability to send the data to TCWA's local computer or a third-party. These criteria reduce the number of potential flow meters to ensure the project is successful at accurately documenting the groundwater pumpage.

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

After the installation of the flow meter equipment, the TCWA Board will implement a monthly inventory of the pumped groundwater. The flow meter equipment will

report the total pumpage each month. Any flow meter that does not report the total pumpage will require a site visit by TCWA to troubleshoot and correct.

Describe the current design status of the project. If additional design work is required prior to construction, describe the planned process and timeline for completing the design work.

The project does not have any design 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?

The proposed schedule with completion date is the following:

- **BOR notifies TCWA if WaterSMART Grant is selected: May 2025.**
Following selection announcement and contracting, Reclamation's anticipates October 2025 to be the notice to proceed/when Reclamation funding is eligible to be used for the metering project
- **Public Outreach: June through September 2025.** TCWA will contact the well owners to notify them of the meter project and the pending available grant funds. Due to the urgent nature and need for the metering project, TCWA proposes to begin metering project steps following grant selection and ahead of award funding being available (October 2025), with the understanding TCWA will use its non-federal funding for project work in anticipation of pre-award eligibility. This effort will include meetings, phone calls, and emails between the TCWA board members and the well owners. The public outreach will notify the public and collect information on the well station, such as the well location and piping diameter. This information will be documented in a database.
- **Well Database Development: August – October 2025.** TCWA will develop a database of the well information. The master well database will be developed starting in August through October 2025 after the public outreach period. The information will allow TCWA to develop an accurate cost for each well meter installation.
- **Vendor/Installer Procurement: October 2025 – January 2026.** Finalize Reclamation contracting, followed by requesting bids from local vendors / installers from November 2025 through January 2026. TCWA will contact local vendors for quotes to purchase and install equipment at each well station based on its as-built condition. This will require emailing and phone calls with the vendors, and possible site visits to the well stations.

- **February 2026: TCWA Board Vendor Approval.** Once TCWA has received vendor quotes for all well stations, the board will review and discuss, and then vote to approve the meter project.
- **February 2026 – August 2026. Install 50% of Meters.** Install equipment at a minimum of 50% well stations by August 2026. Vendors have six (6) months to install 50% of the meters.
- **August 2026 – February 2027: Install 100% of Meters.** Install equipment at 100% well stations by February 2027. Vendors have another six (6) months to install the remaining 50% of the meters and thus completing 100% of the project.
- **March 2027 – May 2027: Meter Field Verification.** TCWA will visit all well stations for field verification of the flow meters. Field verifying and documentation of the installed equipment will start in March through May 2027. The field verification includes, but it is not limited to documenting with field pictures, documenting the installed meter model and serial numbers, verifying the meter was installed according to the manufacturer’s requirements, verifying the meter is recording instantaneous flow rate and total pumpage.
- **June 2027 – October 2027: Annual Report and BasinSafe Integration.** Following meter installations are verified. BasinSafe will be updated to download the metered data from the cloud and telemetry units. The annual reporting of groundwater savings will be calculated and tracked in BasinSafe. This task is expected to start in June 2027 through October 2027. The summer of 2027 will be the first irrigation season when all of TCWA’s well stations are equipped with flow meters.

Criterion G—Collaboration (5 points)

Up to 5 points may be awarded for projects that promote and encourage collaboration among parties in a way that helps increase the sustainability of the water supply.

Please describe how the project promotes and encourages collaboration. Consider the following:

- *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?*
- *What is the significance of the collaboration/support?*
- *Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*
- *Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?*

•Please attach any relevant supporting documents (e.g., letters of support memorandum of understanding).

This project has significant support from TCWA service members, community partners, and both local, state, federal, and tribal agencies in the area. See the letters of support attached (Attachment C). This project is anticipated to enhance conservation approaches by giving agricultural well users accurate data to understand their annual groundwater use. The BasinSafe software application has a dashboard user interface, which organizes both real-time and historical water use data for each well owner to access. This is anticipated to enhance broader comprehension of groundwater conservation principles in the TCWA service area.

Criterion H—Nexus to Reclamation (4 points)

Up to 4 points may be awarded if the proposed project is connected to a Reclamation project or Reclamation activity. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

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?

TCWA includes two members that are contractors or subcontractors of Reclamation via the Central Valley Project's (CVP) Cross Valley Canal and the Delta-Mendota Canal:

1. Angiola Water District/Fresno Slough Water District (Mendota) and
2. Atwell Island Water District (CVC)— as a subcontractor under Tulare County's contract.

If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?

NA

• Will the proposed work benefit a Reclamation project area or activity?

The Atwell Island Project (AIP) is an 8,000 acre project to restore retired farmland to valley grassland and alkalai sink habitat that Reclamation served as the Lead Agency for. AIP is managed by the Bureau of Land Management and created through the Central Valley Project Improvement Act (CVPIA) of 1992. The project is located within the Study Area within the TCWA service area. The project was co-managed with the US Fish and Wildlife Service and includes the 630-acre Ton Tachi wetlands, a Wetland Reserve Easement with the USDA NRCS.

TCWA has entered into a Memorandum of Understanding (MOU) with BLM (who is exempt from SGMA as a Federal Agency) to collaborate on groundwater management on the AIP and support the Ton Tachi wetlands. Under this novel partnership, TCWA treats BLM like any other landowner in terms of groundwater allocation and tracking (i.e. BLM has an account in BasinSafe).

The Ton Tachi wetlands are managed for endangered species -Tri Colored Blackbirds and Buena Vista Lake Shrew, migratory birds, and other native wildlife. The California-Great Basin Region of Reclamation has continued to fund studies and acquisition projects on the AIP under the CVPIA Habitat and Conservations Programs.

Improved groundwater management through the installation of meters and associated groundwater conservation through this project will provide benefits to these and other public lands in the project area.

• *Is the applicant a Tribe?*

The Tachi Yokut tribe from the Santa Rosa Rancheria highly value Ton Tachi wetland for the collection of baskets weaving materials and for ceremonial purposes and have provided a letter of support for this grant (attached) due to the additional benefit to groundwater management that the project will provide.

1.6 Performance Measures

Provide a brief summary describing the performance measure 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.

*All Water and Energy Efficiency Grants applicants are **required** to propose a “performance measure” (a method of quantifying the actual benefits of their project once it is completed). A provision will be included in all assistance agreements with Water and Energy Efficiency Grants recipients describing the performance measure and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project. If information regarding project benefits is not available immediately upon completion of the project, the financial assistance agreement may be modified to remain open until such information is available and until a Final Report is submitted. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of Water and Energy Efficiency Grants.*

Note: Program funding may be used to install necessary equipment to monitor progress. However, program funding may not be used to measure performance after project construction is complete (these costs are considered normal operation and maintenance costs and are the responsibility of the applicant).

Performance of the project will be measured by comparing the annual metered water use (post project) to the estimated annual water use (pre-project). Pre-project water use methods (ET estimates) will be continued both as a backup to the metering system, to provide valuable information to growers about estimated water demand across their fields, and to serve as the baseline for comparison and calculation of the water saved by the project. The following sections detail the performance measures for this project.

Pre-project baseline performance measure (Baseline): Annual groundwater pumping using LandIQ ET estimates as tracked and quantified in BasinSafe system.

Post-project performance measure (Metered): Annual groundwater pumping using measured/metered pumping from the 72 installed telemetry enabled meters.

Project performance (Baseline – Metered): Direct water savings as calculated by subtracting the metered (measured) pumping value from the estimated ET derived pumping value.

Performance measures will be determined as part of the current annual reporting and SGMA compliance that TCWA already performs.

Additional specific performance measures include:

Performance Measure A.2: Measuring Devices: Good water management requires accurate and timely water measurement at appropriate locations throughout a conveyance system. This includes irrigation delivery systems and municipal distribution systems.

Measuring Devices: A.2.b. Irrigation Metering. Measuring devices that may be installed can include, but is not limited to, the following:

Flow meters: Water Conservation will be achieved and quantified with the installation of permanently installed irrigation flow meters with telemetry. A key metric of this proposal will be the objective to install TCWA metered telemetry stations on large capacity irrigation wells in TCWA.

Potential benefits from improved irrigation delivery system measurement include being able to:

- *Facilitate accurate and equitable distribution of water within a district.*

For irrigation optimization, SGMA compliance, and minimization of disturbance to local economies and communities, accurate measurement of water pumped is necessary to ensure compliance with pumping allocations, to facilitate management strategies like water banking, and to be able to more timely respond to changing conditions. Permanently installed totalizing flow meters with telemetry will facilitate accurate and equitable groundwater measurement in TCWA under this proposal.

Pre-project estimations of baseline data:

TCWA wells are not metered. Consequently, water use projections are estimates based on evapotranspiration. The installation of permanently installed totalizing flow meters will provide the most accurate measurement of irrigation water use in the district and facilitate water conservation.

Post-project methods for quantifying the benefits of projects to install measuring devices:

- *Present how measurement devices were used to identify water losses which were previously unknown and how these will be addressed.*

At the conclusion of this project, all groundwater extractions will be metered with real-time telemetry. Once this goal has been accomplished, accurate and reliable measurements of water use will be available to water users as well as the district. Flow meter readings will be used to improve the management of irrigation water to reduce or eliminate water losses including runoff and deep percolation, which are considered non-beneficial uses, and achieve groundwater sustainability by 2040. Meters will also provide the basis for verifiable water conservation once this project has been implemented.

Performance Measure A.3: SCADA: *SCADA systems provide water managers with real-time data on the flow rates and volumes of water at key points within an irrigation water delivery system. **The projected opportunities for improved operational efficiencies that could be realized through implementation of a SCADA:***

SCADA or Real-time telemetry benefits for groundwater extractions will be as follows:

- Real-time telemetry will make instantaneous meter reading and on-demand volume tracking available in the TCWA.
 - Real-time telemetry will enable irrigators to track water use daily and more accurately match water applications to local environmental conditions from weather stations in TCWA for improved Irrigation Water Management and programs like IMO.
 - Groundwater extraction data will be available on-demand to TCWA water managers and water users which would have been impossible without the use of telemetry for remote reading of irrigation flowmeters.

Pre-project estimations of baseline data:

- *Collect data on diversions and deliveries to water users*

Data on previous groundwater extractions are based on estimates of evapotranspiration and observed rainfall which results in estimated crop water demand on a field scale basis. This information is modeled monthly and made available via the BasinSafe online groundwater account system.

Post-project methods for quantifying benefits of SCADA or SCADA/GIS system projects:

- *Calculate amount of increased carryover storage in associated reservoirs. This is a long term measure which will be more meaningful over a period of years.*

Once the 72 metered telemetry stations have been installed, accurate and reliable measurements of water use will be possible. The proposed project will provide valuable metered groundwater extraction data daily to TCWA as well as irrigators for advanced irrigation water management. Water conserved will remain in the reservoir that is the local aquifer to support sustainability for all uses in TCWA.

Estimates for increased storage in the local aquifer over a ten-year period are:

- Direct Water Savings from Improved Irrigation Management: 5,840 AF per year

- Annual Positive Affect on the Aquifer: 5,840 AF
- Ten Year Aquifer Affect: + 58,400 AF or 15.4% of the approximate 380,000 AF Overdraft (total 10-year based on current annual conditions) in the TCWA service area.

This does not include estimated indirect water savings which could match or exceed the direct water savings provided by the metering project.

1.7 Environmental and Cultural Resources Compliance

Will the proposed Project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)?

Work proposed under this WaterSmart grant will have no significant impact on the surrounding environment. All earth disturbing work will occur on existing well sites and easements.

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 area? If so, would they be affected by any activities associated with the proposed Project?

No, there are no anticipated impacts to any species from this project.

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

There are three major surface waters inside the project boundaries that fall under the Clean Water Act jurisdiction – Tule River, Deer Creek, and Homeland Canal. There are no negative impacts anticipated to any of these and only positive anticipated impacts expected from more groundwater recharge available to hydraulically connected surface water flows from reduced groundwater pumping.

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

Yes, the intention of this work proposed under this WaterSmart Grant is to add meters to approximately 70 agricultural wells to help provide inside into more efficient water system practices.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?

Allensworth is a historic community located in Tulare County and within the project site, is known to be the first community founded, financed, and governed by African Americans in California. However, there are no anticipated impacts to any of these historic buildings or structures from this project as the work will occur on existing easements. The Allensworth Community Services District has provided a letter of support for this project.

Archeological Sites

There are/are no archeological sites located in the project area.

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

There are no disproportionately high or adverse effects on low income or minority populations. It is anticipated that this project will positively affect these populations.

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

No work will limit access to Indian Sacred Sites of Tribal Lands. The nearby Yokut Tribe has provided a letter of support for TCWA's proposed grant (attached)

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?

This project will not contribute to the introduction or spread of noxious weeds or other non-native invasive species to the area.

1.8 Overlap or Duplication of Effort Statement

The activities proposed under this WaterSmart grant do not duplicate or overlap existing water metering efforts by TCWA.

1.9 Conflict of Interest Disclosure Statement

There are no known conflicts of interest for TCWA's proposed project. As required in the NOFO, the TCWA will submit a conflict-of-interest disclosure or certification statement prior to issue of an award.

1.10 Required Permits or Approvals

No permits are required to equip the well stations with flow meters.

2 Project Budget

The total cost of this proposal is \$1,036,145. Of this total cost, TCWA is prepared to provide more than 50% match, equivalent to \$550,145. This would take the form of \$122,475 of in-kind contribution in the form of salaries, wages, and fringe benefits of staff working on outreach, scope of work, and project management. Additionally, TCWA will provide \$427,670 in cash contributions towards other project costs.

Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT	PERCENT CONTRIBUTION
Non-Federal Entities		
1. TCWA	\$550,145	
<i>Non-Federal Subtotal</i>	\$550,145	51.5%
Other Federal Entities		
1. Not Applicable	\$0	
<i>Other Federal Subtotal</i>	\$0	
Requested Reclamation Funding	\$486,000	48.5%
Total Budget	\$1,036,145	100%

2.1.1 Budget Proposal

The Budget Proposal table below details the budget of this proposal, including work completed by TCWA staff and work provided by TCWA water supply consultants.



United States Department of the Interior



BUREAU OF LAND MANAGEMENT
Bakersfield Field Office
35126 McMurtrey Ave.
Bakersfield, CA 93308
www.blm.gov/office/bakersfield-field-office

November 7, 2024

RE: Support for Tri-County Water Authority WaterSMART Water and Energy Efficiency Grant Funding for Meter Installation

Dear U.S. Bureau of Reclamation WaterSMART Selection Committee,

Bureau of Land Management, Bakersfield Field Office writes to express our support of Tri-County Water Authority's (TCWA) Water and Energy Efficiency Grant (WEEG) application, which seeks to fund meter installation for up to 200 of TCWA members' groundwater wells used for agricultural supply. We see TCWA's metering program as a critical, proactive step to help conserve limited groundwater supply in the Tule and Tulare Lake subbasins located in the Tulare Lake region of California's San Joaquin Valley and meet state-mandated groundwater sustainability goals by 2040 – therefore reducing groundwater “overdraft” (e.g., over-pumping) and associated subsidence and water quality concerns.

TCWA adopted one of the first well metering programs in the region in 2020 and adopted a water budget with allocations and pumping limits in 2021. In light of recent action by California's State Water Resource Control Board to put the Tulare Lake and Tule Subbasins on probation, TCWA's foresight to prioritize installing consistent precision metering devices on all agricultural groundwater wells is justified. Accurate metered data will deliver clarity on the volume of groundwater extracted and create flexibility for TCWA to respond nimbly to changing water supply conditions.

TCWA has groundwater regulatory authority over 117,247 acres in the Tulare Lake and Tule Subbasin, serving multiple groundwater users on predominantly agricultural lands. The TCWA service area includes the Allensworth community, a historically African-American community (California's first town founded and governed by black settlers) that farms over 1,000 acres within TCWA's boundary and has a community of approximately 450 persons.

TCWA is in two critically over drafted basins that must eliminate groundwater overdraft by 2040, per the Sustainable Groundwater Management Act (SGMA) mandate. Since the late 1980s, groundwater levels within TCWA's service area have been declining because of both over-pumping and more frequent drought conditions that lessen groundwater recharge to the region's shallow and deep aquifers. As just one look into the severity of the project area's water supply conditions, it's estimated that nearly 12,000 acres (up to half of TCWA active farmland) will be retired from production during SGMA's implementation if groundwater management improvements are not taken. TCWA's growers generate an estimated \$165M in annual agricultural revenue. Despite this regional economic power, the water scenario is precarious and demands action.

INTERIOR REGIONS 8 & 10 • LOWER COLORADO BASIN & CALIFORNIA-GREAT BASIN

ARIZONA, CALIFORNIA, NEVADA, OREGON*

* PARTIAL

In closing, TCWA’s effort to use consistent metering will both enhance water conservation savings and allow water managers to better understand overdraft areas. The goal of a SGMA compliant monitoring network is vital to managing groundwater extraction responsibility, making water supplies more drought resilient in anticipation of the new “normal” of recurring water-short years in the basin, and sustaining the region’s agricultural industry – which is essential to the region, state, and the nation.

Sincerely,

JOHN HODGE

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HODGE
Date: 2024.11.07 10:57:37
-08'00'

Gabriel Garcia

Field Manager



October 25, 2024

RE: Support for Tri-County Water Authority WaterSMART Water and Energy Efficiency Grant Funding for Meter Installation

Dear U.S. Bureau of Reclamation WaterSMART Selection Committee,

Allensworth Community Services District writes to express our support of Tri-County Water Authority's (TCWA) Water and Energy Efficiency Grant (WEEG) application, which seeks to fund meter installation for up to 200 of TCWA members' groundwater wells used for agricultural supply. We see TCWA's metering program as a critical, proactive step to help conserve limited groundwater supply in the Tule and Tulare Lake subbasins located in the Tulare Lake region of California's San Joaquin Valley and meet state-mandated groundwater sustainability goals by 2040 – therefore reducing groundwater "overdraft" (e.g., over-pumping) and associated subsidence and water quality concerns.

TCWA adopted one of the first well metering programs in the region in 2020 and adopted a water budget with allocations and pumping limits in 2021. In light of recent action by California's State Water Resource Control Board to put the Tulare Lake and Tule Subbasins on probation, TCWA's foresight to prioritize installing consistent precision metering devices on all agricultural groundwater wells is justified. Accurate metered data will deliver clarity on the volume of groundwater extracted and create flexibility for TCWA to respond nimbly to changing water supply conditions.

TCWA has groundwater regulatory authority over 117,247 acres in the Tulare Lake and Tule Subbasin, serving multiple groundwater users on predominantly agricultural lands. The TCWA service area includes the Allensworth community, a historically African-American community (California's first town founded and governed by black settlers) that farms over 1,000 acres within TCWA's boundary and has a community of approximately 450 persons.

TCWA is located in two critically overdrafted basins that must eliminate groundwater overdraft by 2040, per the Sustainable Groundwater Management Act (SGMA) mandate. Since the late 1980s, groundwater levels within TCWA's service area have been declining because of both over-pumping and more frequent drought conditions that lessen groundwater recharge to the region's shallow and deep aquifers. As just one look into the severity of the project area's water supply conditions, it's estimated that nearly 12,000 acres (up to half of TCWA active farmland) will be retired from production during SGMA's implementation if groundwater management improvements are not taken. TCWA's growers generate an estimated \$165M in annual agricultural revenue. Despite this regional economic power, the water scenario is precarious and demands action.

In closing, TCWA's effort to use consistent metering will both enhance water conservation savings and allow water managers to better understand overdraft areas. The goal of a SGMA compliant monitoring network is vital to managing groundwater extraction responsibility, making water supplies more drought resilient in anticipation of the new "normal" of recurring water-short years in the basin, and sustaining the region's agricultural industry – which is essential to the region, state, and the nation.

Sincerely,

Henry Hunter

SANTA ROSA RANCHERIA TACHI YOKUT TRIBE

Leo J. Sisco
Chairman

Robert Jeff II
Vice Chairman

Candida L. Cuara
Secretary

Rosa Hernandez
Treasurer

Bryce Baga/Jaime Pimentel
Delegates

November 07, 2024

RE: Support for Tri-County Water Authority WaterSMART Water and Energy Efficiency Grant Funding for Meter Installation

Dear U.S. Bureau of Reclamation WaterSMART Selection Committee,

The Santa Rosa Rancheria, Tachi Yokuts Tribe, writes to express our support of Tri-County Water Authority's (TCWA) Water and Energy Efficiency Grant (WEEG) application, which seeks to fund meter installation for up to 200 of TCWA members' groundwater wells used for agricultural supply. We see TCWA's metering program as a critical, proactive step to help conserve limited groundwater supply in the Tule and Tulare Lake subbasins located in the Tulare Lake region of California's San Joaquin Valley and meet state-mandated groundwater sustainability goals by 2040 – therefore reducing groundwater "overdraft" (e.g., over-pumping) and associated subsidence and water quality concerns.

TCWA adopted one of the first well metering programs in the region in 2020 and adopted a water budget with allocations and pumping limits in 2021. In light of recent action by California's State Water Resource Control Board to put the Tulare Lake and Tule Subbasins on probation, TCWA's foresight to prioritize installing consistent precision metering devices on all agricultural groundwater wells is justified. Accurate metered data will deliver clarity on the volume of groundwater extracted and create flexibility for TCWA to respond nimbly to changing water supply conditions.

TCWA has groundwater regulatory authority over 117,247 acres in the Tulare Lake and Tule Subbasin, serving multiple groundwater users on predominantly agricultural lands. The TCWA service area includes the Allensworth community, a historically African-American community (California's first town founded and governed by black settlers) that farms over 1,000 acres within TCWA's boundary and has a community of approximately 450 persons.

TCWA is located in two critically overdrafted basins that must eliminate groundwater overdraft by 2040, per the Sustainable Groundwater Management Act (SGMA) mandate. Since the late 1980s, groundwater levels within TCWA's service area have been declining because of both over-pumping and more frequent drought conditions that lessen groundwater recharge to the region's shallow and deep aquifers. As just one look into the severity of the project area's water supply conditions, it's estimated that nearly 12,000 acres (up to half of TCWA active farmland) will be retired from production during SGMA's implementation if groundwater management improvements are not taken. TCWA's growers generate an estimated \$165M in annual agricultural revenue. Despite this regional economic power, the water scenario is precarious and demands action.

In closing, TCWA's effort to use consistent metering will both enhance water conservation savings and allow water managers to better understand overdraft areas. The goal of a SGMA compliant monitoring network is vital to managing groundwater extraction responsibility, making water supplies more drought resilient in anticipation of the new "normal" of recurring water-short years in the basin, and sustaining the region's agricultural industry – which is essential to the region, state, and the nation.

Sincerely,



Robert Jeff - Vice Chairman



UNITED STATES
HOUSE OF REPRESENTATIVES

COMMITTEE ON APPROPRIATIONS

SUBCOMMITTEE ON LEGISLATIVE BRANCH
CHAIRMAN

SUBCOMMITTEE ON AGRICULTURE, RURAL
DEVELOPMENT, FOOD AND DRUG
ADMINISTRATION

SUBCOMMITTEE ON MILITARY CONSTRUCTION,
VETERANS' AFFAIRS AND RELATED AGENCIES

SUBCOMMITTEE ON TRANSPORTATION, HOUSING,
AND URBAN DEVELOPMENT, AND RELATED
AGENCIES

COMMITTEE ON BUDGET

October 31, 2024

The Honorable Camille Calimlim Touton
Bureau of Reclamation
1849 C Street NW
Washington, DC 20240-0001

Dear Commissioner Touton,

I am writing to express my strong support for Tri-County Water Authority's (TCWA) application to the Water and Energy Efficiency Grant (WEEG). If funded, TCWA will install up to 200 water meters for groundwater wells used for agricultural supply. TCWA is taking a proactive step to help conserve groundwater supply in the Tule and Tulare Lake subbasin by replacing old, outdated meters. Additionally, landowners who have not added meters due to cost concerns will have an opportunity to install them through this grant.

Due to over pumping, drought conditions, reductions in surface water deliveries, and the Sustainable Groundwater Management Act (SGMA) mandate, it is estimated that nearly 12,000 acres (half of TCWA's active farmland) will be retired from production during SGMA's implementation, if groundwater management improvement are not taken.

TCWA is well equipped to support this project's goal of enhancing water conservation savings, allowing water managers to better understand overdraft areas, and sustaining the region's agricultural industry. I respectfully ask for your full and fair consideration of their application to the Water and Energy Efficiency Grant. Thank you for your time and attention to this matter.

Sincerely,

David G. Valadao
Member of Congress



Tule Basin

LAND & WATER CONSERVATION TRUST

October 28, 2024

RE: Support for Tri-County Water Authority WaterSMART Water and Energy Efficiency Grant Funding for Meter Installation

Dear U.S. Bureau of Reclamation WaterSMART Selection Committee,

The Tule Basin Land and Water Conservation Trust is writing to express our strong support for Tri-County Water Authority's (TCWA) application for the Water and Energy Efficiency Grant (WEEG) to fund the installation of meters for up to 200 groundwater wells utilized by TCWA members for agricultural supply. We view TCWA's metering initiative as an essential and proactive measure to conserve the limited groundwater resources in the Tule and Tulare Lake subbasins of California's San Joaquin Valley, and to meet the state-mandated groundwater sustainability goals by 2040. This initiative is crucial for addressing groundwater overdraft, which leads to subsidence and deteriorating water quality.

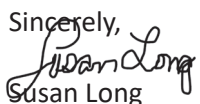
Since its inception of one of the region's first well metering programs in 2020, TCWA has demonstrated leadership in groundwater management by implementing a water budget with allocations and pumping limits in 2021. Given the recent decision by California's State Water Resource Control Board to place the Tulare Lake and Tule subbasins on probation, TCWA's commitment to installing precise metering devices on all agricultural groundwater wells is both timely and necessary. Accurate metering will provide vital data on groundwater extraction, enabling TCWA to respond effectively to fluctuating water supply conditions.

TCWA oversees groundwater resources across 117,247 acres in the Tulare Lake and Tule Subbasin, serving numerous agricultural users. Among these, the Allensworth community—a historically African American settlement that was the first town founded and governed by Black settlers in California—farms over 1,000 acres within TCWA's district, supporting a population of approximately 450 residents.

Considering the Sustainable Groundwater Management Act (SGMA), TCWA operates within two critically over-drafted basins that must eliminate groundwater overdraft by 2040. Groundwater levels in the area have been in decline since the late 1980s due to over-pumping and increasingly frequent droughts that hinder groundwater recharge. Without effective groundwater management, it is projected that up to 12,000 acres—half of TCWA's active farmland—may be retired from production during SGMA implementation. This would have severe economic repercussions, as TCWA's agricultural growers generate an estimated \$165 million in annual revenue.

In conclusion, TCWA's commitment to consistent metering will significantly enhance water conservation efforts and enable better management of overdraft areas. Establishing a compliant monitoring network is essential for responsible groundwater extraction, improving drought resilience, and sustaining the agricultural sector that is vital to our region, state, and nation.

Thank you for considering this critical initiative.

Sincerely,

Susan Long
Executive Director
Tule Basin Land and Water Conservation Trust



4500 S. Laspina Street/ P.O. BOX 459, Tulare, CA 93274



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COUNTY OF TULARE

BOARD OF SUPERVISORS

PETE VANDER POEL
DISTRICT 2

November 6, 2024

Camille Calimlim Touton
Commissioner
Bureau of Reclamation
1849 C Street NW
Washington, DC 20240-0001

RE: Support for Tri-County Water Authority WaterSMART Water and Energy Efficiency Grant Funding for Meter Installation

To Whom It May Concern:

As the Tulare County Supervisor for District 2, I am writing to express my support for the Tri-County Water Authority's (TCWA) Water and Energy Efficiency Grant (WEEG) application. WEEG seeks to fund meter installation for up to 200 TCWA members' groundwater wells, used for agricultural supply. TCWA's metering program is a critical and proactive step toward helping to conserve the limited groundwater supply in the Tule and Tulare Lake subbasins, located in the Tulare Lake region of California's San Joaquin Valley. It will also assist in meeting state-mandated groundwater sustainability goals by 2040 – therefore reducing groundwater “overdraft” (e.g., over-pumping) and associated subsidence and water quality concerns.

The TCWA has groundwater regulatory authority over 117,247 acres in the Tulare Lake and Tule Subbasin, serving multiple groundwater users on predominantly agricultural lands. The TCWA service area includes the Allensworth community, a historically African American community (California's first town founded and governed by black settlers) that farms over 1,000 acres within TCWA's boundary and has a community of approximately 450 persons.

TCWA is located within two critically over-drafted basins that must eliminate groundwater overdraft by 2040, per the Sustainable Groundwater Management Act (SGMA) mandate. When looking into the severity of the project area's water supply conditions, it's estimated that nearly 12,000 acres (up to half of TCWA active farmland) will be retired from production during SGMA's implementation if groundwater management improvements are not taken. TCWA's growers generate an estimated \$165M in annual agricultural revenue. Despite this regional economic power, the water scenario is precarious and demands action.

I applaud and fully support TCWA's effort to use consistent metering while enhancing water conservation savings and allowing water managers to better understand overdraft areas. The goal of an SGMA-compliant monitoring network is vital to managing groundwater extraction responsibility, making water supplies more drought resilient in anticipation of the “new normal” of recurring dry years in the basin, and sustaining the region's agricultural industry – which is essential to the region, state, and the nation.

Sincerely,

Pete Vander Poel, District 2 Supervisor
Tulare County Board of Supervisors

MILK PRODUCERS COUNCIL

Serving the Dairy Industry for More Than 70 Years



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Director of Regulatory & Economic Affairs

Betsy Hunter-Binns
Southern CA & Central Valley Representative

John Huitsing
Controller

Pat Boldt
Environmental Specialist

October 29, 2024

RE: Support for Tri-County Water Authority WaterSMART Water and Energy Efficiency Grant Funding for Meter Installation

Dear U.S. Bureau of Reclamation WaterSMART Selection Committee,

Milk Producers Council is a dairy farmer trade association that since 1949 has represented our member dairy families in local, state and federal issues. We strongly support Tri-County Water Authority's (TCWA) Water and Energy Efficiency Grant (WEEG) application, which seeks to provide meter installation funding assistance for agriculture groundwater wells.

TCWA is located in two critically overdrafted basins that must eliminate groundwater overdraft by 2040, per the Sustainable Groundwater Management Act (SGMA) mandate. Since the late 1980s, groundwater levels within TCWA's service area have been declining because of both over-pumping and more frequent drought conditions that lessen groundwater recharge to the region's shallow and deep aquifers.

It is estimated that nearly 12,000 acres (up to half of TCWA active farmland) will be retired from production between now and 2040 if groundwater management improvements are not taken. TCWA has groundwater regulatory authority over 117,247 acres in the Tulare Lake and Tule Subbasin, serving multiple groundwater users on predominantly agricultural lands. In addition, the TCWA service area includes the Allensworth community, a historically African-American community (California's first town founded and governed by black settlers) that farms over 1,000 acres within TCWA's boundary and has a community of approximately 450 persons.

TCWA's effort to use consistent metering will both enhance water conservation savings and allow water managers to better understand overdraft areas. The goal of a SGMA compliant monitoring network is vital to managing groundwater extraction responsibility, making water supplies more drought resilient in anticipation of the new "normal" of recurring water-short years in the basin, and sustaining the region's agricultural industry – which is essential to the region, state, and the nation. Milk Producers Council urges a favorable response by the Bureau to the TCWA WEEG application.

Sincerely,

Kevin Abernathy
General Manager