

Northeast Colorado Augmentation SCADA Efficiency Project

WaterSMART Small-Scale Water Efficiency
Grant Application NOFO# R22AS00195



Applicant: Central Colorado Water Conservancy District

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TECHNICAL PROPOSAL AND EVALUATION CRITERIA

Executive Summary

The Central Colorado Water Conservancy District (“Central” or ‘District’), and its two Subdistricts, the Groundwater Management Subdistrict (“GMS”) and Well Augmentation Subdistrict (“WAS”)¹ are located in Northeastern Colorado in Weld, Morgan and Adams Counties. Agricultural producers in Weld, Morgan and Adams Counties contribute over \$3.0 billion annually to Colorado’s economy. Central is a “Category A” applicant for the purposes of this NOFO. Central’s water management strategy is to increase water use efficiency of irrigation wells within the South Platte Alluvial Aquifer through advanced monitoring equipment. The implementation of SCADA equipment on 150 irrigation wells will provide real-time data for the augmentation plan, eliminating waste and efficiently conserving irrigation water. Equipment installation will begin in the summer of 2022 and will be completed by summer of 2024.

Background Data

Central was formed in 1965 pursuant to the 1937 Water Conservancy Act of the State of Colorado. The District includes over 750 square miles in Adams, Weld, and Morgan Counties. District boundaries include portions of several cities, towns and numerous smaller rural communities, and approximately 210,000 acres of irrigated agricultural lands supplied by ditches and groundwater wells. Major cropping within the District consists of corn, alfalfa, grains, vegetables, turf, beets, beans, and potatoes. The District stretches along the South Platte River from Commerce City to Fort Morgan. Policy and goals are established by a fifteen-member Board of Directors who are appointed by a District Court Judge. Since its inception, the Board of Director’s goal has been to advocate for, support, and develop water resources within the South Platte River basin.

Central’s two subdistricts, GMS and WAS, operate court-decreed plans for augmentation to replace depletions caused by the pumping of approximately 1,300 alluvial groundwater wells located within the District. Currently GMS and WAS have contracts to deliver up to approximately 90,000 acre-feet per year as augmentation supplies to replace depletions caused by alluvial well pumping. These wells provide a vital water supply to irrigated lands within the District and are used by producers as either a primary source of water or to supplement irrigation supplies when yields from surface water rights are insufficient. Alluvial wells, like surface water supplies, operate within Colorado’s prior appropriation system, but water rights for wells are typically much more junior in priority.

The augmentation plans operated by GMS and WAS require protection of senior water rights, and that protection is satisfied by GMS and WAS delivering water to the river to replace depletions caused by well pumping. If sufficient replacement water is not available, then well use is curtailed

¹ Central, GMS and WAS may collectively be referred to as “Central” in this Application. GMS or WAS may be referred to individually in certain contexts.

by State water administrators. In recent years, well owners in the Central District have been curtailed by 50 – 75 percent because replacement supplies have not been sufficient.

Although the alluvial wells in GMS and WAS are tributary to the South Platte River, their pumping effects do not impact flows in the River until some amount of time after pumping. This delayed response creates complications for water administrators because of the need to protect senior water right owners. It also results in substantial inefficiencies in use of water supplies. In 2012 and 2013 for example, severe drought conditions resulted in extremely low yield from senior surface diversions, but at the same time wells were curtailed by 60 percent even though the impact of pumping occurred much later.

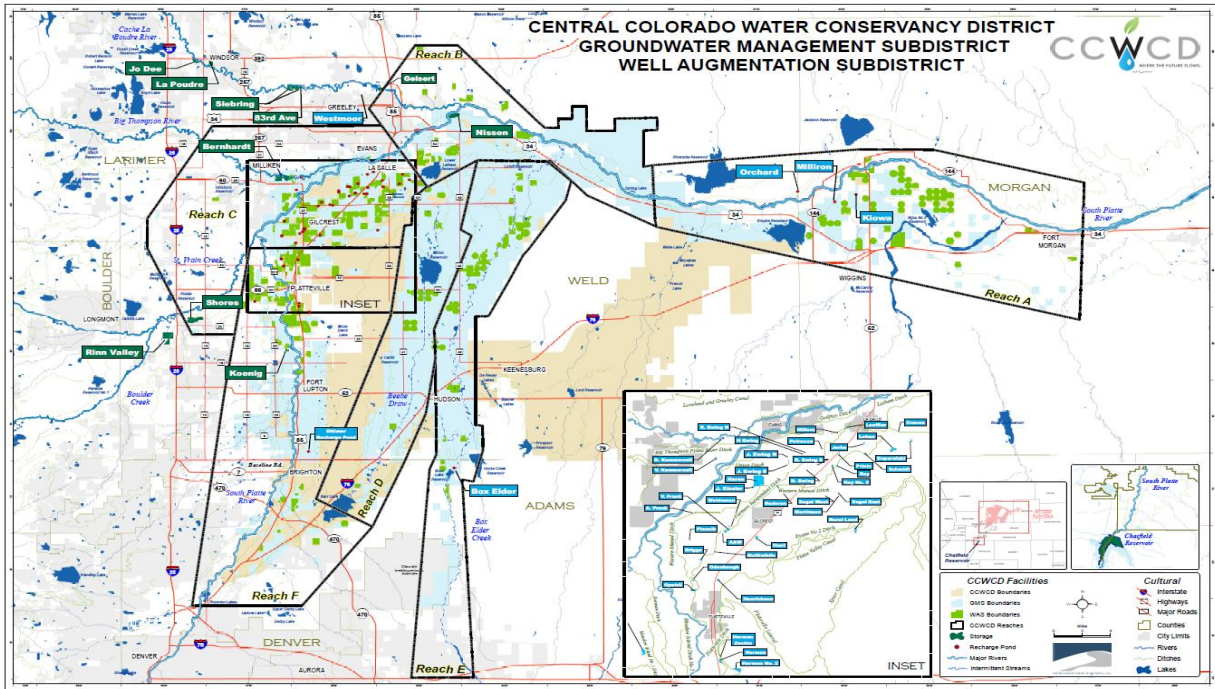
Central currently owns and operates dozens of senior water rights, storage vessels and recharge projects in the South Platte River Basin. Existing projects include senior water rights, reservoir storage projects (bentonite lined gravel pits converted to water storage after gravel mining operations), alluvial wells that pump directly back to the river, and recharge structures used to conjunctively manage Central’s replacement water supplies. The water supplies and water projects owned and operated by Central are the backbone which grant the authority for groundwater pumping on an annual basis. Available supplies and prior years pumping data are evaluated each April to determine this annual groundwater allotment, or quota as defined by Central. Market value of slurry lined gravel pits, land for recharge projects and senior water rights have been heavily influenced by the explosion of urban growth throughout much of Central’s district. The growth has created a market which is nearly infeasible for agriculture to continue to purchase senior water rights and build new storage to replace this groundwater consumption. Central’s Board of Directors has embraced a plan to create improved efficiency in the operation of the two augmentation plans because of the high cost of augmentation water.

Central has previously established a working relationship with the Bureau of Reclamation through its Water 2025 Grant Program (Assistance Agreement No. 05FC602023). The previous project enabled Central to install water meters on constituent wells, improving reporting of groundwater pumping by its approximately 1,300 alluvial wells in the South Platte River Basin. Central received funding approval for a WaterSMART Drought Response Program grant (BOR-DO-17-F010) for the Northeast Colorado Walker Recharge Project. In addition, Central received funding from the Small-Scale Water Use Efficiency Program in FY’19 (FOA# BOR-DO-19-F005) to install the first 125 telemetry units on meters for member wells in the district.

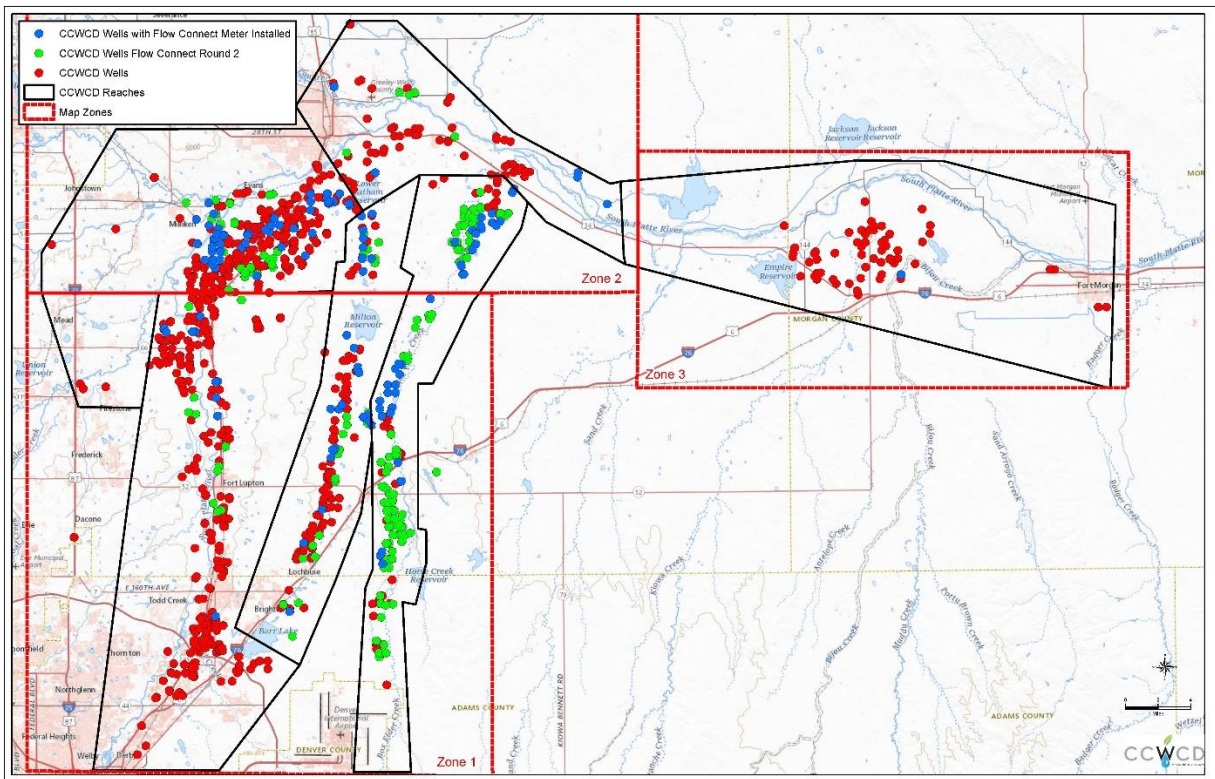
Project Location

The Central Colorado Water Conservancy District is located in Greeley, CO in Weld County. CCWCD administers augmentation plans for irrigation wells in Weld, Adams, and Morgan Counties. The 150 wells prioritized for this project are located in Western Weld and Adams Counties, Colorado as noted (in green) in the second map below.

Central, GMS, and WAS Boundaries



Targeted 150 Wells in GMS/WAS Augmentation plan for FlowConnect™



Technical Project Description and Milestones

Installing telemetry units on irrigation wells gives water resource managers and farm managers important water quantity measurements with incredible speed and accuracy. Central proposes to install 150 FlowConnect™ telemetry units, manufactured by McCrometer, Inc. The FlowConnect™ devices continually collect the total volume of water pumped from the alluvial aquifer and will be programmed to submit daily pumping data to CCWCD's servers via satellite connection. Digital data collected from these 150 irrigation wells will be processed daily and incorporated into Central's water accounting program. FlowConnect™ features a streamlined design including built-in communications for transmitting accurate, reliable irrigation flow data. This innovative design eliminates the need for external cables, pole mounting, solar panel, and other components – removing unnecessary costs and improving data quality by reducing opportunities for noise interference or cable damage.



FlowConnect also features ExactRead™ technology which ensures the flow reading on the meter's register in the field and the data remotely viewed on the web are always the same. Flow data is generated and transmitted directly from the meter register which eliminates miscommunication of raw pulse data that can lead to confusion based on poor data. With the data captured by these telemetry units, irrigators and conservation partners will be able to use irrigation flow meters as wireless data collection tools for water conservation. Water managers can help reduce water consumption, optimize irrigation water applications, ensure water reporting accuracy, and meet regulatory allocations.

The FlowConnect system provides battery-operated wireless telemetry of flow data from McCrometer propeller meters as well as data from a limited number of other sensors such as rain gages or pressure transducers. The FlowConnect system utilizes a digital register that can be mounted on the meter or remotely. This project proposes the use of digital registers which will improve the data quality of the meter readings received by the district. The FlowConnect system utilizes either cellular or satellite communication to transmit data to a web-based server where it can be accessed by the irrigator, Central staff, or district engineers for water management purposes. The graphic below demonstrates this process. The FlowConnect system is powered by either an internal (non-rechargeable) lithium battery or rechargeable batteries that can be powered by a solar panel and facilitate more frequent communications. Installing telemetry units will provide access to data feeds that help manage water resources and boost available supply through increased system efficiency.

Having the greatest accuracy when measuring aquifer pumping ensures Central is not over-replacing the depletions caused by pumping alluvial wells. With real-time groundwater pumping data the river accounting for the South Platte River will be a true representation of the groundwater consumed by Central's members, instead of estimating monthly depletions from previous years

pumping data, which is currently Central’s management option system for nearly 150 irrigation wells which impact streamflow within 30 days of pumping. Central evaluated manual reading of the 150 irrigation well meters and found the task to be infeasible due to the large geographic setting of the member irrigation wells, vehicle maintenance, fuel consumption and staff safety issues. Central has identified 150 of their 1,300 augmented irrigation wells which operate near the South Platte River or its tributaries. In addition to the close proximity to the South Platte River, these wells have some of the largest capacity in the augmentation plans and as such have the greatest impact on the South Platte River and its tributaries. Central’s staff feels confident that 150 FlowConnect™ units can be installed in the two-year time commitment described in the grant application.

In 2017, Central staff initiated a trial period and gathered data provided by five digital meters and developed the appropriate accounting and data transfer tools to make the remote meter data useful for water management. In 2019, Central added 120 digital meters with



telemetry with funding from the Bureau. The systems are operating flawlessly, and Central is ready for an addition of 150 sites to the database architecture already developed. The data from all 275 meters will be used as described and will save valuable water supplies for efficient usage by Central’s members by avoiding over-replacement and allow staff to react to pumping data to better manage the augmentation plans. Members can access this pumping data into their on-farm water management plans, many of which are USDA EQIP irrigation projects.

The Northeast Colorado Augmentation SCADA Efficiency Project has the support of the Central Board members as signified by the attached resolution. Additionally, in the development of the budget for 2022, Central’s Board approved matching funding for the installation of FlowConnect™ equipment.

Currently, operators of the 1,300 wells in Central’s plans for augmentation provide monthly pumping data either by submitting a post card that is mailed to Central’s office or by inputting the data on Central’s member website. The balance of the member wells does not deplete the flow in the South Platte River as quickly as the 150 identified wells, therefore real-time data collection is not as important as the wells near the river. Over time, the District will utilize this technology on all the member wells to collect pumping data and incorporate other digital management tools such as rainfall, wind, and evapotranspiration monitoring for tailored real-time irrigation management.

Evaluation Criteria

Evaluation Criterion A—Project Benefits (35 points):

Benefits to the Category A Applicant’s Water Delivery System: Describe the expected benefits to the Category A applicant’s water delivery system. Address the following:

- Clearly explain the anticipated water management benefits to the Category A applicant’s water supply delivery system and water customers.

Water Savings

A representative single well dataset is shown in Figure A. This well located in Reach A has both characteristics of the management issue relative to predicting pumping groundwater for irrigation purposes. Six months of pumping demonstrated 26 acre-feet of over-replacement and there were three months in which the member pumped 23 acre-feet more than predicted. While on an annual average these numbers are essentially a net over replacement of three acre-feet, Central must account for and make replacements monthly. Therefore, water management objectives conflicted with Contract 956 every month the well operated in 2017.

Figure A: Contract 956 Pumping Data

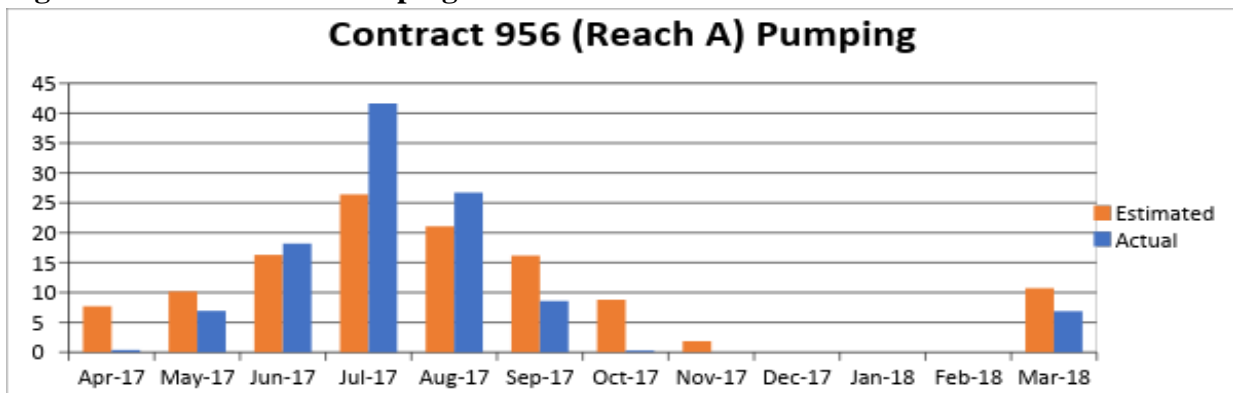


Figure B: Contract 449 (Reach E) Pumping Data

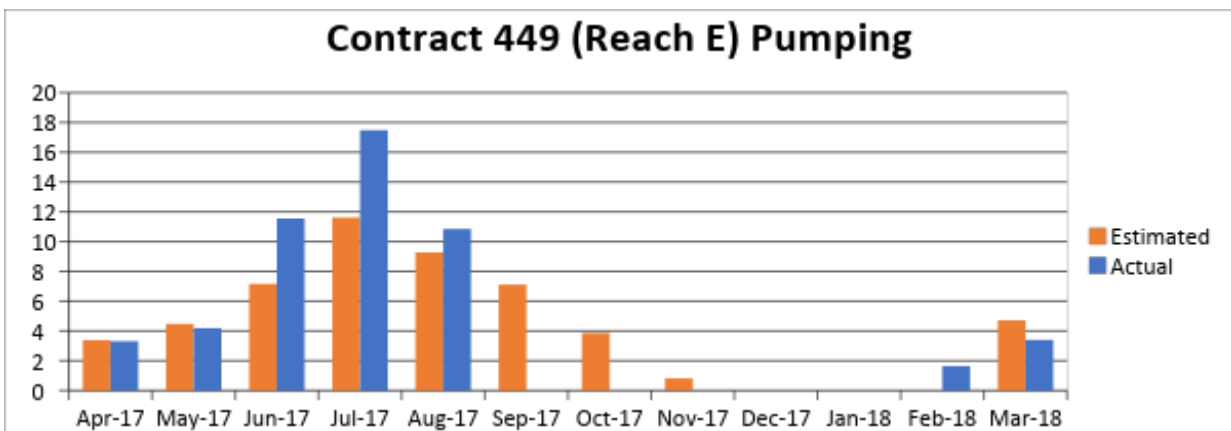


Figure B demonstrates a crop management and water management decision by the farm manager. Sometime during the month of August the land was no longer irrigated. This example is likely

due to a crop which was mature in August and later harvested. Contract 449 has several years of pumping history during the months of September and October which was not observed in 2017. Crop data is reported to Central after the irrigation season, this over-replacement example in Figure B could not be corrected without field verification of real time cropping observations or more frequent manual meter reading. Installation of telemetry on the well is the best solution. Another correlation between Figure A and Figure B; in July of 2017, 59 acre-feet was pumped in excess of the predicted pumping for both Contract 449 and Contract 956. July of 2017 was warmer than the past several years of data, something that is impossible to predict. However, with real-time FlowConnect™ data on this irrigation well, Central's staff can adjust to these types of situations and be prepared to replace the depletions appropriately.

Central's engineer evaluated the early pumping estimates for the 1,300 wells in Central's plans of augmentation and compared those results to the actual pumping. It was found that 6,996 acre-feet of over replacement was estimated in the early projections. In this application Central has demonstrated monthly estimates of pumping based on previous years data is difficult. Central estimates annual water savings by installing FlowConnect™ equipment on 275 wells in Central's augmentation plans to be up to 3,300 acre-feet per year. Additionally, having access to months such as July 2017 where members pumped nearly two-fold the average volume, Central can adjust and make replacements in real-time and avoid costly spot leases of replacement water if Central does not have any excess water on that given day or series of days. Denver-Metro municipal effluent leases on a spot basis average \$150 per acre-foot. The 59 acre-feet of excess pumping in July for Contract 956 and 449 would cost Central \$8,850 if there was no excess in Central's accounting. Likewise, Central on average can save several thousand dollars a year by reducing the amount of municipal water leases when members pump in excess of the projected pumping.

• *Explain the significance of the anticipated water management benefits for the Category A applicant's water delivery system and customers.*

o Are customers not currently getting their full water right at certain times of year?

In 2005 and 2006, Water Court approved augmentation plans for Central's Subdistricts initiated the need to track the consumption of alluvial groundwater. Starting in 2004, Central embarked on what would be required in these augmentation plans, individually metering groundwater wells. Over a span of 4 years, Central installed 1,300 McCrometer propeller flow meters on members wells as a requirement of the decrees. The United States Bureau of Reclamation WaterSMART 2025 Grant, awarded to Central, assisted in the financial costs necessary to purchase and install 1,300 meters. For nearly 15 years, the district has been collecting data manually from these McCrometer meters.

In 2004 Central's Board of Directors selected the McCrometer brand mechanical propeller meter to install on Central's member wells. In the proposed project, Central will upgrade the mechanical register of the McCrometer meter with a digital readout and telemetry package. The meter saddle, bearing assembly and propeller will remain in the well discharge pipe. Central has a maintenance program whereby each meter is maintained on a four-year rotating basis. Central's staff have been pleased with the robust lifecycle of the McCrometer meter, as 15 years of use has proven very successful. Upgrading these meters to telemetry with digital registers will also reduce the maintenance time required by Central staff due to eliminating some of the moving parts of the meter.

Reducing the amount of replacement supplies to the river will result in additional water supplies held in reserve – thus increasing supplies for the entire plan membership. Central is eager to embrace additional technology to further refine system efficiencies. Any waste associated with over-replacement has been water delivered to the South Platte River which is consumed by the next downstream calling water right. While the waste is utilized by other water right holders, it is a loss to the Central augmentation plans. Utilizing this well pumping data will reduce the losses to the river system and improve water supplies for Central members.

Equally important as to the consumption of groundwater, the decrees describe how depletions to the South Platte River are to be mitigated in time, place, and amount. Each of the 1,300 wells in Central’s augmentation plans have defined depletion patterns, which the decree accounting manages. In addition to accounting for depletions from pumping alluvial groundwater, the augmentation plan decree describes the process to provide replacement supplies to the river to offset groundwater pumping depletions. The augmentation plan decrees require using monthly pumping data and the replacement supplies accounted for on a daily basis as senior water right demands on the South Platte River can change daily, or even multiple times a day, depending on the available flow. With the adaptation of remote access to pumping data for wells which deplete the stream rapidly when operating, Central can fine-tune the replacement supply management in real-time fashion. To compliment the use of satellite telemetry for irrigation well pumping, Central has a very robust existing telemetry system to manage replacement supplies. Direct flow augmentation stations and discharges from water storage facilities can be remotely operated with telemetry to fine tune replacement supply. This replacement supply telemetry will be used to complement the telemetry data from the member wells.

o Does this project have the potential to prevent lawsuits or water calls?

Yes. This project will facilitate improved management of the largest augmentation plans in the state of Colorado. Being junior to the surface water rights in the South Platte River, Central operates the augmentation plans for the groundwater irrigators within the district. Once Central obtains real-time water use data on the wells that have the fastest impact on the South Platte River, the augmentation plan will facilitate more of a balance between surface water appropriators and groundwater users in the South Platte River basin. Real-time water use data on groundwater wells will provide the district with valuable information for the mitigation of these wells with surface water rights. This will improve the availability of water supplies for groundwater wells and surface water appropriators alike. Central is in constant collaboration between its groundwater user members and the Colorado Division of Water Resources, who manage both surface water and groundwater appropriators in the South Platte Basin.

o What are the consequences of not making the improvement?

If the junior groundwater wells are not covered in augmentation plan, they will not be able to pump water for irrigation. Irrigated crops will have to switch to dryland with serious economic effects to the local economy. Several jobs will be lost. The local livestock industry would be affected as well, since irrigated agriculture provides grain and forage to the livestock industry.

o Are customer water restrictions currently required?

Yes. As previously explained, acquisition and development of water rights, reservoirs, and retiming and reuse projects is extremely expensive in Colorado, particularly so in the South Platte Basin, due to competition for resources that is applied by Denver Metro communities and their pursuit for additional supplies for future growth. While Central has been diligent in the development and acquisition of additional water supplies, ongoing supply limitations and funding for new projects has been prohibitive to issuing a full allocation to GMS and WAS members. Since the decrees for the GMS and WAS Plans for augmentation were entered in 2005 and 2006, respectively, members of both subdistricts have routinely seen shortages from their GMS or WAS contract. Since 2005, shortages to GMS and WAS members have averaged 54% and 69% of the full contracted allocation, respectively.

o Other significant concerns that support the need for the project.

This project supports the continuation and further development of irrigated agriculture in the South Platte Basin. Front Range communities, which have seen rapid growth in recent years, have been aggressive in acquiring senior irrigation supplies in the South Platte Basin. Due to the nature of water law in the State of Colorado, these purchased water rights can only be used by those communities once the purchased senior irrigation supply is no longer utilized for irrigation on the historical farm. This process is referred to as “Buy and Dry” in the State of Colorado and the result of the process of “Buy and Dry” is a reduction in the number of irrigated acres, lower agricultural yields, and in some cases a complete cessation of agricultural production on the historical farm. Due to the current high levels of agricultural production in Central’s service area, lower agricultural production could lead to a scarcity in food resources for the State of Colorado and the nation.

One methodology for continuing the historical practice of irrigated agriculture in the South Platte Basin is to utilize groundwater alluvial wells to continue irrigation on lands in which the historical senior irrigation supply is no longer available. Central, through the WAS and GMS Augmentation Plans provides the water supplies and operation to continue this irrigation without negatively affecting other water rights holders. Increasing the efficiency of those augmentation plans allows Central to continue to allocate pumping to their members and the continuation of irrigated agriculture in the South Platte Basin, even without the historical surface water applied to dried up farms.

Broader Benefits: *Describe the broader benefits that are expected to occur as a result of the project. Consider: Will the project improve broader water supply reliability at sub-basin or basin scale?*

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

Yes. Central operates one of the largest augmentation plans in the South Platte Basin. Our vision and technical abilities have historically led to improved water management by area water managers who have adopted many of the management practices utilized by Central. We fully believe the adaptation to satellite telemetry data to better manage replacements supplies will be utilized by others. In addition, this project will facilitate data-sharing among Central’s groundwater users, Central staff, district engineers, and the Colorado Division of Water Resources.

• Will the proposed project positively impacts/benefit various sectors and economies within the applicable geographic area (e.g., impacts to agriculture, environment, recreation, and tourism)? Please explain.

Yes. Improvements to the efficiency of the augmentation plans operated by Central can improve the river conditions for all wildlife species. Threatened and Endangered species in the 750-square mile area of Central's boundaries include the Bald Eagle, Preble's meadow jumping mouse, Ute ladies' -tresses orchid, and Colorado butterfly plant. The access and installation of the project equipment will not impact any of the threatened or endangered species. The equipment will be installed on exiting McCrometer flow meters on individual irrigation wells.

Agriculture has struggled to survive on the plains of Colorado when competing with the urban areas on the Front Range of Colorado. Rural communities struggle economically as the farming community must compete with the larger cities for finite water supplies in Northeast Colorado. This technology will improve the water resource availability to these rural farming communities and support their economic viability by supporting their agricultural productivity.

• Will the project complement work being done in coordination with NRCS in the area (e.g., the area with a direct connection to the districts water supply)? Please explain.

Yes. Central has a long history of working with the USDA NRCS to promote and incentivize Irrigation Water Best Management Practices. Central has been a partner to EQIP programs in the past that have promoted the installation of center pivots, low pressure drops, and nozzles. Upon the successful implementation of this project, CCWCD intends to make an application to the Resource Conservation Partnership Program (RCPP) for additional complimentary Irrigation Water Management practices such as soil moisture monitoring and weather stations which will further promote water conservation in the South Platte Basin.

• Will the project help address drought conditions at the sub-basin or basin scale? Please explain.

Yes. Future water conservation will also be made possible through this project. Farmers will have access to daily water use figures which will aid in their individual on-farm management. Daily irrigation water application rates can then be compared to readily available local evapotranspiration rates from sources such as "Weather Underground" to enable farmers to closely match irrigation water applied to local crop water use. Once this initial phase of the project is complete, Central can then focus on member wells that have a lesser impact to the South Platte River and expand water savings to the river as well as on the farm.

Real-time groundwater use monitoring will also reduce conflicts between surface water appropriators and groundwater users. Real-time data will provide Central with the best information to augment groundwater pumping and as a result will decrease unnecessary surface water right purchases making those rights available to other users. The Colorado Water Courts are also over-taxed with conflicts between water users which will be lessened by the addition of this technology.

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

Plan Development: Describe how your project is supported by an existing planning effort. Identify the planning effort and who developed it. If the planning effort was not developed by the Category A applicant, describe the Category A applicant's involvement in developing the planning effort.

CCWCD's Sub-Districts, GMS and WAS, allocate annual pumping of groundwater to its members. The process of this pumping allocation is governed by the respective Sub-Districts augmentation plans. The GMS plan (Case No. 02CW335) was decreed in June of 2005, and the WAS plan (Case No. 03CW099) was decreed in May of 2008. Each of these Water Court decrees describe the need and purpose of gathering member well pumping data. CCWCD considers these decrees as water management plans for planning efforts related to this grant application.

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

- Is the project identified specifically in the planning effort?

CCWCD's Board of Directors are fully supportive of utilizing technology to obtain member pumping data. Operational efficiency, primarily reducing the amount of over-replacement due to lack of timely data, costs the Sub-Districts significant amounts of resources. Acquisition of augmentation supplies in the growing Front Range of Colorado is a challenge as competition for water has driven the cost of water dramatically. One of the simplest approaches taken by Central's Board is to improve operational efficiency. Several years ago, CCWCD developed, as an option to the postcard, a web-based meter reporting process for the Sub-District's members to report pumping data as the first step in water efficiency planning effort. Not all members have access or technical ability to use this web-based offering, and others felt the process to be cumbersome. Still, several have used the web-based option, however, not enough to meet the goals intended by the CCWCD Board. The proposed Telemetry Project will take that initial step to the next level as CCWCD staff will readily have the data at their fingertips.

- Explain whether the proposed project implement a goal or address a need or problem identified in the existing planning effort?

To further describe, we can examine the GMS decree provisions. April 15th of each year GMS is obligated to submit to the Water Court a projection model developed to justify the annual proposed volume of water to be pumped by GMS members. This projection model calculates prior pumping data from the members irrigation well meters and forecasts a pumping pattern for the projected pumping. Based on these past depletions and the forecasted pumping, the model accounts for available water supplies to prevent injury to vested water right holders. The result from the projection model is the annual member pumping allocation. Once the projection is submitted to the Water Court, GMS staff will account for member groundwater usage in real-time. Monthly, as required by the decree, GMS collects member well meter data. Currently, this monthly data arrives at the CCWCD offices by U.S. Mail in the form of a postcard with the beginning of the month meter pumping data handwritten, or via Central's website. Due to delays in mail delivery, tardiness of the member reporting and other factors, there can be up to two weeks of delay in obtaining the meter data. This delay causes operational inefficiency because GMS must then rely on the forecasted pumping volumes which results in over-replacement or under-replacement of

augmentation supplies. The implementation of Telemetry Units on the proposed irrigation wells will eliminate the issue of delayed reporting and will also conform to the requirements of both the GMS decree and the GMS Projection Model and therefore increase operational efficiencies.

Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures.

CCWCD has evaluated other options such as hiring additional staff for meter data collections but find that due to the travel distance to personally read, photograph and travel to each well, this process is not feasible in one or two days. The other complication with hiring additional staff is the decree requirement of having the meter read on the 1st of each month is that day can fall on a holiday or weekend causing conflicts. Management of the additional employees for the balance of the month is a challenge. CCWCD evaluated hiring a private contractor for meter readings on the 1st of the month. CCWCD found that option to be a problem due to the lack of individuals or companies who could perform that type of work within a reasonable budget and there was also a concern of data quality. A contractor would not only have to personally visit the irrigation well meter but would need to take a digital image of the meter register and enter the meter data into CCWCD's database. CCWCD felt that option was too risky due to the cost and lack of control of data being managed by the contractor.

Evaluation Criterion C—Implementation and Results (20 points):

• Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

- July 2022 - Successful notification of award from the Bureau
- Sept 2022 - Sign contract with the Bureau
- Oct 2022 - Relay meter calibration information to manufacturer for meter order.
- Nov 2022 - Mar, 2022: Upgrade **75** flowmeters with remote telemetry. Conduct field tests for meter accuracy.
- Oct 2023 - Relay meter calibration information to manufacturer for meter order.
- Nov 2023 - Mar, 2024: Upgrade **75** flowmeters with remote telemetry. Conduct field tests for meter accuracy.
- June 2024 - Prepare Final Project Report for Bureau

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

No permits are required for this project.

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

No engineering or design work is required for this project. CCWCD has already invested in the software engineering necessary to bring pumping data into district computer servers for reporting and modeling efforts.

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

No new policies or administrative actions are required for this project.

• Describe the timeline for completion of environmental and cultural resource compliance. Was the timeline for completion of environmental and cultural resource compliance discussed with the local Reclamation office?

CCWCD staff has informed Pat McCusker of the Eastern Colorado BOR office of the project. Based on the Environmental compliance costs from the 2019 BOR Grant approval and since installation of telemetry equipment will be installed on meters at existing pump sites, CCWCD estimates the total Environmental compliance costs will be less than \$1,500.

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

Is the proposed project connected to a Reclamation project or activity? If so, how? Please consider the following:

- *Does the applicant receive Reclamation project water? Is the project on Reclamation project lands or involving Reclamation facilities?*

No, Central does not receive Reclamation project water and the Northeastern Colorado Augmentation SCADA Efficiency Project is not on Reclamation project lands or involve Reclamation Facilities.

Is the project in the same basin as a Reclamation project or activity?

Yes. The Colorado Big Thompson (CBT) Project is in the South Platte Basin in Northern Colorado. The CBT project diverts water from the Western Slope of Colorado to the Eastern slope, constructed in the 1940's. The CBT Project is a Reclamation project. Future growth in Colorado's Front Range is expected to double in 50 years or less. Increased efficiency of groundwater as a supplemental or primary irrigation supply could help lengthen the timeline for full conversion of CBT project water to municipal and industrial from agricultural use.

- *Will the proposed work contribute water to a basin where a Reclamation project is located?*

Yes. CCWCD was fortunate to receive FY'18 funding from the Bureau for the Walker Project near Wiggins, CO. This is a groundwater recharge project that will help to retime flows in the South Platte River downstream of the proposed project.

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

Without repeating benefits already described in previous criteria, describe in detail how the proposed project supports a priority(ies) below.

E.1.5.1. Sub-criterion No. E1. Climate Change

Points will be awarded based on the extent the project will reduce climate pollution; increase resilience to the impacts of climate change; protect public health; and conserve our lands, waters, oceans, and biodiversity. Address the following as relevant to your project.

Combating the Climate Crisis

E.O. 14008: Tackling the Climate Crisis at Home and Abroad, focuses on increasing resilience to climate change and supporting climate- resilient development. For additional information on the impacts of climate change throughout the western United States,. Please describe how the project will address climate change, including: • Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.

CCWCD employs 5 staff members that regularly read and perform maintenance on currently installed irrigation flow meters in the district. The district conservatively estimates that district staff drive 6,000 miles per year solely for reading meters. The district estimates that upon the conclusion of this project, the miles driven will be reduced by at least 50% to 3,000 miles per year.

Miles driven by water users within the district will also be reduced since landowners have to regularly observe and report meter readings to Central's office. Often times, this reporting is accomplished by driving to the meter, manually recording the meter reading, driving back home or to their office, and then mailing the recorded reading to the district. Automatic, remote readings from the water meters via telemetry eliminates the need to manually report these readings. In addition, automatic, remote readings from the water meters via telemetry will be far more frequent, efficient, time sensitive, and more accurate than manual readings by district employees and landowners/irrigators.

The mode of communication selected by CCWCD used by the FlowConnect system is satellite which is arguably more energy efficient than a cellular system because of the constant regular maintenance of cellular towers as compared to satellites. Satellite communication is also less prone to outages and service interruptions in remote and rural communities in which some Central wells are located. Service interruptions and outages would lead to a disruption in communication by any meters with cellular communication installed, thus reducing the efficiency of the overall project. Often interruptions by cellular communication devices results in Central employees visiting the site to verify and correct any communication issues. Since these meters can be geographically distant from one and another, this leads to additional fuel expended by Central employees and can lead to additional vehicle maintenance by the District.

• Does this proposed project strengthen water supply sustainability to increase resilience to climate change? Does the proposed project contribute to climate change resiliency in other ways not described above?

Yes. The implementation of this project will improve the management of groundwater in relation to surface water within CCWCD as well as much of the reach of the South Platte River within the State of Colorado. When ground and surface water resources are managed conjunctively, depletions to the river will be diminished which have the opportunity to interfere with the use of surface water rights or limitations on the use of groundwater wells supporting the sustainability of water resources in the South Platte Basin as well as resiliency to shortages that may be caused by climate change.

E.1.5.2. Sub-criterion No. E2. Disadvantaged or Underserved Communities

Will the proposed project serve or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to, public health and safety by addressing water quality, new water supplies, or economic growth opportunities.

Yes. 2019 data from the U.S. Census Bureau reports that the annual median household income for the State of Colorado is **\$72,331**. The median annual income for two of the three counties in the CCWCD is less than the statewide annual median household level as shown in the table below:

CCWCD Counties	2019 Median Household Income
Adams	\$71,202.00
Morgan	\$53,682.00
Weld	\$74,150.00

Section 1015 of the Cooperative Watershed Act defines a disadvantaged community as one with an annual median household income that is less than 100 percent of the statewide annual median household income for the State. Consequently, the majority of the project area meets the criteria for a disadvantaged community in two of the three counties. (<https://data.census.gov>)

- *Please describe in detail how the community is disadvantaged based on a combination of variables.*
- *If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.*

Agricultural operators in CCWCD and the South Platte River Basin have experienced narrow profit margins for several years for many of the commodities that they produce. Despite recent increases in agriculture commodity prices such as corn, soybeans, and beef, profit margins remain to be narrow because of increasing input prices for fuel, fertilizer, herbicides/pesticides, and seeds. A more efficient augmentation plan will replace depletions as they occur and expand the water supply, leaving more water to be used by these farms to generate income.

E.1.5.3. Sub-criterion No. E.3. Tribal Benefits

Points will be awarded based on the extent to which the Project will honor the Federal government’s commitments to Tribal Nations.

- *Does the proposed project directly serve and/or benefit a Tribe? Will the project improve water management for a Tribe? Does the proposed project support Tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety by addressing water quality, new water supplies, or economic growth opportunities?*

No tribes are located within the CCWCD Plan area.

Project Budget

Funding Plan and Letters of Commitment

Central’s subdistricts have budgeted funds collected from member assessments and local property taxes to pay for the matching portion of the telemetry equipment. No expenses are to be incurred prior to the project start date. No funding requests are pending with any other entities.

Central staff will be responsible for the installation of the telemetry units. Central is requesting **\$100,000** from the Bureau or **44.7%** of the cost of the project. The cash match provided by Central would be **\$123,525** or **55.3%**. No outside funding sources are included in this proposal and consequently no letters of commitment are attached.

Funding Sources	% of Total Study Cost	Total Cost by Source
Costs to be reimbursed with the requested federal funding	44.7%	\$100,000
Costs to be paid by applicant, CCWCD	55.3%	\$123,525
Totals	100%	\$223,525

Budget Item Description	Computation \$/unit	Quantity	Quantity Type (hours/days)	Total Cost
Salaries and Wages				
	No federal funds to be used for salaries/wages			
Fringe Benefits				
	No fringe benefits provided by this project			
Travel				
	No federal funds to be used for travel to install equipment			
Equipment				
Flow Meter Telemetry Stations	\$1,455.20	150		\$218,280
Weather Stations	\$1,311.25	4		\$5,245
Subtotal				\$223,525
Supplies and Materials				
				\$0
Subtotal				\$0
Contractual/Construction*				
				\$0
Subtotal				\$0
Total Project Costs				\$223,525

Budget Narrative

Central staff will perform the task of the telemetry installation. The expense for installation will be borne by Central but will not be submitted as an in-kind expense. Central estimates that two staff members can install up to four units in a day, requiring a minimum of 30 days to perform the task. Hourly pay-rate for field staff is \$25.25 per hour, resulting in a cost to Central of \$5,681.25. Additionally, there will be an estimated 2,820 miles of driving to the member well sites for the installation and meter verification. Using the current Federal mileage allowance of \$0.545 per mile, the cost to Central will be \$1,536.90 for its vehicles. This represents an additional contribution of \$7,218.15 by Central not reflected in the above budget.

Materials and supplies required for the SCADA project consist of one flow meter telemetry station per irrigation well, and the stations will be installed on 150 wells. The cost per unit of \$1,455.20 was determined by a quote (Exhibit B) of materials from McCrometer, Inc. The telemetry will be utilized by office staff and field staff when determining replacement water needed for the augmentation plan well pumping depletions. McCrometer has extended discount pricing to Central for this project that would not be available on a retail basis providing an additional benefit to the project that is not reflected in the budget.

The State of Colorado requires that irrigation flow meters need to be tested for accuracy if they are altered in any way. Due to this requirement, after the telemetry stations are installed, the irrigation wells will need to be recertified for accuracy by certified well testers. These independent contractors will test all 150 wells for certification. \$300 is the current standard charge to have a flow meter certified. This represents an additional contribution of \$45,000 by Central not reflected in the above budget

Environmental and Cultural Resource Considerations

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

No, The project will not impact the surrounding environment, no earth-disturbing activity will occur at each of the 150 project sites. At each irrigation well, Central staff will replace the mechanical McCrometer meter register and replace with the electronic FlowConnect™ meter. Nothing more than the appearance and size of the register head will be noticeable. Central has selected the internal battery option to power the units, so no excavation for installation of any cabling to power the unit is required.

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

Threatened and Endangered species in the 750-square mile area of Central's boundaries include the Bald Eagle, Preble's meadow jumping mouse, Ute ladies' -tresses orchid, and Colorado butterfly plant. The access to wells and installation of the project equipment will not impact any of the threatened or endangered species or their habitat.

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

No.

- *When was the water delivery system constructed?*

The water delivery structures being measured in this grant application are the 150 irrigation wells. Irrigation well drilling started in the late 1930’s and proliferated in the 1950’s following the advancement of reverse-rotary mud drilling and rural electrification. All of the 150 wells were originally installed between 1935 and 1970, with the majority of those being drilled in the mid-1950’s.

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

The project sites are on existing wells, the areas immediately surrounding the wells are in active farmland with access roads leading to the well. Nearly 7,000 alluvial irrigation wells were drilled in the South Platte Basin extending from Denver downstream to Julesburg, CO at the Nebraska state line from 1930 to 1970. While many of these wells operate in the original location, most wells have been re-drilled as the well casing has a life of 50 to 60 years at most.

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

None of these sites have cultural or historical significance, nor to Central’s understanding have any of the 1,300 wells in the augmentation plans been registered with the State Historical Preservation Office.

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

No known archeological sites exist in the project areas proposed.

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

No, to the contrary, this project has the potential to have a positive effect on low income or minority populations since the agricultural economy will be supported by this project.

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

No sacred Indian sites exist in the project locations or tribal lands.

- *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?*

No, the project will not involve any excavation or movement of soils, so no effect on any noxious weed species in the project areas.

OFFICIAL RESOLUTION

The Central Board of Directors adopted a resolution at their meeting held on **March 15, 2022**. A copy of the Resolution is attached hereto as **Exhibit A**.

UEI AND SAM

Central is registered with SAM, and the UEI is FB1JVUFHX317.

**RESOLUTION
OF THE BOARD OF DIRECTORS OF THE
CENTRAL COLORADO WATER CONSERVANCY DISTRICT,
THE GROUNDWATER MANAGEMENT SUBDISTRICT OF THE
CENTRAL COLORADO WATER CONSERVANCY DISTRICT
AND THE WELL AUGMENTATION SUBDISTRICT
OF THE CENTRAL COLORADO WATER CONSERVANCY DISTRICT
REGARDING AUTHORIZATION OF THE SUBMITTAL OF A U.S. BUREAU OF
RECLAMATION WATERSMART SMALL-SCALE WATER EFFICIENCY
PROJECT GRANT APPLICATION**

WHEREAS, Central Colorado Water Conservancy District, is a Water Conservancy District formed and operating pursuant to the Colorado Water Conservancy Act C.R.S. §§37-45-101 et seq.; and

WHEREAS, the Ground Water Management Subdistrict of the Central Colorado Water Conservancy and the Well Augmentation Subdistrict of the Central Colorado Water Conservancy District are water conservancy districts and subdistricts of the Central Colorado Water Conservancy District (collectively all three Districts are hereinafter referred to as "Central"); and

WHEREAS, Central operates two large decreed well augmentation plans and manages diverse water rights including direct flow surface rights; ground water rights; water storage rights; and alluvial aquifer recharge projects; and

WHEREAS, Central is a recognized leader in its ability to manage a complex portfolio of water rights in an efficient manner that maximizes beneficial use of scarce water resources; and

WHEREAS, Central has installed FlowConnect SCADA equipment on 120 irrigation wells within Central's boundaries to provide real-time data to supplement Central's operations of its decreed augmentation plans in an efficient manner using funding provided by a 2019 WaterSMART grant; and

WHEREAS, Central seeks to install FlowConnect SCADA equipment on an additional 150 irrigation wells within Central's boundaries to provide real-time data to supplement Central's operations of its decreed augmentation plans in an efficient manner; and

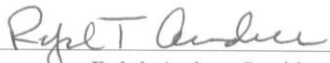
WHEREAS, Central's staff has prepared an application to the Bureau of Reclamation (hereinafter "Reclamation") to participate in a cost sharing program with Reclamation under Reclamation's WaterSMART Grant program, a copy of said "Grant Application" is attached hereto as Exhibit A; and

WHEREAS, Central's Board of Directors has reviewed the Grant Application and desires to proceed with submitting the same.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of Central that:

1. Central's Board of Directors has reviewed the Grant Application and authorizes Mr. Randy Ray, as Executive Director of Central to submit the same.
2. Any agreements required to be entered as a result of the approval of the Grant Application by Reclamation shall be approved by the Board of Directors of Central and signed by its President and attested by its Secretary. The President of the Central Board is presently Mr. Ralph Anders and Mr. Randy Ray is currently the Secretary of the Board.
3. Central has sufficient funds budgeted and the ability to provide in-kind contributions in order to meet its cost share requirement per the requirements of the funding plan associated with the Grant.
4. If a Grant Application is approved, Central will work in good faith with Reclamation to meet any established deadlines for entering into a grant or cooperative agreement with Reclamation.

APPROVED this 15th day of MARCH, 2022.


Ralph Anders, President

Central Colorado Water Conservancy District

Groundwater Management Subdistrict of
the Central Colorado Water Conservancy District

Well Augmentation Subdistrict of
the Central Colorado Water Conservancy District

ATTEST:


Secretary

CERTIFICATE

I, Randy Ray, do hereby certify that the above is a true and correct copy of a Resolution adopted by the Board of Directors of the Central Colorado Water Conservancy District on the 15th day of March 2022.

Letter of Participation



3255 West Stetson Avenue
Hemet, CA 92545 USA
Tel (951) 652-6811
Fax (951) 652-3078
www.mccrometer.com

April 18, 2022

Central Colorado Water Conservancy District
Attn: Randy Ray, Executive Director
3209 W 28th Street
Greeley, CO 80634

Re: Bureau of Reclamation Water Smart Application; "**Northeast Colorado Augmentation SCADA Efficiency Project**"

Dear Mr. Ray:

McCrometer is glad to be a partner in the project titled "**Northeast Colorado Augmentation SCADA Efficiency Project**". McCrometer will commit to supplying meters and telemetry equipment as well as technical support upon the successful award of this grant proposal.

McCrometer has provided durable and accurate flow measurement devices for the agricultural irrigation industry for over 60 years. This project will support agriculture, improved water management for groundwater preservation, and local communities in the South Platte Basin of Colorado.

McCrometer applauds the Bureau of Reclamation for the recognition of practices that will enhance irrigation water management in the industry of agriculture by supporting projects through the Water Smart Program and strongly encourages the approval of this proposal.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Kenneth A. Quandt".

Kenneth A Quandt
Regulatory Development Manager, Agriculture
McCrometer, Inc.