WaterSMART Drought Response Program: Drought Resiliency Projects for Fiscal Year 2022

Funding Opportunity Number: R22AS00020

Aquifer Storage and Recovery Well at Engle/Garfield Carmichael, CA October 2021





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Acronyms and Abbreviations

AF	acre-feet
AF/Y	acre-foot per year
ASR	Aquifer Storage and Recovery
CEQA	California Environmental Quality Act
CWD	Carmichael Water District
DDW	Division of Drinking Water-California State Water Resources Control Board
DWR	California Department of Water Resources
DWSA	Drinking Water Source Assessment
GPM	gallons per minute
MGD	million gallons per day
NAHC	Native American Heritage Commission
NDMA	Nitrosodimethylamine
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NTUs	Nephelometric Turbidity Units
PCA	Principal Component Analysis
Reclamation	United States Bureau of Reclamation
RDCP	North American Basin Regional Drought Contingency Plan
RWA	Regional Water Authority (Northern California)
RWQCB	Regional Water Quality Control Board, Central Valley Region
SCADA	Supervisory Control and Data Acquisition
SCEMD	Sacramento County Environmental Management Division
SGA	Sacramento Groundwater Authority
SGMA	Sustainable Groundwater Management Act
SMUD	Sacramento Municipal Utility District
Subbasin	North American Subbasin
SWPPP	Storm Water Pollution Prevention Plan
WSCP	Water Shortage Contingency Plan

Technical Proposal and Evaluation Criteria

Executive Summary

Date:	October 1, 2021
Applicant:	Carmichael Water District
City:	Carmichael
County:	Sacramento
State:	California

Carmichael Water District is a Special District and Category A applicant.

The Carmichael Water District, located in Sacramento County in Northern California, will improve its drought resiliency and water reliability by constructing a new aquifer storage and recharge (ASR) well with 1,500 GPM groundwater production capacity and with 750 GPM recharge capacity. The project will include related improvements including a fenced perimeter, paved access, backup generator, water treatment equipment, and a small structure to cover the motor control panel. A new well with ASR capabilities will greatly enhance the District's conjunctive use objectives, allowing the District to bank water during normal and wet years and utilize the banked water during drought periods—reducing the demand on the stressed American River of up to 1,210 AF/Y when operated during the peak demand season of May through October. The most recent U.S. Drought Monitor Map released on September 21, 2021 shows the Sacramento drought intensity at level D4, Exceptional Drought. With climate change leading to the recent severe drought conditions, CWD's water rights to its American River surface water supply were curtailed for the first time in its 100-year history in 2014/2015 and again in 2021. During curtailment the District is constrained to utilizing its groundwater production wells supplemented with emergency actions such as purchasing water and securing other temporary out of District water supplies. With the need to secure future water supply reliability, the District is compelled to leverage its underutilized sustainable groundwater supply. The District's 2020 Urban Water Management Plan¹ identified the need for increased groundwater production and development of additional wells to help build long-term resilience to drought and reduce the need for emergency response actions. The project will promote conjunctive use of both the American River surface water and the groundwater of the North American Subbasin (Subbasin) within the Sacramento Valley Groundwater Basin.

The project will continue for 24 months commencing by November 2021 with target completion date of October 2023.

This project is not located on a Federal facility.

¹ Tully, G.-M., Young, G., Olof, K., Davis, G., Bolland, D., Xu, J., McCarl, J., Nelson, C., Lee, C., & Medill, M. (2021). (rep.). *2020 Urban Water Management Plan*. Carmichael Water District. Retrieved from https://carmichaelwd.org/wp-content/uploads/2021/07/CWD-Final-06.30.21.pdf

Project Location

CWD is located in the North American Subbasin (Subbasin) within the Sacramento Valley Groundwater Basin in Figure 1 below. The Subbasin extends to portions of Sacramento, Placer and Sutter counties and is an important resource for water purveyors in Sacramento County serving approximately half of a million people in the region. As groundwater management is critical to regional water reliability, proactive management decisions to ensure the basin's health lead to the development of Water Accounting Framework in 1998 and the Water Forum Agreement in 2000. Forward thinking management strategies have advanced conjunctive use in the region resulting in stabilized and consistent groundwater levels while providing environmental benefits of preserving surface waters in the lower American River. The Subbasin is classified as a medium priority basin under California's Sustainable Groundwater Management Act (SGMA) and managed by the Sacramento Groundwater Authority (SGA) within Sacramento County.



Figure 1 – North Area Subbasin Map

The proposed ASR well is located within CWD at 3700 Garfield Ave, Carmichael, CA 95608. The Assessor's Parcel Number is 258-0040-015. The project latitude is 38°37'55"N and longitude is 121°20'14"W. The new groundwater well site is near the intersection of Engle Road and Garfield Avenue as shown in the map below designated as "New Well Site", in Figure 3 below.



Figure 3 – Project Location Map

Technical Project Description

CWD currently operates four groundwater wells in addition to its American River supply for peak demand. The wells typically include below ground (well components) and above ground (top side) improvements and the new ASR well will also have the same improvements.

The project will begin with construction of the well. The mobilization of equipment and materials to the well site would occur over approximately a week period and equipment and materials would be stored on-site for the duration of construction. A site yard/staging area would be established, and a project trailer may be moved onto the construction site. Temporary fence will be installed for public safety and site security.

Well construction would take place over a period of 8 weeks and would require approximately 14 days of continuous (24-hour/day) drilling operations sometime during the 8 week period. The well would be drilled to a depth of about 700 feet based on existing wells geological information and intermittent twenty four-hour drilling operations are necessary to avoid caving of the borehole and possible loss of the well prior to completion. During the drilling of the pilot borehole, CWD's consulting geologists will be on-site to evaluate soil cuttings for permeability, observe and interpret geophysical logging for water bearing layers, perform isolation zone testing for water quality samples, and coordinate contractor's activities. Upon completion of the pilot

hole drilling, geophysical logging, and sediment sampling, CWD will work with consultant to develop a final well design for maximum well yield and acceptable water quality.

Prior to starting to ream the pilot hole the contractor will order the well construction materials and will coordinate delivery of the materials with completion of the pilot hole drilling. CWD and its consultants will confirm that the materials used to construct the well and installation of the casing and screens, gravel packing of the annular space and placement of concrete sanitary and annular seals comply with the specifications.

Once the well components are installed, the well will be developed and test pumped to remove drilling fluid and remaining sediments from the well screen and the annual space and evaluate the pumping (production) rate for top side improvements design.

After the well has been drilled, the construction of "top side" improvements would take place over a 12 to 18 month period. This includes constructing site improvements with related driveways and landscaping, mechanical piping and appurtenances, chlorination facility, electrical equipment, and instrumentation controls. The project will also include a back-up generator to ensure the well is operational during electrical outage events. With the increased wild fire events in California and the implementation of Public Safety Power Shutoff (PSPS) prevention system, a back-up generator allows CWD to operate the well to continue provide water for public safety.

Construction demobilization will take place over a two-week period following the completion of top side improvements. Construction equipment will be transported off site. The site yard/staging area would be broken down and support apparatus transported off-site and construction fences removed. The area would be generally cleaned up to ensure trash or unused materials are not left on or near the site.

Please find the detailed project milestones and related technical tasks described in Project Implementation Criterion in Section E.1.5.

Performance Measures

Performance of the project will be determined by both the well groundwater production and aquifer storage recharge volumes measured through a calibrated flow meter located at the discharge of the well pump. The flow meter will have both instantaneous flow and total volume/quantity flow output to track the current flow volume and peak values, as well as the total volume of water that is produced by the well and supplied to the system as well as the total volume of water used to recharge the aquifer over any given period of time. The data from the flow meter will be transmitted through the SCADA network connection to the Districts central SCADA computer where the data will be logged and available in real-time and at any future time. Water production will be reported to the regulatory agencies and other interested parties, including the California Department of Water Resources, using established reporting systems. The information will be used in annual evaluation of the effectiveness of conjunctive use practices and water supply management.

Evaluation Criteria

Criterion A: Project Benefits

Groundwater has long been a reliable water resource in California. According to the California Department of Water Resources (DWR), groundwater provides about 38% of the entire state water supply during average rainfall years and up to 46% or more during dry years. It serves as buffer against the impacts of drought and climate change. With the extreme weather patterns California experiences, floods or droughts, storage is the only solution to hold excess water for later use. Suitable groundwater basins can provide ample storage space without the environmental or financial concerns of surface storage. Conjunctive use of stored surface water and groundwater ensures a reliable availability and operational flexibility.

The ASR well at Engle/Garfield project will help build long-term resilience to drought by producing approximately 2.16 MGD. The well is planned to be a primary supply during periods of curtailment and drought when there is a lack of surface supplies. The well will also be operated for aquifer storage recharge during periods of an abundance of surface supplies. During a 6-month curtailment period the well production would amount to 1,210 AF. The well is expected to provide benefits for 75 years before major rehabilitation is required. The daily peak system demand is approximately 14.5 MGD, and the current 4 active wells provide 8.31 MGD. The ASR Well at Engle/Garfield production of 2.16 MGD represents an additional groundwater supply of 26%. In 2020 the UWMP assumed a groundwater supply of 6,646 AF/Y and for 2021-2025 it assumes a total groundwater supply of 8,066 AF/Y which represents a projected total annual water supply increase of 1,420 AF/Y from the ASR Well at Engle/Garfield (UWMP, 2020, p.3-19).

The ASR Well at Engle/Garfield would have a maximum capacity of producing a maximum of 2,420 AF/Y if operated continuously for a year. For sustainable groundwater management the Aquifer Storage and Recovery system could be operated during heavy winter flows in the American River to recharge the aquifer up to 3.3 acre-feet per day. The average benefit over 10 years would be a new available groundwater supply of 2,420 AF/Y of which 1,210 AF/Y could be utilized during drought period to provide drought resiliency; and the average benefit for ASR recharge is 605 AC/Y. The water supply benefits are summarized in Table 2 below.

	Year of Added Benefit from ASR Well at Engle/Garfield											
Added Groundwater Capacity	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	10- Year Total	
Production AF/Y	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	24,200	
Recharge AF/Y	605	605	605	605	605	605	605	605	605	605	6,050	

Table 2: ASR	Well at Engle	/Garfield	Groundwater	Supply	Benefits
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This added production and recharge capacity will improve the management of water supplies by increasing operational flexibility during normal years and improve the ability to delivery water during periods of drought and curtailment. The ASR functionality of the well is a sustainable solution which enables the District with maximum flexibility to not only increase usage of its groundwater supply, but represents a sustainable management tool to recharge the groundwater supply such that the groundwater supply is available for future generations.

Background on the North American Subbasin

The Sustainable Groundwater Management Act (SGMA) was signed into law in September 2014. SGMA requires development of Groundwater Sustainability Agencies (GSA) and Groundwater Sustainability Plans (GSP) to achieve sustainability in the state's groundwater basins. In 2016, SGA became the GSA for the North Basin and SGA and the other GSAs in the North American Subbasin must prepare a GSP in compliance with SGMA by January 2022. Currently, the primary planning document for the groundwater basin is SGA's 2014 GMP. As such, the guiding principles in that document govern the District's groundwater planning in the North Basin.

The SGA GMP assessed the groundwater levels in the North Basin. For about 40-50 years up through the mid-1990s, groundwater production in the North Basin resulted in a general lowering of the groundwater levels near its center. As groundwater management is critical to regional water reliability, proactive management decisions to ensure the basin's health lead to the development of Water Accounting Framework in 1998 and the Water Forum Agreement in 2000. Forward thinking management strategies have advanced conjunctive use, managed use of both surface water and groundwater, in the region resulting in stabilized and consistent groundwater levels while providing environmental benefits of preserving surface waters in our rivers. Recent regional conjunctive use activities, like those undertaken by the District, have resulted in providing new surface water supplies to water purveyors historically producing groundwater in the central portion of the North Basin. Although water purveyors in the region will rely more heavily on groundwater during dry periods, the net increase in available surface water have resulted in a maintained or improved amount of groundwater in storage in the basin over the long term. The average safe yield of the groundwater basin is estimated by SGA to be 131,000 af/yr.

The District has the right to pump naturally occurring percolating groundwater from the waterbearing formations in the North Basin. That right is only limited by the general terms identified in the SGA GMP. Specifically, the District is utilizing a groundwater appropriation right to extract groundwater and deliver it to water users within its service area. Generally, in times of shortage, the majority of groundwater users in the North Basin are municipal users and the groundwater basin is generally stabilized, considerations about the priority of groundwater pumping are not impactful to the 2020 UWMP.

The SGA also developed rules and regulations for banking groundwater within the North Basin. These rules and regulations are collectively called the Groundwater Accounting Framework (Framework). The Framework recognizes investments by the SGA member agencies in the development of conjunctive use programs and supports groundwater banking programs that enhance the long-term sustainability of the groundwater basin.

According to the parameters of the Framework, the District has been pumping less naturally occurring percolating groundwater each year since 1998. The District has a targeted groundwater pumping allocation of 12,000 af/yr in accordance with the Water Forum Agreement. The District has pumped a portion of this annual allocation but has reduced its overall pumping by nearly 5,000 acre-feet per year. This reduction in groundwater use was largely made possible through the completion of the Bajamont WTP in 2001. As a result of the District's implementation of proactive conjunctive use, the District has banked over 50,000 acre-feet of groundwater in the basin since 1998. This water may now be available as a District resource and buffer for dry year access, or for selling credits to other interested parties in the basin that could benefit from the stored supply.

Banked groundwater has a special meaning in the context of California law. Water that could have otherwise been taken but was not taken and instead preserved for future use is treated as a beneficial use of water. As such, the banked water gains a more senior water right priority even above those of overlying groundwater users. The reason for this designation is that the forbearance actions of the potential user makes the water available in the basin. Therefore, the water – or at least a portion of it – is banked and protected for that user for future use. The SGA Framework further solidifies this principle by applying an agreement among participating agencies about the disposition of banked water in the basin.

Criterion B: Sustainability and Supplemental Benefits

1. 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. Examples in which proposed projects may contribute to climate change adaptation and resiliency, may include but are not limited to the following:

The project incorporates the use of a variable frequency drive which maximizes the efficiency of the well pump motor and minimizes electrical usage to conserve electrical energy.

- 2. Ecological Value:
 - Does the project seek to improve ecological climate change resiliency of a wetland, river, or stream to benefit to wildlife, fisheries, or habitats? Do these benefits support an endangered or threatened species?

The project will adhere to regional conjunctive use policies which will directly improve ecological climate change resiliency of the American River and ultimately the Sacramento – San Joaquin River Delta to benefit wildlife, fisheries, and habitats by utilization of conjunctive use strategies to partner with the American River water purveyors to mitigate impacts to the American River and downstream tributaries. Per the North American Basin Regional Drought Contingency Plan included as Appendix B,

"The recently completed Sacramento and San Joaquin Rivers Basin Study (SSJRBS)² (March 2016) identifies projected impacts of future climate change conditions on water supply, fish and wildlife protection, and flood management due to reductions in snowpack, changes in seasonal runoff, and rising sea levels. In the American River Basin, the potential effects of a changing climate have introduced significant uncertainty in long-term water supply reliability. Folsom Reservoir has a limited capacity relative to the watershed it serves. Fortunately, seasonal snowpack provides a large portion of the storage necessary to regulate runoff for water supply. Warming conditions and changes in precipitation patterns in the Sierra Nevada Mountains threaten the volume of water stored in the snowpack and the timing of runoff entering the reservoir. Further, because of the superior water quality in the American River and its close proximity to the Sacramento-San Joaquin Delta (Delta), Folsom Reservoir is relied on by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) as the "first responder" in CVP operations to satisfy Delta flow and quality standards and other requirements for protecting endangered fishery species."³

As outlined in USBR's "Plan of Study for the American River Basin Study" dated January 13, 2017, "(*i*)*mbalances in the American River Basin relate to both water quantity (for consumptive uses) and water quality (for the management of temperature and flows for protection of endangered fishery species*)."⁴ The ASR well project will improve American River fisheries by allowing CWD to use banked groundwater from the Subbasin aquifer during the river's low flows conditions and *preserve cold water for fisheries in the American River.*

• What are the types and quantities of environmental benefits provided, such as the types of species and the numbers benefited, acreage of habitat improved, restored, or protected, or the amount of additional stream flow added? How were these benefits calculated?

Although this project does not directly have a quantifiable objective of the environmental benefits, preservation of surface water in the American River has correlated and cumulative environmental benefits. The benefits were not quantified and/or calculated as this is beyond the scope of this project. The well will normally run during the peak demand months of May through October conserving a total of approximately 1,210 AF/Y of surface water in the American River.

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

ARBSPlanofStudy20170113-1.pdf

² U.S. Department of Interior, Bureau of Reclamation, Sacramento and San Joaquin River Basin Study, Basin Study Technical Report, March 2016. Retrieved from

https://www.usbr.gov/watersmart/bsp/docs/finalreport/sacramento-

sj/Sacramento_SanJoaquin_TechnicalReport.pdf.

³ Regional Water Authority, North American Basin Regional Drought Contingency Plan, October 2017. Retrieved from https://rwah2o.org/wp-content/uploads/2017/11/NorthAmericanBasinRDCP_Oct_2017.pdf.

⁴ U.S. Department of Interior, Bureau of Reclamation, Plan of Study for the American River Basin Study, January 13, 2017. Retrieved from https://cdn.cosmicjs.com/a0e68070-3273-11ea-bfe8-5b62c3bdf959-

Although this project does not have a quantifiable environmental surface water conservation target, minimizing surface water extraction from the American River during low flow periods has a beneficial impact to the wildlife in the river habitat.

3. Other Benefits: Will the project address water sustainability in other ways not described above?

CWD is a member of the RWA, a joint powers authority formed in 2001 and consisting of more than 20 water suppliers in the greater Sacramento region for the purpose of protecting and enhancing the sustainability of regional water supplies. The project incorporates ASR technologies to allow for conjunctive use regional coordinate and strategies to benefit the American River sustainability for the benefit of multiple sectors and users in the region who benefit from the American River including agriculture, municipal and industrial, environmental habitat, recreation, and also potentially statewide water users who can participate in water transfers when regional conjunctive use strategies permit.

Criterion C: Drought Planning and Preparedness

• Explain how the applicable plan addresses drought. Proposals that reference plans clearly intended to prepare for and address drought will receive more points under this criterion.

Please see a detailed description of the two most recent drought plans intended to prepare for and address drought in the Existing Drought Contingency Plans section. Both the CWD 2020 Urban Water Management Plan and Water Shortage Contingency Plan, and the North American Regional Drought Contingency Plan are referenced. Both plans in their entirety can be found in Appendix B.

• Explain whether the drought plan was developed with input from multiple stakeholders. Was the drought plan developed through a collaborative process?

The RDCP participating agencies included California Department of Water Resources, California American Water, Carmichael Water District, Citrus Heights Water District, City of Folsom, City of Lincoln, City of Roseville, City of Sacramento, Del Paso Manor Water District, Fair Oaks Water District, Golden State Water Company, Orange Vale Water Company, Placer County Water Agency, Regional Water Authority, Rio Linda/Elverta Community Water District, Sacramento County Water Agency, Sacramento Suburban Water District, Sacramento Water Forum, and the San Juan Water District.

Yes the drought plan was developed through a collaborative process. The RDCP Communications and Outreach (C&O) Plan was developed to help ensure active stakeholder and public engagement in preparation of the RDCP, providing organizational structure, and serving as a general outline for the communication and outreach activities associated with the RDCP. It described how stakeholders and members of the public could be involved in the planning process, their opportunities to provide input on the drafting of the RDCP, and how the DPTF would keep them informed as RDCP development progressed. • Does the drought plan include consideration of climate change impacts to water resources or drought?

Yes, please see detailed response in Criterion B: Sustainability and Supplemental Benefits section 2. Ecological Value above.

• Describe how your proposed drought resiliency project is supported by and existing drought plan.

The proposed project implements Mitigation Actions identified in the North American Basin Regional Drought Contingency Plan including the new installation of a new groundwater well with injection. The recommended mitigation action including installation of new wells would enable CWD to maintain and increase its extraction capability. The enhanced groundwater capability would provide drought back supplies for the agency, as well as its neighboring agencies. Furthermore, installing new wells for injection would increase ability to recharge the groundwater basin. The enhanced groundwater basins conditions provides benefits to drought resiliency should surface water supplies become limited. Improving direct recharge capabilities also would create opportunities for groundwater banking and exchange.⁵

In the UWMP and WSCP the plan recommends and confirms that the District drought preparedness plan includes construction of new groundwater well as stated on page ES-5 "CWD is deeply committed to solving the critically dry year issue by expanding its access to surface water supplies and improving its conjunctive use activities." and on page 3-26 "Although the monthly vulnerability exists in the short-term water supply assessment, this 2020 UWMP assumes that the District will have resolved this issue by 2025 with additional groundwater capacities. The District plans to drill new wells and/or rehabilitate its backup supply well(s) as part of its regular water sources."⁶

Criterion D: Severity of Actual or Potential Drought Impacts to be addressed by the Project

The proposed project is located in the Sacramento County, California, in the western United States zone experiencing an exceptional drought as shown on the U.S. Drought Monitor, <u>http://droughtmonitor.unl.edu</u>, in Figure 4 below.

⁵ Regional Water Authority, North American Basin Regional Drought Contingency Plan, October 2017. Retrieved from https://rwah2o.org/wp-content/uploads/2017/11/NorthAmericanBasinRDCP_Oct_2017.pdf.

⁶ Tully, G.-M., Young, G., Olof, K., Davis, G., Bolland, D., Xu, J., McCarl, J., Nelson, C., Lee, C., & Medill, M. (2021). (rep.). 2020 Urban Water Management Plan. Carmichael Water District. Retrieved from

https://carmichaelwd.org/wp-content/uploads/2021/07/CWD-Final-06.30.21.pdf



Figure 4 – U.S. Drought Monitoring showing drought areas including California

In May, the Regional Water Authority (RWA) adopted a resolution calling for 10% conservation and Governor Gavin Newsom issued an executive order asking residents to reduce water use by 15% in 50 of California's 58 counties. On July 15, 2021, RWA's Board of Directors unanimously adopted another resolution urging its 20 members to take action to voluntarily reduce water use by a minimum 15%. The CWD Board declared a Stage 2 Water Shortage Emergency Condition at its June 24, 2021 Special Board meeting with 10 - 20% mandatory conservation per the District's Water Shortage Contingency Plan. The American River flows to the Sacramento River and ultimately to the Sacramento-San Joaquin River Delta. "The delta is the largest freshwater estuary on the West Coast and the hub of two massive water conveyance projects jointly operated by the state and federal government. The delta props the state's multi-billion-dollar farming industry and provides drinking water for an estimated 25 million people. With the state mired in its second driest two-year-period on record, the water board believes demand has outpaced supply on the state's largest rivers and that curtailing water rights was necessary to avert ecological disaster. The water board has issued similar curtailment orders in other watersheds but smaller in terms of impacted users compared to the delta prohibition."⁷

Drought conditions including the curtailment of access to the American River water supply creates a significant impact to CWD including impacts to recreational facilities and most notably reliable access to drinking water. Curtailment from American River constrains the District water supplies to 8.31 MGD of the 14.5 MGD maximum day demand, or just 57% of demand. This compels the District to issue a Water Shortage Emergency requiring increasing levels of mandatory conservation and procurement of emergency water supplies. A continued drought will have increasingly impactful consequences on the community of Carmichael without increased groundwater conjunctive use including a sustainable ASR management strategy. Continued drought conditions may eliminate opportunities to purchase out of District water supplies as the entire region is facing an Exceptional Drought and water resources are spread increasingly thin statewide.

Criterion E: Project Implementation

This project has three (3) primary phases including (1) Permitting and Application, (2) Well Design and Construction, and (3) Facilities Design and Construction. Each phase is broken into multiple sub-tasks as described below. The work phase descriptions below describe the work involved and detailed milestones and task descriptions, for simplicity the CWD team including the professional consultant support will be described simply as "CWD".

Phase 1. Permitting and Application

The required permitting and approvals are listed below in this section for reference, but the permit/approval specific details are provided in the "Required Permits and Approvals" section of this application to avoid redundancy.

1.1 Site Licensing Agreement, 1.2 CEQA & NEPA, 1.3 DWSA, 1.4 Well Permit Application, 1.5 Discharge Permitting, 1.6 Sanitary Sewer Discharge Application, 1.7 Storm Water Pollution Prevention, 1.8 Building Permit, 1.9 Electrical Power Application, and 1.10 System Operating Permit.

Phase 2 – Well Design and Construction

CWD's approach to well design and construction will combine exploration drilling (pilot hole) with final well construction. This approach expedites the construction, requiring only one contractor and a single mobilization to the site. It will require, after the pilot hole is drilled and site-specific information is acquired, to prepare a final design based on actual conditions. This is a common practice in the industry and one that contractors can accommodate. It will require CWD to provide rapid (1 day) approval of the final design to avoid construction delays.

⁷ Cahill, N. (2021, September 1). California water suppliers cast 1st challenge to strict drought rules. Courthousenews.com. Retrieved from https://www.courthousenews.com/california-water-suppliers-cast-1st-challenge-to-strict-drought-rules/.

2.1 Preliminary Well Design

CWD's consultant team will develop a preliminary design of the well using information contained within CWD's records for existing wells in the vicinity along with other wells constructed near the District. The purpose of this work is to identify the top of the Valley Springs Formation, potential aquifers, well yield and water quality and to use during the preparation of Tasks 1.1 through 1.3 and for preparation of the plans and specifications in Task 3.2. The design of the well will be developed using the most recent methodologies for ASR well construction including the use of a manufactured filter pack (Silica Beads). This effort will yield both a Draft and Final Domestic Preliminary Well Design Technical Memorandum.

2.2 Well Construction and Testing Plans and Specifications

CWD's consultants will develop drawings, specifications and a bid schedule for construction of the new well using information detailed in Task 2.1. The specifications will include detailed descriptions of the following:

- Operating hours
- Acceptable drilling methods and procedures
- Water available for drilling purposes
- Handling and characteristics of the drilling fluid
- Drilling program loss of circulation plan and approach
- Sanitary seal requirements
- Pilot and reamed borehole diameters and depths
- Sediment sampling
- Geophysical logging
- Length, diameter, slot size, and ASTM specification for the well casing and screen materials
- Preliminary filter-pack gradation
- Acceptable construction, development and production methods
- Production testing equipment and procedures
- Well disinfection procedures
- Drilling mud and cutting disposal

The specifications will also require the contractor to:

- Provide sanitary facilities
- Provide sound barriers
- Comply with NPDES discharge permit conditions
- Provide the necessary permits to drill and construct the well Submit copies of the well logs to Sacramento County Environmental Management Division and California Department of Water Resources in compliance with the well drilling permit

CWD will develop bid documents including technical specifications, invitation to bid, general conditions and specific conditions and an engineer's estimate for construction. CWD will

publically advertise the project in accordance with public contracting procedures. CWD will solicit bids for the work and contract directly with the contractor. CWD will host the pre-bid meeting, respond to bidder's questions, and prepare any required addenda. CWD will recommend award to the lowest responsive responsible bid to the CWD Board of Directors for approval.

2.3 Well Construction and Testing Oversight

CWD will provide construction oversight during the drilling of the borehole, well construction, testing, disinfection and final acceptance of the well. The following tasks are based on the assumption that the pilot borehole and the well being constructed to a depth of about 700 feet.

Pre-Construction Meeting: After the drilling contractor has been selected, CWD will attend a preconstruction meeting with the contractor to clarify the intent of the drilling, to determine what information the project manager will need, and to establish clear lines of communication. At this meeting, the contractor will also provide submittals that for review, approve, and accumulate for inclusion into the final report.

Construction Progress Meetings: Because the well construction and testing will last about six weeks, we anticipate there will be about six 30-minute meetings.

Submittal Review: CWD will review Contractor submittals and approve, accept with conditions, or reject.

Pilot Hole Logging: During the drilling of the pilot borehole, CWD staff will be on-site to coordinate contractor activities, log the drill cuttings and collect samples of the sediments, confirm the contractor is maintaining drilling fluid properties and observe and interpret the geophysical logging.

Final Well Design: Upon completion of the pilot hole drilling, geophysical logging and sediment sampling CWD will analyze the information and create a final well design for the contractor.

Pilot Hole Reaming: Prior to starting to ream the pilot hole the contractor will order the well construction materials and will coordinate delivery of the materials with completion of the pilot hole drilling. During reaming of borehole, staff will visit the site daily to monitor the contractor's progress and drilling fluid maintenance.

Well Construction: Staff will confirm that the materials used to construct the well comply with the specifications. Staff will be on-site continuously for the installation of the well casing and screens, gravel packing of the annular space and placement of concrete sanitary and annular seals. As-built well construction details will be prepared.

Well Development: The development of the well is a very important task because it removes drilling fluid and remnants from the annular space between the water-bearing sediments and the well screen. Staff will be on-site during the preliminary development to approve the methods used and to monitor the discharge water quality for discharge of water to the sanitary sewer. Based on the results of the preliminary development, staff will recommend whether to install the test pump and continue the development process.

Test Pumping: After the test pump has been installed, staff will be on-site to approve the methods used and near the end of the pump development process to witness the results at the start-up. Staff will also evaluate the water conditions and approve whether it can be discharged to surface water and to monitor the discharge water quality for NPDES permit compliance.

Staff will review the results of the pump development and based on these results recommend the pumping rate for the step-drawdown test. Our staff will be present continuously during the step-drawdown testing.

Our team will analyze the results of the step-drawdown test and recommend the pumping rate for the long-term pumping test, establishing the production capacity of the well.

During the long-term pumping test (24 hours), CWD will visit the site to start the test and observe the work procedures. At the completion of the long-term test, we will return to the site to make recovery measurements (a period of about two hours) and then after 24 hours to confirm the aquifer has fully recovered.

Near the end of the long-term pumping test, water quality samples will be obtained for Title 22 analyses, per DDW District Engineer. Staff will collect the samples and submit the samples deliver the samples to the CWD contract laboratory.

NPDES Monitoring and Reporting: During both the development and test pumping, effluent discharge monitoring will occur. Based on our experience, it is likely the discharge will occur over a two-month period. Per the Low Threat Discharge Permit, we will document the physical characteristics of the water for floating or suspended matter, discoloration, foam, and sheens or films. Staff will also collect four samples for analysis of Biochemical Oxygen Demand (BOD), suspended solids, settleable solids, and pH.

Most samples will be collected at the start of discharge.

We will also monitor the receiving water, as required by the permit, at locations upstream and downstream from the discharge on the American River when discharging. We anticipate water will be discharged over a two-month period but with durations lasting between three to five days each time.

Therefore, we have planned to monitor the river at start-up of the discharge and at a minimum of every four hours during daylight hours. Visual observations will be made along with field analysis for temperature, pH, electrical conductivity, and dissolved oxygen.

We anticipate the Low Threat Discharge permit will be active for a one-year period. Quarterly reports are required to be submitted to RWQCB even if no discharges were made during that quarter. Staff will prepare quarterly monitoring reports. A District representative will sign the reports before submitting them to the RWQCB. At the completion of the project CWD will prepare a letter to request RWQCB close the permit.

Should CWD decide to use our existing NPDES permit for Drinking Water Systems this task can be reduced, as the reporting of the discharge will be performed by staff in the annual report.

Final Well Inspection: After the completion of aquifer testing and the removal of all equipment from the well, staff will be on-site to observe the alignment testing and the disinfecting of the well and to document the results. We will analyze the plumbness test for conformance with the specifications and calculate the effective diameter at the pump setting. Upon completion of this work, staff will witness the video log survey and assess if there has been any damage caused by the contractor's activities.

Well Disinfection: After the completion of final well inspections the contractor will be required to disinfect the well with chlorine. Staff will be on-site to observe the disinfection procedures. The chlorinated solution will be allowed to remain in the well.

Contractor Invoice Review: Staff will review contractor invoicing for accuracy and actual units used and pay or reject the invoice (with instructions to resolve).

Well Completion Report: CWD consultants will summarize the results of the well construction and testing in a Well Completion Report. This report will present the lithologic log of the pilot hole; the geophysical logs; the as-built well construction details; the results of the production, plumbness, and alignment tests; and recommendations for the long-term pumping rate of the well. CWD will then use the report to make any adjustments to the final engineering design for the pumping plant. Pilot hole drilling is anticipated to take no more than 4 days to complete.

Phase 3. Facilities Design and Construction

The facilities will be designed concurrent with design and construction of the well. The specification will be based on the well being able to produce 1,500 GPM, with final adjustments to pump and motor selection after completion of the test pumping and once the flow rate and drawdown is verified.

3.1 Preliminary Facilities Design

CWD will survey within the District's parcel and extending 25' ± beyond the parcel boundary. Field survey will field locate visible improvements and produce a composite archival base map with the topographic information. Using this information CWD will prepare a preliminary site plan for all existing and projected facilities and projected facilities. CWD consultants will develop a preliminary design report summarizing the proposed improvements for equipping the well; pump and motor sizing, mechanical improvements, chemical feed system, pump control strategy, and electrical improvements. The preliminary design report will summarize all design criteria.

3.2 Facility Plans and Specifications

This task includes the development of a set of improvement plans for equipping the newly constructed well and includes creating a complete set of written construction specifications for equipping the well.

The well equipping design will include the following:

Improvement Plans for Equipping Well and Site Design – This task includes the following items:

• Cover Sheet

- Grading and Drainage (including existing and proposed elevations extending 25 feet beyond the property lines)
- Site Development
- Mechanical Plans and Details
- Chemical Feed System Plans and Details
- SMUD Application and Submittal Package (Task 1.8)
- Electrical Plans and Details
- Instrumentation and Controls (SCADA) and Integration
- Generator Plan and Connection Details
- Operation Memorandum and Schematic Diagram
- A prefabricated building will be specified to house the chemical feed system. The well and the motor control panel will not be enclosed in a building.

CWD will make program modifications to their SCADA system to incorporate the new well. CWD has a hydraulic flow model and will simulate the well in an extraction mode and in an injection mode to confirm that no low pressures occur. Chemical feed systems are likely required only for chlorine.

3.3 Bidding and Award

CWD will advertise the project bid package, respond to all bidder's inquiries, prepare addenda to the bidding documents as necessary, and host the pre-bid meeting and bid opening. CWD staff will provide the CWD Board with recommendations for awarding the construction contract for approval.

3.4 Construction and Construction Management

CWD consultants and staff will provide construction management services for the successful completion of equipping the well on schedule and within budget. The following specific tasks will be completed:

- Attend pre-construction meetings, review construction schedule.
- Monitor all construction activities and provide a written report weekly.
- Review Contractor submittals for conformance to the design drawings and specifications.
- Review and respond to Contractor's Requests for Information (RFI).
- Issue field memo's and respond to request for clarification as required.
- Review Contractor change orders and negotiate potential change orders.
- Review Contractor progress payment requests and provide recommendations for payment.
- Provide line and grade stakes for new pipelines, edge of new pavement, edge of new concrete, and other new structures per design plans.
- Perform start-up and commissioning operations, attend contractor walkthroughs, final inspections and testing.
- Prepare record drawings depicting as-built conditions in AutoCAD (latest version).

- Complete an Operation and Maintenance Manual this task includes working with operations staff to develop a draft operations plan for the well operations and maintenance. Incorporate input from District staff to develop final operations plan.
- District staff will perform trenching, installation of pipe connecting the pumping plant to the distribution system and disinfection, compaction and resurfacing of the trenches.
- As-builts/redline mark-up, and a Operation and Maintenance Manual.

Phase 4. Project Closeout

4.1 Performance Monitoring Period

CWD will measure, track and record daily well production and evaluate the project performance for a period of 60-90 days.

4.2 Project & Grant Final Closeout and Reporting

CWD will complete all project closeout tasks including complete all financial reporting, and complete all project reporting.

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	Start	11/21	12/21	2/22	12/21	12/21	3/22	5/22	5/22	3/23	11/21	12/21	4/22	11/22	2/22	6/22	9/22	5/23	8/23
	Task Name	1.1 CEQA & NEPA	1.2 Drinking Water Source Assessment	1.3 Well Permit Application	1.4 Discharge Permitting	1.5 Sanitary Sewer Discharge Application	1.6 Storm Water Pollution Prevention	1.7 Building Permit	1.8 Electrical Power Application	1.9 System Operating Permit	2.1 Preliminary Well Design	2.2 Well Construction and Testing Specifications	2.3 Well Construction and Testing Oversight	3.1 Preliminary Facilities Design	3.2 Facilities Plans and Specifications	3.3 Bidding and Award	3.4 Construction & Const. Mgmt	4.1 Performance Monitoring Period	4.2 Project & Grant Final Closeout and Reporting

Criterion F: Nexus to Reclamation

CWD participated in the North American Basin Regional Drought Contingency Plan (RDCP), completed in fall 2017, as it was a collaborative planning effort supported by a grant through the U.S. Department of the Interior, Bureau of Reclamation's (Reclamation) WaterSMART Drought Response Program that provides a proactive approach to building long-term resiliency to drought. The RDCP began the process of identifying vulnerabilities and mitigation actions for many RWA member agencies, which served as the foundation of the planning process for the RWRP.

Does the applicant have a water service, repayment, or O&M contract with Reclamation?

The applicant does not have a direct water service, repayment, or O&M contract with Reclamation.

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

CWD contracted with SJWD to provide supplemental surface water supply during the 2021 CWD curtailment from its post-1914 water rights to the American River. SJWD has a contract for upto 24,200 AF of CVP water, pursuant to a long-term water service contract that expires in 2045, but which is subject to renewal. CWD and SJWD have contracted to provide CWD temporary supplemental surface water supplies to mitigate the severe drought implications to CWD from the curtailment order.

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

This project is linked to Reclamation Mid-Pacific Region facilities and activities at Folsom Reservoir as CWD has water rights to the American River which is downstream of Folsom Dam. The reduction of surface water usage by utilization of the groundwater source has the potential to provide benefit to these facilities during drought conditions. All surface water diversions of CWD and its collaborative regional partners are taken primarily from the American River with additional diversions from the Sacramento River. Conjunctive Use in the region has a potentially beneficial impact to Reclamation facilities and Folsom Lake water storage.

Is the applicant a tribe?

CWD is a Special District and not a tribe.

Project Budget

Funding Plan

The proposed project will be funded by the District's Capital Improvement Plan Fund. The budget for this fund for Fiscal Year 2021-2022 is \$7.8 million dollars. The District has enough funding in this year's budget for the proposed project and will make the available funding as part of the cost-share contribution. There will be no in-kind contribution by other parties.

Budget Proposal

The total cost of the project is estimated to be \$5,000,000.00, as shown in Table 1. The project funding sources are \$3,000,000.00 from CWD and \$2,000,000.00 from Reclamation, as showin in Table 2. Please note that the grant reimbursable project costs are \$4,500,000.00 of which Reclamation's share is \$2,000,000 (44%) and the District's share is \$2,500,000.00 (56%), as shown in Table 3 Total Project Cost Summary. The funding source is shown in Table 2 Non-Federal and Federal Funding Sources Summary.

Table 1. Total Project Cost Summary

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal Funding	\$2,000,000.00
Costs to be paid by the applicant	\$3,000,000.00
Value of third-party contributions	\$0.00
Total Project Cost	\$5,000,000.00

Table 2. Non-Federal and Federal Funding Sources Summary

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. Carmichael Water District	\$3,000,000.00
Non-Federal Subtotal	\$3,000,000.00
REQUESTED RECLAMATION FUNDING	\$2,000,000.00

The project costs include Land Acquisition, Permitting and Application Fees, Project Design, Well Construction, Facility Construction, and Construction Management. The Land Acquisition costs and the Project Design costs are not noted as eligible for grant reimbursement as Land Acquisition is not eligible, and CWD has contracted and started project design prior to grant application. Table **3** provides budget items descriptions for the project cost estimate.

Table 3. Budget Proposal

Budget Item Description	Quantity	Unit	Unit Cost	Total	Total Cost	Reclamation Share	CWD Cost Share
Land Acquisition (not elidgible)							
Legal Fees	1	LS	\$15,000.00	\$15,000.00			
Survey Plat & Legal	1	LS	\$15,000.00	\$15,000.00			
Land Purchase	1	LS	\$70,000.00	\$70,000.00			
Land Acquisition Sub-Total					\$100,000.00		\$100,000.00
Permitting, Application & Misc. Fees	10	EA	\$5,000.00	\$50,000.00	\$50,000.00		\$50,000.00
Contractual					1		
Project Design (not elidgible)	4	10	¢50.000.00	¢50.000.00			
Permitting & Application Support	1	LS	\$50,000.00	\$50,000.00			
Eacilities Design & Engineering Services During Construction	1	15	\$125,000.00	\$125,000.00			
Project Design & Engineering Services During Construction	1	LJ	3223,000.00	3223,000.00	\$400.000.00		\$400.000.00
Well Construction					\$400,000.00		\$400,000.00
Mohilization/Demohilization & Cleanup	1	15	\$125,000,00	\$125,000,00			
Site clearing & grubbing	1	LS	\$12,500.00	\$12,500,00			
Noise control barrier walls	1	LS	\$45,000.00	\$45,000.00			
Drill 48-inch borehole and Install Conductor Casing and Sanitary Seal	1	LS	\$50,000.00	\$50,000.00			
Drill pilot borehole	700	LF	\$125.00	\$87,500.00			
Perform Downhole Geophysical Surveys	1	LS	\$6,000.00	\$6,000.00			
Ream pilot borehole	650	LF	\$135.00	\$87,750.00			
Isolation Zone Acquifer Testing	4	EA	\$12,500.00	\$50,000.00			
Conduct Caliper Survey	1	LS	\$6,000.00	\$6,000.00			
Furnish & Install 18-inch diameter stainless steel blank sump	10	LF	\$750.00	\$7,500.00			
Furnish & Install 18-inch diameter stainless steel wire wrap well screen	350	LF	\$800.00	\$280,000.00			
Furnish & Install 18-inch diameter stainless steel blank casing	330	LF	\$750.00	\$247,500.00			
Furnish & Install 3-inch stainless steel gravel feed tube	310	LF	\$100.00	\$31,000.00			
Furnish & Install 2-Inch stallness steel sounding tube and junction box	330	10	\$90.00	\$29,700.00			
Furnish & Install 4-Inch stalliess steel video survey pipe and junction box	330	LF	\$200.00	\$66,000.00			
Furnish & Install sand cement grout sanitary seal	270	LF	\$130.00	\$27,000.00			
Perform two stages of well development	100	HR	\$500.00	\$50,000,00			
Mobilize pumping development	300	FT	\$50.00	\$15,000,00			
Perform pump development	60	HR	\$500.00	\$30,000.00			
Peform step-drawdown test by pumping	1	LS	\$5,500.00	\$5,500.00			
Perform constant-rate discharge test by pumping	1	LS	\$27,500.00	\$27,500.00			
Conduct a flow velocity survey	1	LS	\$8,250.00	\$8,250.00			
Complete final disinfection	1	LS	\$2,750.00	\$2,750.00			
Perform a video survey	1	LS	\$3,300.00	\$3,300.00			
Conduct well alignment/deviation test	1	LS	\$7,700.00	\$7,700.00			
Complete final capping	1	LS	\$1,320.00	\$1,320.00			
Disposal of drill cuttings by law	1	LS	\$16,500.00	\$16,500.00			
Standby Time	50	HR	\$500.00	\$25,000.00			
Furnish & Install Betonite Seal	100	LF	\$275.00	\$27,500.00			
Treffic Control	1	LS	\$11,000.00	\$11,000.00			
Title 22 water guality cample analysis	1	1.5	\$30,000.00	\$30,000.00			
Well Construction Sub-Total	1	LJ	\$5,250.00	\$3,230.00	\$1,500,000,00	\$750,000,00	\$750,000,00
Facility Construction					\$2,500,000.00	\$756,666,66	\$756,666,666
Mobilization/Demobilization & Cleanup	1	LS	\$ 125.000.00	\$ 125.000.00			
Supply/Install Well Pump and Appurtenances	1	LS	\$ 250,000.00	\$ 250,000.00			
Supply/Install No-Climb 8' Fencing & Powered Gate w/keypad	1	LS	\$ 60,000.00	\$ 60,000.00			
Supply/Install All Water System Piping & Appurtenances	1	LS	\$ 200,000.00	\$ 200,000.00			
Supply/Install All Storm and Drain Piping	1	LS	\$ 90,000.00	\$ 90,000.00			
Supply/Install All Chemical Feed System	1	LS	\$ 30,000.00	\$ 30,000.00			
Supply/Install All Pump-to-Waste, Flush-to-Waste, and Surge Relief Piping	1	LS	\$ 150,000.00	\$ 150.000.00			
and Appurtenances	_		+,	+			
Site Electrical, VFD, SCADA & Instrumentation	1	LS	\$ 850,000.00	\$ 850,000.00			
Site Improvements & restoration	1	LS	\$ 350,000.00	\$ 350,000.00			
Appurtenances	1	LS	\$ 250,000.00	\$ 250,000.00			
	1	15	\$ 50,000,00	\$ 50,000,00			
System Disinfection	1	15	\$ 5,000.00	\$ 5,000.00			
System Testing & Startup	1	LS	\$ 40.000.00	\$ 40.000.00			
Traffic Control	1	LS	\$ 50.000.00	\$ 50,000,00			
Facility Construction Sub-Total			1 +		\$ 2,500,000.00	\$1,250,000.00	\$1,250,000.00
Construction Management							
Project Engineer (8-hours a day for 7 months)	1120	Hours	\$160	\$179,200			
Inspector (9-hours a day for 6 months)	1000	Hours	\$120	\$120,000			
Well Drilling Overtime	1	LS	\$25,000	\$25,000			
Materials Testing	1	LS	\$50,000	\$50,000			
Job Site Trailer & Office Furnishings (7 months)	1	LS	\$50,800	\$50,800			
Travel, Supplies, Misc Reimbursible Expenses	1	LS	\$25,000	\$25,000			
Sub-Total			1		\$450,000		\$450,000
Table During to Count Sticitile Court					64 F05 555	43 055 555 55	An Free and
Total Project Grant Eligible Cost					\$4,500,000.00	\$2,000,000.00	\$2,500,000.00
Total Project Cost			1		\$5,000,000.00	\$2,000,000.00	\$3,000,000.00
Total Project Cost (%)			1			44%	50% 60%

Budget Narrative

Salaries and Wages

No salary and wages are included in the project budget.

Fringe Benefits

No fringe benefits are included in the project budget.

Travel

No travel expenses are included in the project budget.

Equipment

No equipment is included in the project budget.

Materials and Supplies

No materials and supplies is included in the project budget.

Contractual

There are four (4) contracts proposed in the project budget including Project Design, Well Construction, Facility Construction and Construction Management.

1. Project Design \$400,000.00 (not reimbursable)

The Project Design contract was executed prior to grant application and is **not included for grant reimbursement in the project budget** and will be fully funded by the applicant. The design contract includes three primary tasks including Permit and Application support for \$50,000.00, Well Design and Testing for \$125,000.00, and Facilities Design & Engineering Services during Construction. The total contract cost is estimated at \$400,000.00.

2. Well Construction Contract \$1,500,000.00

The Well Construction Contract is based on both typical construction costs and recent 2021 bid values from a well project within 15 miles of the project. The Well Construction Contract includes the bid items and costs that are customary with furnishing and installing all components of a functional well. The Well Construction Contract is estimated at \$1,500,000.00. Although the estimate utilizes recent comparable bid costs, the local construction contracting market including labor, material and supply chain disruptions due to the pandemic has in some cases triggered price escalation of up to 100% year over year, and cost estimation is difficult at this time and therefore a 10% contingency is included.

3. Facilities Construction Contract \$2,500,000.00

The Facilities Construction Contract is based on both typical construction costs and recent 2021 bid values from a well project within 15 miles of the project. The Facility Construction Contract includes the bid items and costs that are customary with furnishing and installing all components of a functional well site including the well pump with a variable frequency drive, SCADA and instrumentation, electrical work, perimeter fencing, water system piping, storm drain piping, chemical feed system, backup generator, and the required electrical

work. The contract also includes normal construction costs including mobilization and demobilization and SWPPP. The contract also includes disinfection prior to providing potable water service as well as startup system testing support. The Facility Construction Contract is estimated at \$2,500,000.00. Although the estimate utilizes recent comparable bid costs, the local construction contracting market including labor, material and supply chain disruptions due to the pandemic has in some cases triggered price escalation of up to 100% year over year, and cost estimation is difficult at this time and therefore a 10% contingency is included.

4. Construction Management Contract \$450,000.00

The Construction Management contract includes two full time contract staff including a Project Engineer and Inspector, an allowance for overtime during the non-stop well drilling, materials testing expenses, a job site trailer including office furnishings of two computers, air conditioning, conference table, gender neutral bathroom, other project related reimbursable expenses. The Construction Management contract cost is estimated at \$450,000.000.

Third-Party In-Kind Contributions

No Third-Party In-Kind Contributions are included in the project budget.

Environmental and Regulatory Compliance Costs

Permitting, Application & Miscellaneous Fees \$50,000.00

The Environmental and Regulatory Compliances costs are included in the project budget as Permitting, Application and Miscellaneous Fees for a total of \$50,000.00. There are ten (10) permits and/or approvals identified in the Required Permits and Approvals section of the application. The list includes Site Licensing Agreement, CEQA & NEPA, DWSA, Well Permit Application, Discharge Permitting, Sanitary Sewer Discharge Application, Storm Water Pollution Prevention, Building Permit, Electrical Power Application, and System Operating Permit. Each permit and approval is estimated at a cost of \$5,000.00 for a total of \$50,000.00.

Others Expenses

Land Acquisition (not reimbursable) \$100,000.00

Land Acquisition expenses are **not included in the project budget for reimbursement**. The land acquisition costs include \$15,000 for legal expenses, \$15,000 for Survey work related to the Plat and Legal Description of the site property, and \$70,000 for the purchase price for the site payable to the San Juan Unified School District.

Indirect Costs

Indirect costs are not included in the project budget.

Environmental and Cultural Resources Compliance

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

The project will not impact the surrounding environment as any potential impacts will be mitigated. The existing site is a developed grass field adjacent to a paved parking lot. The project includes well drilling, minor grading, utility trenching up to 6 FT deep, fencing installation and minor paving. Every reasonable precaution will be exercised to protect surface waters from pollution related to construction activities. Construction operations will be scheduled and conducted so as to avoid or minimize muddying and silting of surface waters. Specific procedures to be followed and protective measures to be installed to ensure that water pollution to streams, waterways, and other bodies of water do not become polluted by sediment or other substances during construction. Construction of the project would be covered under California's Construction Stormwater General permit which requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

To prevent the generation of dust, unpaved areas where vehicles are operated will be periodically wetted down or given an equivalent form of treatment. To control air pollution other than dust, the following procedures will be followed:

- All volatile liquids, including fuels and solvents, will be stored in closed containers.
- Open burning of debris, lumber, or other scrap will not occur.
- Equipment will be properly maintained to reduce gaseous pollutant emissions.
- 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?

CWD is not aware of any species or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area. Per project Task 1.1 CEQA & NEPA, A CWD consultant biologist will review online databases to develop a list of special-status species with potential to occur in the Project area or may be affected by the Project prior to visiting the site. This list will inform the biologists on the types of resources they should be seeking when visiting the site. See Task 1.1 CEQA & NEPA in the Technical Project Description for more information.

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

There are no wetlands or other surface water inside the proposed project area that fall under Clean Water Act jurisdiction as "Waters of the United States". The area is a developed recreational lawn area that is actively irrigated, maintained and mowed regularly.

• When was the water delivery system constructed?

The origin of Carmichael Water District (District) dates to July 3, 1915 when the Carmichael Colonies Improvement Club appointed a committee to investigate the possible formation of an irrigation district to address the growing water needs of the Carmichael Colony. The water delivery system has been expanded and developed since 1915. The water pipe installed on Engle Road was constructed in 1944 and the water pipe installed on Garfield Avenue was constructed in 1957.

• 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.

No this does not include modifications to an irrigation system.

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

CWD is not aware of any buildings, structures, or features in the project area listed or eligible for listing on the National Register of Historic Places. For cultural resources, a Registered Professional Archeologist will identify previously recorded archaeological or historic sites within the study area by contacting the local Reclamation office and the Native American Heritage Commission (NAHC), requesting a review of their Sacred Lands Files for the project site and a list of Native American organizations and individuals that may have religious or cultural affiliation with the Project area. CWD will prepare a letter for each organization and individual on the NAHC list to provide them with information about the Project and how to comment on the IS. Tribal consultation will be conducted by CWD staff.

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

There are no known archaeological or culturally sensitive sites within the project limits. If unrecorded archaeological or culturally sensitive sites are discovered during construction, the discovered item will be protected from damage or destruction, work in the immediate vicinity of the site will be stopped, the perimeter of the site will be clearly marked, and the District will be promptly notified so that the find can be evaluated and appropriate mitigation actions can be performed.

There are no known prehistoric or historic subsurface cultural resources at the project location. This is developed recreational landscaped site with regular landscape maintenance. In the event that any prehistoric or historic subsurface cultural resources are discovered during constructionrelated earth-moving activities, all work shall be halted and a qualified archeologist (or paleontologist) will be consulted to assess the significance of the find. If any find is determined to be significant by the archeologist, CWD and the archeologist shall determine the appropriate course of action. If the discovery includes human remains of Native American origin, CWD would coordinate activities with the Native American Heritage Commission. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curator, and a report prepared by the archeologist, according to current professional standards. With these actions, there will be a less than significant impact.

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

No the proposed project will not have a disproportionately high and adverse effect on low income or minority populations. The project will provide more reliable water service to the local community a whole.

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

No the proposed project will not limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands. The site was previously developed.

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

Required Permits and Approvals

Phase 1. Permitting and Application

Several permits, applications and approvals are needed prior to starting construction of the well. The permits and approvals anticipated at this time are:

- Licensing Agreement and Land Swap with San Juan Unified School District
- CEQA, Negative Declaration or Mitigated Negative Declaration
- NEPA, Finding of No Significant Impact or Environmental Impact Statement
- Drinking Water Source Assessment (DWSA) draft and final Corporate Yard Well
- Well Permit
- National Pollutant Discharge Elimination System (NPDES) Low Threat Discharge Permit
- Sacramento Regional County Sanitation District Temporary Discharge Permit
- Sacramento County Storm Water Permit and Under-an-Acre SWPPP

Permits required for the construction of the facilities include:

- Building Permit (can be administered by the District)
- Sacramento Municipal Utilities District (power)
- Sacramento County Storm Water Permit and Under-an-Acre SWPPP
- Sacramento County Tree Removal Permit

Permits and amendments for use of the well for both domestic water supply and for ASR purposes include.

- Domestic Water Supply Permit Amendment
- Statewide ASR General Order
- Class V Injection Well Permit

1.1 Site Licensing Agreement

District staff have engaged San Juan Unified School District (SJUSD) to negotiate property acquisition, and SJUSD staff management have expressed support of collaboration for the benefit of the Carmichael community. District and SJUSD legal counsels are finalizing the terms of a Site Licensing Agreement to provide CWD immediate property rights to allow the District access to begin well development activities. SJUSD and CWD are concurrently in final negotiations for property acquisition.

1.2 CEQA & NEPA

The proposed well and facilities construction meets the definition of a "project" as defined by Section 15378 of the CEQA Guidelines, which states that a: "Project means the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment..." Therefore, the project is subject to CEQA review.

CWD will prepare an Initial Study (IS) meeting the content and process requirements outlined in Sections 15060 through 15065 of the CEQA Guidelines. The purpose of the Initial Study is to determine if the project may have a significant impact on the environment and identify ways to reduce these impacts early in the planning process. This initial screening analysis will be based on the use of threshold questions contained in the Environmental Checklist Form found in Appendix G of the CEQA Guidelines. If any potentially significant impacts are found, the CWD will implement mitigation measures to reduce the impact to a level considered to be less than significant, where feasible.

CWD will begin the process by developing a draft project description for use in the IS. The project description will include maps and drawings showing the proposed location of the well and facilities, describe pipeline construction activity, construction laydown areas, and identify the length of construction activity.

CWD will conduct the environmental evaluation. CWD will prepare responses to each IS checklist question using information obtained from readily available sources including review of existing planning documents, database search, and limited field investigation covering cultural and biological resources.

Before field investigations are conducted, CWD will review existing documentation pertinent to cultural and biological resources within the Project area. For cultural resources, a Registered Professional Archeologist will identify previously recorded archaeological or historic sites within the study area by contacting the Native American Heritage Commission (NAHC), requesting a review of their Sacred Lands Files for the project site and a list of Native American organizations and individuals that may have religious or cultural affiliation with the Project area. CWD will prepare a letter for each organization and individual on the NAHC list to provide them with information about the Project and how to comment on the IS. Tribal consultation will be conducted by CWD staff.

A CWD consultant biologist will review online databases to develop a list of special-status species with potential to occur in the Project area or may be affected by the Project prior to visiting the site. This list will inform the biologists on the types of resources they should be seeking when visiting the site.

CWD consultant planning staff will conduct a desktop review of the property using aerial photography and existing datasets available online along with general plan maps and other relevant planning documents to develop the environmental setting. Areas of focus include identification of sensitive land uses on and adjacent to the project site, determining the presence of geologic hazards or paleontological resources, and identification of utility and services that may be affected by project construction. Information on hazardous material releases into the environment near the yard gathered during Task 1.2 will be incorporated into the responses to checklist questions involving hazardous materials.

An administrative draft Initial Study/Negative Declaration (or Mitigated Negative Declaration) will be prepared. The final prepared for submission to the State Clearinghouse. CWD will prepare

the Notice of Completion and Summary Form and create the 15 CDs for submittal to the State Clearinghouse.

Following the 30-day public comment period, the District will respond to comments, and prepare a Mitigation Monitoring Reporting Program, if appropriate. Once CWD approves the project, a Notice of Determination will be submitted to Sacramento County and the State Clearinghouse within five days of the decision.

In addition to CWD's obligations under CEQA, the project is subject to federal agency approval if partially funded by Federal funds. This project requires the federal agency to conduct a National Environmental Policy Act (NEPA) review. In many ways this review is similar to the CEQA review and often these reviews are coordinated as a cost and time savings measure. Under NEPA an Environmental Assessment is prepared to determine whether the project may have a significant effect on the environment. If one or more significant effects are identified, an Environmental Impact Statement (EIS) is prepared. It not, then a Finding of No Significant Impact (FONSI) is prepared.

1.2 DWSA

Drinking Water Source Assessments (DWSAs) are required by the DDW for permitting a well as a source of drinking water supply. DDW recommends that a DWSA be prepared and submitted prior to the construction of the well. CWD consultants will use DDW excel-based spreadsheets, which automatically provide rankings of the PCAs, to develop the Draft DWSA.

The DWSA consists of five components: 1) a Well Data Sheet; 2) a Protection Zone Delineation map showing the area that the well will draw water from after 2, 5, and 10 years; 3) a Physical Barriers evaluation; 4) an identification of potentially contaminating activities (PCAs) within each protection zone; and 5) a vulnerability assessment and summary.

CWD will develop the Well Data Sheet, which contains the pertinent information to develop the Physical Barriers and Protection Zone Delineation zones. CWD will rely on the test hole well log and preliminary well design for this initial work. CWD will use Sacramento Groundwater Authority's most recent Basin Management Report to obtain a groundwater gradient allowing the use of the Modified Radius Method for projecting the Protection Zones that will likely shift the protection zones so that the NDMA contamination plume will not occur in any of the zones. Once completed, CWD will perform a drive-by canvas of the streets within each Protection Zone to perform a complete inventory PCAs.

CWD will request DDW to open a DWSA file and provide official documents. CWD will prepare and deliver a Draft DWSA to DDW. After the well is constructed, CWD will prepare the Final DWSA in word documents supplied by DDW.

The Final DWSA will be include an updated the Well Data Sheet including actual tested well yield, facilities construction components, and as-built construction details. CWD will transmit the Final DWSA to DDW approximately 2 months after the well is constructed.

In addition to preparation of the DWSA, DDW will require a drawing showing a detailed drawing of the location of storm drains, sanitary sewers, and security fencing to illustrate that the location of the new well is in accordance with required setbacks. CWD will prepare this drawing.

The Final DWSA will be provided within two months after the well is completed.

1.3 Well Permit Application

A permit to drill the well is required from the Sacramento County Environmental Management Division (SCEMD). The permit can be applied for by the District but will have to be signed by the Contractor once selected. The permit process includes SCEMD requesting consultations with the Regional Water Quality Control Board and other agencies for contamination issues and to obtain their approval to provide a permit. SGA will also be consulted to verify that even with this new well the subbasin will remain within its sustainable yield. CEQA needs to be demonstrated to be completed or in progress. CWD will prepare the permit application and then sign and submit to SCEMD. CWD will submit the application and pay for required permit and inspection fees.

1.4 Discharge Permitting

There are two options that the District can use to allow discharge of water during development and testing of the new well. One is to obtain a new NPDES Low Threat permit or the second is to use the District's existing NPDES permit for Drinking Water Systems.

CWD will prepare an application for a NPDES Permit for Low Threat Discharges to Surface Waters. This permit will be used to obtain approval from the Regional Water Quality Control Board, Central Valley Region (RWQCB) for water to be discharged during development and production testing of the new well.

CWD will submit two copies of the final NPDES application, permitting fees and the application to the RWQCB. Approval of the permit typically takes about 30 to 60 days.

Instead of preparing an application for a Low Threat NPDES Discharge Permit, CWD has a NPDES permit for Drinking Water Systems which allow discharges from construction of new wells, with allowable turbidity of up to 100 Nephelometric Turbidity Units (NTUs). CWD could request a modification of their existing permit to add the Corporate Yard Well site to the permit.

Use of CWD's existing permit could allow this task to be eliminated from the project scope of work. This would also reduce some portions of the Construction Management and Inspection tasks for the quarterly reporting as CWD would document the discharge in their annual report.

NPDES monitoring requirements are similar for both types of permits. The appropriate process will be selected that is most beneficial to the project cost and schedule.

1.5 Sanitary Sewer Discharge Application

Water generated during the drilling, construction and development of the well will typically be too turbid to be able to be disposed of to surface water. Therefore, obtaining a permit to discharge water to the sanitary sewer reduces costs to transport and dispose of the water. CWD will prepare an application for a temporary Discharge Permit to the Sacramento Regional County Sanitation District to discharge turbid thin-down and air-lift water to the sanitary sewer. CWD will arrange to pay for Sacramento Regional County Sanitation District (SRCSD) permit fees and water disposal costs directly with SRCSD.

1.6 Storm Water Pollution Prevention

Because the drilling and construction of any facilities could lead to storm water pollution a permit will need to be acquired and a storm water pollution plan will need to be developed. CWD will require the drilling contractor and the facilities contractor to obtain these permits. The contractor prior to start of construction will obtain this permit and develop a storm water pollution plan.

1.7 Building Permit

Construction of the pumping plant facilities would require a building permit. Because CWD is a public agency and the facilities are on their property CWD can avoid applying for the permit and self-administer. CWD will need to confirm this aspect, whether to contract with the County and/or self-administer, with Sacramento County prior to the initiation of facility construction.

1.8 Electrical Power Application

Electricity will be needed to power the motor and appurtenances. An application will need to be submitted to SMUD for them to confirm there is adequate power and to design and install power cables and transformers. CWD to prepare application and coordinate with SMUD.

1.9 System Operating Permit

CWD has a permit from DDW to operate the system and supply water from approved sources.

The permit will need to be amended to allow use of the new well. The amendment will require the submittal of well construction and facility as-built drawings, Title 22 water quality analysis, and CEQA. CWD will prepare the amendment along with the supporting to submit to DDW to amend their existing permit. This effort will yield a Final Domestic Water Supply Permit Amendment.

Existing Drought Contingency Plans

2020 Urban Water Management Plan & 2020 Water Shortage Contingency Plan

The Urban Water Management Planning Act (UWMPA) requires urban water suppliers in California with more than 3,000 connections to prepare an urban water management plan. CWD prepared the District's 2020 UWMP consistent with the UWMPA. The 2020 UWMP provides a framework for water planning to minimize the negative effects of potential water shortages, describes conservation achievements, and provides useful information to the public about the District and its water management programs.

The UWMPA added many new requirements for the 2020 UMWP update and the California Department of Water Resources UWMP 2020 Guidebook recommended several new items be considered in the District's 2020 UWMP. For example, the UWMPA requires a five year Drought Risk Assessment that critically analyzes supplies as compared to demands. The 2020 Guidebook recommended examining the supplies and demands on a monthly basis to address changed conditions that may apply to each water asset. In addition, the UWMPA requires the District to develop six standard water shortage levels in its 2020 Water Shortage Contingency Plan (WSCP). The District has followed these protocols and analyzed its water assets, water demands, and WSCP to meet the statutory requirements and Guidebook recommendations.

The CWD 2020 Urban Water Management Plan and the 2020 Water Shortage Contingency Plan are attached as Appendix A, Existing Drought Contingency Plan.

North American Basin Regional Drought Contingency Plan, October 2017

The North American Basin (NAB) Regional Drought Contingency Plan (RDCP) study area is located around the lower portion of the American River. The American River is a major tributary to the Sacramento River. The American River's watershed includes the cities of Sacramento, Roseville, Lincoln, Folsom, Rancho Cordova, Auburn and Placerville. The RDCP and associated planning are meant to be part of an adaptive process that is routinely updated to reflect the evolving needs in the region. The RDCP Planning Leads recognize the importance of continuous coordination with Reclamation in all aspects of implementing the RDCP. The RDCP includes sections covering Drought Monitoring, Drought Vulnerability Assessment, Drought Mitigation Actions, Drought Response Actions, as well as Operational and Administrative Framework and the Update Process.

Letters of Support

CWD received letters of support from the Regional Water Authority, San Juan Water District and Sacramento Suburban Water District (SSWD). The Regional Water Authority is a joint powers authority representing two dozen water providers and affiliates in the greater Sacramento region. The San Juan Water District is a water provider in the RWA. The Sacramento Suburban Water District is a water provider in the RWA.

Regional Water Authority Building Alliances in Northern California 5620 Birdcage Street Suite 180 Citrus Heights, CA 95610 Tel: (916) 967-7692 Fax: (916) 967-7322 www.rwah2o.org



September 27, 2021

Scan Bigley, Chair Dan York, Vice Chair

Members

California American Water Carmichael Water District Citrus Heights Water District Del Paso Manor Water District El Dorado Irrigation District Elk Grove Water District Fair Oaks Water District Folsom, City of Golden State Water Company Lincoln, City of Orange Vale Water Company Placer County Water Agency Rancho Murieta Community Services District Roseville, City of Sacramento, City of Sacramento County Water Agency Sacramento Suburban Water District San Juan Water District West Sacramento, City of Yuba City, City of Associates

County of Placer

El Dorado County Water Agency

Sacramento Area Flood Control Agency Sacramento Municipal Utility

District

Sacramento Regional County Sanitation District

Cathy Lee Carmichael Water District 7837 Fair Oaks Blvd Carmichael, CA 95608

Subject: Support for the New Groundwater Well at Engle/Garfield Project

Dear Mrs. Lee,

On behalf of the Regional Water Authority (RWA), I am pleased to express support for the Carmichael Water District's (CWD) New Groundwater Well at Engle/Garfield Project. The project will promote conjunctive use of surface water and the groundwater in the North American Subbasin (Subbasin) of the Sacramento Valley Groundwater Basin.

The well could be operated during high-demand and drought periods to supplement the seasonally limited surface water supplies and equipped with Aquifer Storage and Recovery (ASR) capabilities allowing excess surface water to be injected into the well and stored underground during wet periods for groundwater recharge. This conjunctive use strategy will provide substantial local and regional water supply management benefits, while providing environmental benefits of preserving surface waters in our rivers during dry conditions.

As CWD was participant in the Bureau of Reclamation-approved 2017 North American Basin Regional Drought Contingency Plan (RDCP) and partner with the RWA, we support the CWD New Groundwater Well at Engle/Garfield Project. The project helps implement key mitigation strategies identified in the RDCP to increase conjunctive and to use the groundwater basin as a storage reservoir for drought conditions.

Sincerely.

James Peifer **Executive Director**



P.O. Box 2157 | 9935 Auburn Folsom Road | Granite Bay, CA 95746 | 916-791-0115 | sjwd.org

Directors Edward J. "Ted" Costa Marty Hanneman Kenneth H. Miller Dan Rich Pamela Tabin

> General Manager Paul Helliker

October 1, 2021

Cathy Lee Carmichael Water District 7837 Fair Oaks Blvd Carmichael, CA 95608

Subject: Support for the New Groundwater Well at Engle/Garfield Project

Dear Mrs. Lee,

I am writing this letter to express support for the Carmichael Water District's (CWD) New Groundwater Well at Engle/Garfield Project. The project will promote conjunctive use of both the American River surface water and the groundwater of the North American Subbasin (Subbasin) within the Sacramento Valley Groundwater Basin.

The well could be operated during high-demand and drought periods to supplement the seasonally limited surface water supplies and equipped with Aquifer Storage and Recovery (ASR) capabilities allowing excess surface water to be injected into the well and stored underground during wet periods for Subbasin groundwater recharge. This conjunctive use strategy will provide substantial local and regional water supply management benefits.

As a regional water supply stakeholder and partner in the Regional Water Authority our agency supports the CWD New Groundwater Well at Engle/Garfield project. Forward thinking management strategies have advanced conjunctive use, managed use of both surface water and groundwater, in the region resulting in stabilized and sustainable groundwater levels while providing environmental benefits of preserving surface waters in our rivers.

Sincerely,

and Alliker

Paul Helliker General Manager

General Manager

Daniel R. York



Board of Directors

President - Robert P. Wichert Vice President - Craig M. Locke David A. Jones Kathleen McPherson Kevin M. Thomas

October 1, 2021

Cathy Lee Carmichael Water District 7837 Fair Oaks Blvd Carmichael, CA 95608

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Sincerely,

Dan York General Manager Sacramento Suburban Water District

3701 Marconi Avenue, Suite 100 • Sacramento, CA 95821-5346 • Phone 916.972.7171 • Fax 916.972.7639 • sswd.org

Official Resolution

Carmichael Water District staff have received direction from the District Board of Directors to schedule an agenda item for the WaterSMART Drought Response Program: Drought Resiliency Project for Fiscal Year 2022 grant application official resolution adoption on October 19, 2021. CWD staff will email the official resolution to <u>bor-sha-fafoa@usbr.gov</u> prior to November 1, 2021.