AEWSD Forrest Frick Pipeline
KDWD East Side Canal Intertie

Request for Funding Opportunity Announcement No. BOR-DO-20-F002

U.S. Department of the Interior, Bureau of Reclamation

WaterSMART Drought Response Program: Drought Resiliency Projects for FY2021

Applicant:
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Table of Contents

List of Figures

List of Tables

Appendices

Executive Summary

The Arvin-Edison Water Storage District (AEWSD) in Arvin, Kern County, California is applying for federal funds from the USBR WaterSMART Drought Resiliency Grant Program FY2021 BOR-DO-20-F002 due August 5, 2020 to construct the AEWSD Forrest Frick Pipeline (FFP) East Side Canal Intertie Project (Project). The new intertie between the AEWSD FFP and Kern Delta Water District's (KDWD) East Side Canal is supported by the neighboring water district, severely disadvantaged community, and local landowners because it is a critical drought relief project. Kern County has experienced a variety of drought impacts, most recently in 2014-2016, when surface water, groundwater, and drinking water supplies were in a terrible shortage. Construction of an intertie will increase the reliability of water supply, enhance groundwater conditions, and provide assurance to all groundwater users, including the Arvin Community Services District (ACSD), especially during drought periods. This Project was identified in the AEWSD & ACSD Groundwater Sustainability Plan and aligns with AEWSD's Drought Management Plan by increasing annual average water supplies by approximately 1,900 acre-feet. Project construction on this non-Federal facility will commence after the 2021 water season and last approximately 4 months, estimated October 2021 through January 2022.

Project Location

The FFP East Side Canal Intertie Project is located in Kern County, CA, 2 miles southeast of the City of Bakersfield and 4 miles north of the severely disadvantaged community of Lamont. More specifically, the intertie connection is where the FFP crosses beneath the East Side Canal 0.25 mile west of State Route 184 and 0.25 mile south of Muller Road at FFP Manhole #2 (MH#2) (Latitude: 35.321144°, Longitude: -118.919310°). Google Map link

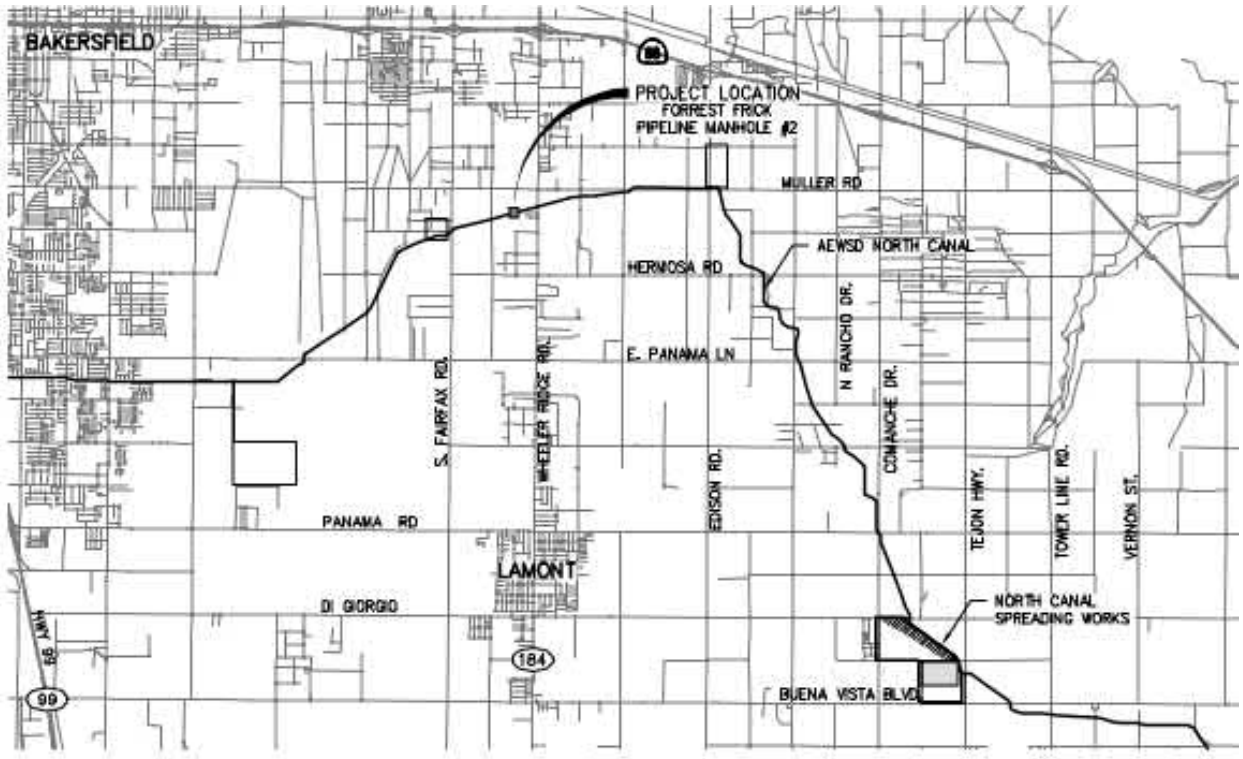


Figure 1 - Project Vicinity Map

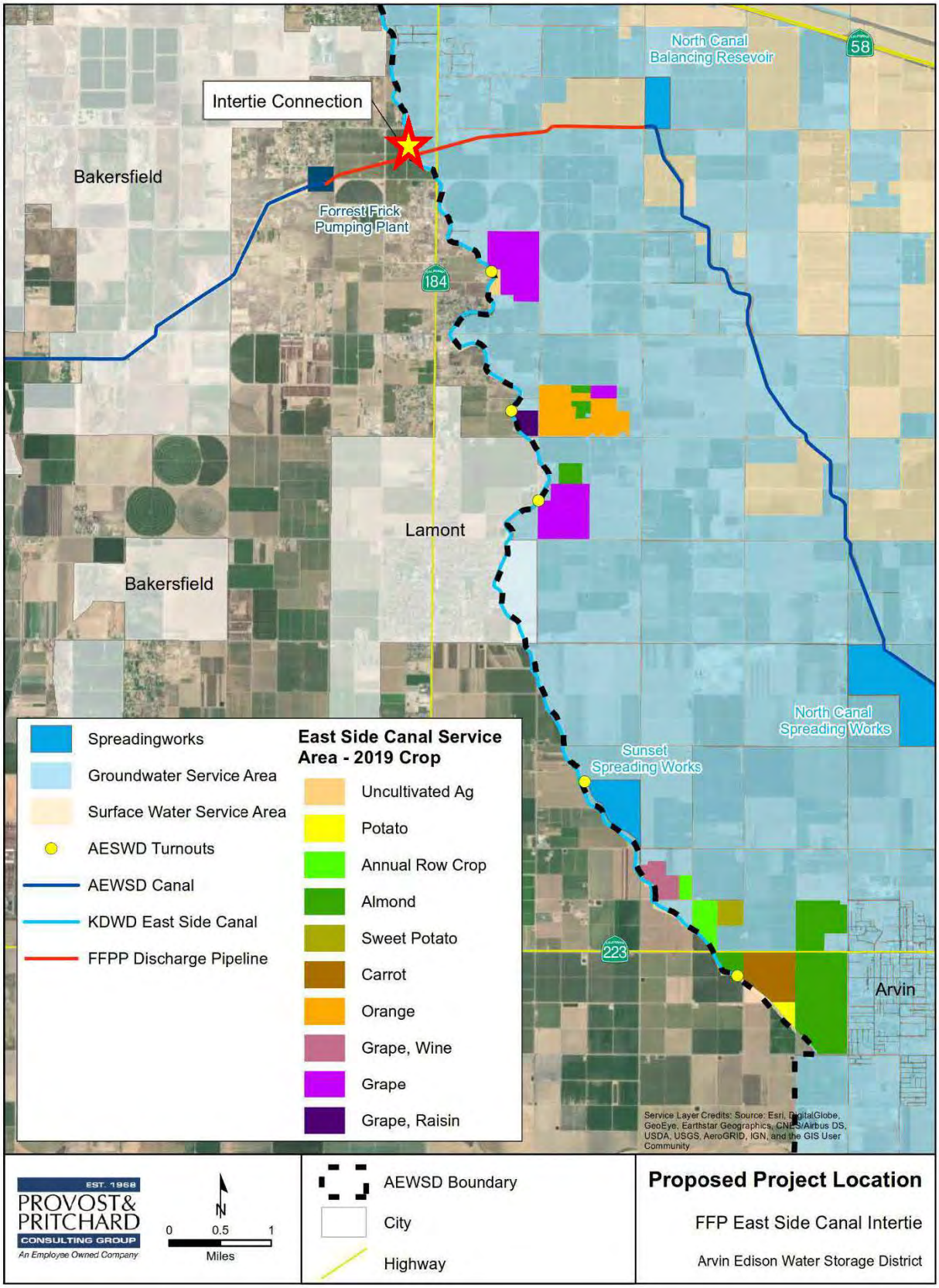


Figure 2 - Project Location and Benefitted Lands of AEWSD Groundwater Service Area

Technical Project Description

The Project will construct an intertie pipeline between the existing FFP and the East Side Canal. For background, the FFP, a 1,000 cubic feet per second (cfs) pipeline, is pressurized by the AEWSD Forrest Frick Pumping Plant and connects AEWSD's Intake Canal to its North Canal. The FFP is a critical piece of infrastructure for AEWSD because it operates approximately 50 weeks per year conveying AEWSD's USBR Class 1 and Class 2 water and other supplies. The existing 30-inch access MH#2 is shown in the record drawing detail below. AEWSD staff recently recorded +/- 44 pounds per square inch (psi) on the MH#2 pressure gauge when the FFP was conveying 300 cfs. The FFP pressure provides the necessary design criteria for proposed intertie pipeline flow rate. The KDWD East Side Canal traverses north to south and serves as the boundary between in AEWSD and KDWD in locations. The East Side Canal headgate at the Kern River has a design capacity of 85 cfs. The canal typically conveys irrigation deliveries March 15 through August 15, but occasionally conveys water year-round from various sources including Pre-1914 Kern River entitlement, transfers/exchanges, well water, and City/County stormwater.

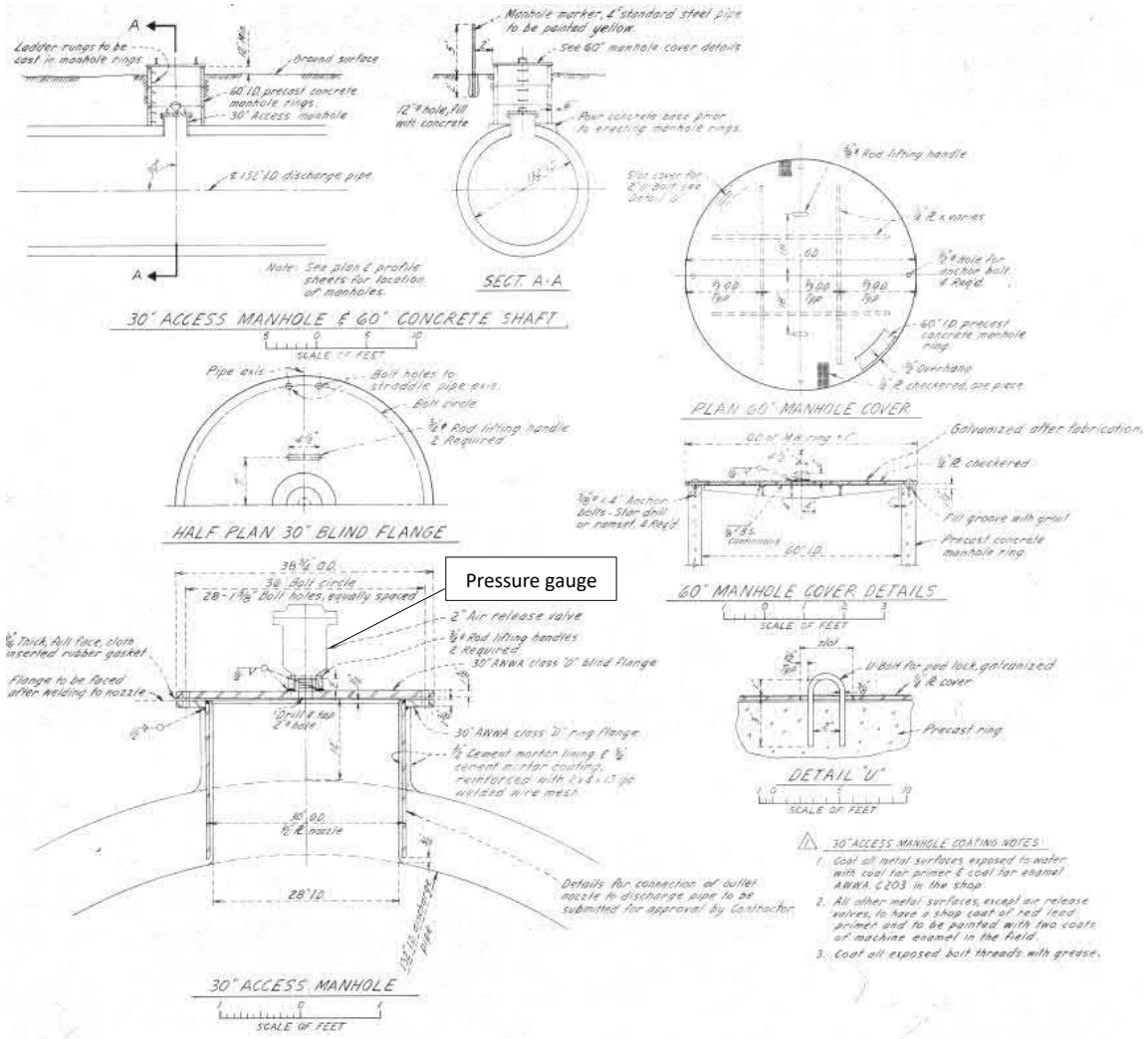


Figure 3 - Forrest Frick Pipeline As-built Drawings of Access Manholes

The proposed intertie pipeline between the existing FFP and East Side Canal will commence at FFP MH#2, pass through various new valves, fittings, a flow meter, and terminate into a canal outlet structure in the west bank of the East Side Canal. Preliminary design drawings on the next page show the plan and profile views of the proposed intertie. The MH#2 connection includes an 84-inch diameter concrete enclosure with access ladder and grating, pressure gauge, 30-inch isolation valve, and 30-inch steel pipe 90-degree elbow. The horizontal pipeline segment includes air and vacuum relief valves, 30-inch flow regulating control valve, 30-inch steel pipe increaser to 36-inch, 36-inch steel pipe, 36-inch magnetic flow meter inside a 84-inch diameter concrete enclosure with access ladder and grating, 36-inch steel pipe increaser to 42-inch, 42-inch steel tee fitting, 42-inch steel pipe 90-degree elbow, and two 42-inch steel pipes. Steel protection posts will be placed alongside the pipeline to protect maintenance vehicles from driving over shallower portions of the pipeline. The cast-in-place reinforced concrete canal outlet structure includes an access ladder, grating, and long-crested weir which will convey water into the East Side Canal onto proposed reinforced concrete canal lining bordered by rock rip rap underlaid with geotextile fabric for erosion control.

Given the ample pipeline pressure recorded in the FFP MH#2 pressure gauge, the proposed pipeline appurtenances, the design necessities to control flow rate, internal pipeline pressures, and mitigate air entrapment and turbulent flow. The design flow rate of 40 cfs was established to limit high pipeline velocities which could lead to shorter infrastructure life spans and other potential operational deficiencies. The proposed intertie will be monitored by a Supervisory Control and Data Acquisition (SCADA) system which will allow AEWSD staff to manually operate the 30-inch flow regulating valve according to the 36-inch magnetic flow meter output. The design requires the initial 30-inch connection be increased to 36-inch and split into two 42-inch steel pipes to decrease the pipeline velocity before entering the canal outlet structure and flowing over the long-crested weir. The project was designed to have a maximum velocity of approximately 2 feet per second (fps) over the weir to closely match the typical velocity of the East Side Canal flow.

The operation of the proposed intertie pipeline with SCADA-ready flow regulating valve could be throttled, capable of delivering a range of flow between 10 cfs and 40 cfs. Lower flow rates are technically feasible, but slower velocities are less accurately measured through the flow meter. All diverted water will be measured to +/-0.5% accuracy and recorded by the magnetic flow meter totalizer. The actuated valve, flow meter, water level sensors, and SCADA system will be powered by a new PG&E electrical service under Power and Water Resources Pooling Authority (PWRPA). Proximate PG&E service is available. Project electrical components include a service pole, meter, conduit, wires, panel backboard, control panel, cables, raceways, data logger, radio, antenna, grounding system, and other miscellaneous electrical components. Project electronics will be programmed and integrated into AEWSD's existing SCADA system for remote monitoring, alarms, and notifications. The Project will be owned, operated, and maintained by AEWSD.

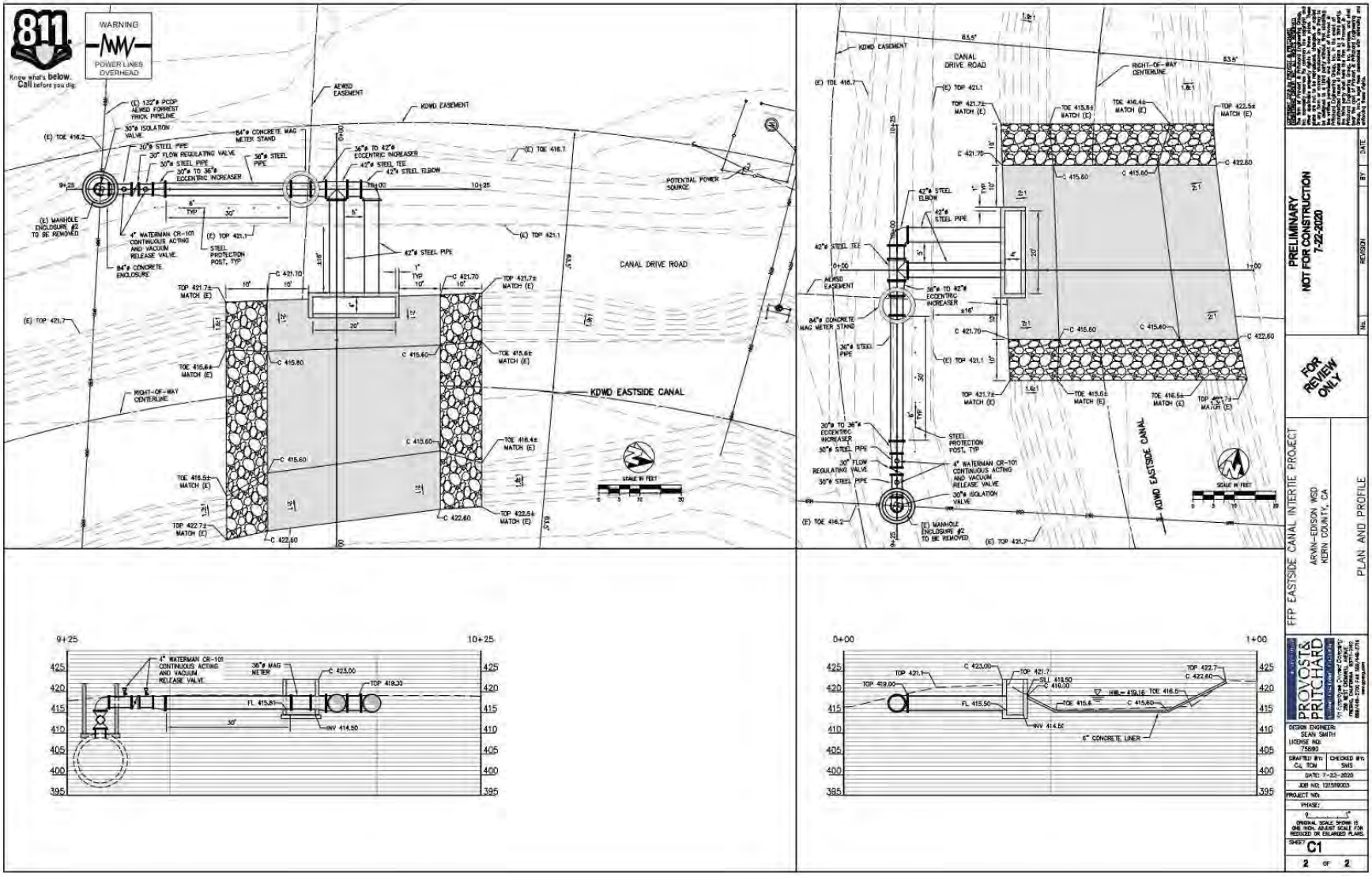


Figure 4 - Preliminary FFP East Side Canal Intertie Project Design Drawings

Performance Measures

The performance measure to quantify the Project benefit is the total volume of water passing through the proposed intertie pipeline. The total volume of water in acre-feet (AF) will be measured to +/-0.5% accuracy and recorded by the magnetic flow meter totalizer. District operators will use their standard procedures for maintaining written records when the Project is operated and summarize deliveries monthly.

Evaluation Criteria

Evaluation Criterion A—Project Benefits (40 points)

- *How will the project build long-term resilience to drought? How many years will the project continue to provide benefits?*

The Project would allow water supplies to be wheeled into the KDWD East Side Canal to serve: 1) temporary surface water contracts to AEWSD growers, 2) AEWSD Sunset Spreading Works groundwater recharge facility, 3) to KDWD growers, and 4) to KDWD recharge facilities.

The Project will build long-term resilience to the drought by providing AEWSD increased delivery flexibility, transfer/exchange potential between AEWSD and KDWD, could assist/alleviate canal conveyance limitations/prorates, as well as improved operational efficiency, improved water quality, and flood management. This Project will continue to provide benefits for the service life of the intertie infrastructure, minimum 50 years, and most likely decades more with proper maintenance and repairs to keep the infrastructure operating as designed.

- *Will the project make additional water supplies available?*

The Project will make additional water supplies available by providing an intertie connection between the AEWSD and KDWD systems. This connection would allow for delivery flexibility and transfer/exchange potential between AEWSD and KDWD. Contracted surface water supplies would be delivered to areas which are currently reliant on groundwater supplies to meet their agricultural and drinking water demands. AEWSD's very large Class 2 Contract supply, up to 311,675 AF, is not fully utilized as shown in **Figure 5** on page 7. In wet years, this results in spills to the San Joaquin River and ultimately floodwaters downstream.

  - *If so, what is the estimated quantity of additional supply the project will provide and how was this estimate calculated? Provide this quantity in acre-feet per year as the average annual benefit over ten years (e.g., if the project captures flood flows in wet years, provide the average benefit over ten years including dry years).*

The conveyance of floodwater will be used for calculation purposes. However, once the Project is constructed, other water transfers/exchanges are anticipated which would only increase the average annual benefit. The Project would have access to Friant Central Valley Project (CVP) and Kern River floodwater, which historically has been available for approximately 60 days every 2.5 years. The Project design will convey 40 cfs for 60 days yielding approximately 4,760 AF/yr when surplus water is available. Since floodwater occurs on average every 2.5 years, the average annual

benefit is approximately 1,900 AF/year. The average annual benefit over ten years is 19,000 AF and over the minimum infrastructure service life of 50 years is **95,000 AF of new water supply**.

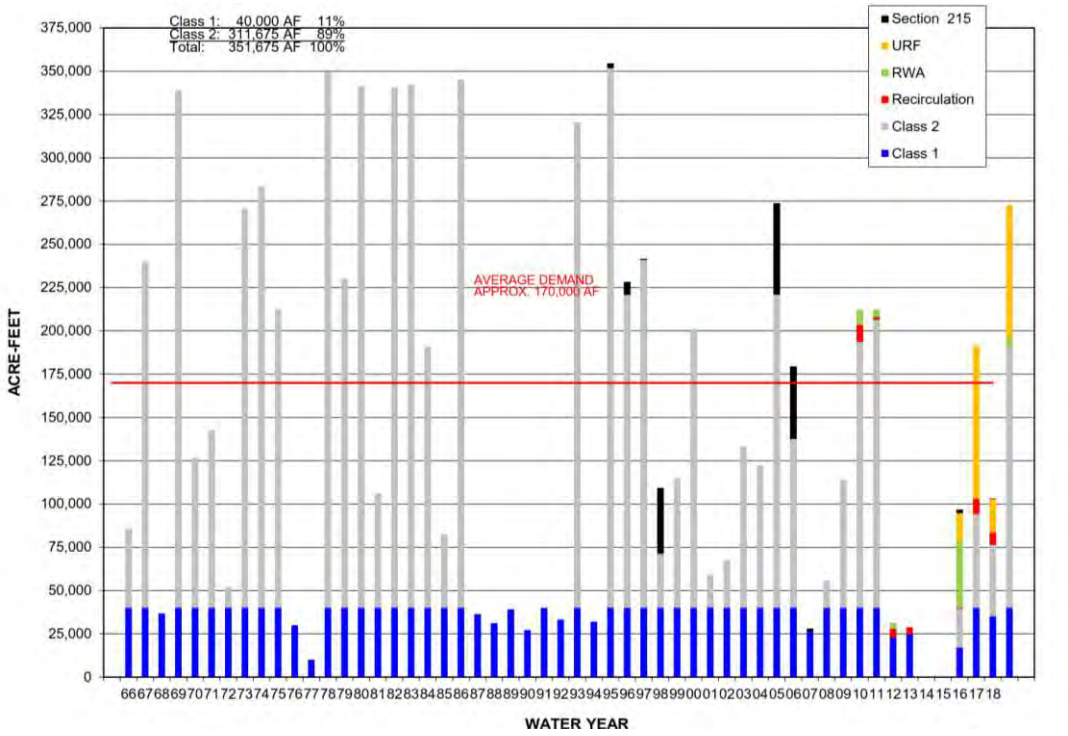


Figure 5 - AEWSD History of Friant-Kern Allocation

For additional supply from water purchases/transfers/exchanges, the maximum additional supply is based on the benefited crop acreage. The table below shows the acreage by crop that would benefit from this Project. The evapotranspiration (ET) demand of the crops was estimated using the Cal Poly Irrigation Training & Resource Center (ITRC) ETc tables averaged for zone 14 and 15. The water supply provided from this project would be used on the crops for irrigation in-lieu of pumping groundwater supplies.

Table 1 - Crop Acreage Benefit from Project

CROP	ACRES	ET (IN/YEAR)	ET (FT/YEAR)	CROP DEMAND (AF/YR)
Almond	512.45	45.32	3.78	1,935
Carrot	126.51	29.04	2.42	306
Grape	354.53	32.06	2.67	947
Grape, Raisin	30.75	32.06	2.67	82
Grape, Wine-Org	58.52	32.06	2.67	156
Annual Row Crop	78.09	43.69	3.64	284
Orange	187.16	42.50	3.54	663
Potato	17.29	39.96	3.33	58
Sweet Potato	75.94	39.96	3.33	253
Uncultivated Ag	12.36	0	0	0
TOTAL	**1453.60**			**4,685**

- *What percentage of the total water supply does the additional water supply represent? How was this estimate calculated?*

AEWSD delivers an average of 141,000 AF of water per year (not including losses) to customers in its surface water service area (SWSA). An additional average annual benefit of at least 1,900 AF will amount to 1.35% of the District's total average annual surface water supply. From 2003-2012 the District imported an average of 161,388 acre-feet/year (AF/yr) and extracted an average of 59,381 AF/yr from its groundwater wells, for a total average supply of 220,769 AF/yr. An additional average annual benefit of at least 1,900 AF will amount to 0.86% of the District's total average water supply.

The District has a contract with the Bureau of Reclamation (USBR) (who holds appropriative water rights on the San Joaquin River) to supply water from the Friant Division of the Federal CVP through the Friant-Kern Canal. AEWSD's Friant water supply contract provides for the annual delivery of 40,000 AF of Class 1 (firm) water and up to 311,675 AF of Class 2 (non-firm) water. This contract began in 1966, with subsequent renewals, and was converted to a permanent (9d) water supply contract in 2011 pursuant to conditions of the San Joaquin River Restoration Settlement. The CVP supplies are utilized directly by the District and to effect direct delivery, water transfers and/or exchanges.

The District participates in numerous water transfers and exchanges. In a typical year AEWSD will participate in water transfers and exchanges with 15 to 20 other agencies in various locations throughout the State. The District's strategic geographic location, its interconnections to major Federal, State, and local water conveyance facilities, and its versatile facilities gives it a unique ability to implement these transfers and exchanges.

Historically the District has also purchased other supplies for groundwater recharge when it is available and recharge capacity is available in the District. Typically, such water is available in relatively "wet" years, in which Friant Class 2 water is also allocated to the District. These historical purchases have included its own contracted supplies and both Friant Section 215 water (San Joaquin River water released for flood protection), and floodwater from the Kern River, Kaweah River, Tule River and Kings River System. Floodwaters originating in the Sacramento Valley and available in the California Aqueduct (CVP Section 215 and State Water Project (SWP) Article 21 Water) have also been banked by AEWSD and Metropolitan Water District. These flood waters otherwise would flood lands in the Central Valley and/or would be lost (for example to the ocean) for beneficial uses.

Future irrigation water demands in AEWSD are expected to remain similar to current demands for the foreseeable future subject to California Sustainable Groundwater Management Act (SGMA) Groundwater Sustainability Plan (GSP) requirements. However, the advent of the permanent water supply contract, which does not carry Federal excess-lands water charges, has increased opportunities for the District to provide surface water to more lands in the groundwater service area (GWSA) when it is available in excess of the normal demands of the SWSA. The District calls this practice "Temporary Water Service Contracts", as the customers do not have regular water supply contracts with the District. Since that practice results in GWSA growers turning off groundwater wells they would otherwise use to supply their crops, groundwater is recharged "in-lieu" by such delivery of Temporary Water.

- *Provide a brief qualitative description of the degree/significance of the benefits associated with the additional water supplies.*

The Project benefits can be quantified, as described above, but the qualitative significance of Project benefits is best demonstrated by the included Letters of Support from City of Arvin, KDWD, and Kern Integrated Regional Water Management Plan (IRWMP) Executive Committee. Rural severely disadvantaged communities (SDACs), such as Arvin and Lamont who rely solely on groundwater for drinking water supplies, look to the neighboring irrigation and water districts to build the critical surface water infrastructure that recharges the groundwater aquifer and provides long-term assurance and drought resiliency for their constituents.

- *Will the project improve the management of water supplies? For example, will the project increase efficiency, increase operational flexibility, or facilitate water marketing (e.g., improve the ability to deliver water during drought or access other sources of supply)?*

The Project will include increased operational flexibility, improved operational efficiency, and facilitate water transfers/exchanges between AEWSD and KDWD.

- *If so, how will the project increase efficiency or operational flexibility?*

The Project will increase operational flexibility by connecting the KDWD system to the AEWSD system. AEWSD and KDWD both reside in the same groundwater subbasin and have a history of constructing facility interties to increase efficiency and operational flexibility. However, currently there is no connection between the AEWSD and the KDWD East Side Canal. The AEWSD Intake Canal is the head of the system that ultimately delivers water to the Forrest Frick Pumping Plant and the FFP. The Intake Canal diverts water from the Kern River where there are multiple other canals in proximity, serving as major water infrastructure crossroads. One of the canals is the Friant Kern Canal which terminates and discharges water into the Kern River. The KDWD East Side Canal diverts water from the Kern River upstream of this location. This Project would connect the two systems and allow more sources of water to be utilized from the East Side Canal. KDWD has multiple wells along the AEWSD Intake Canal. This Project would allow the well water to be utilized in the East Side Canal. Currently, KDWD cannot directly convey well water into the East Side Canal. This Project also allows AEWSD to convey water down the East Side Canal for AEWSD growers in the groundwater service area, some of which already have existing turnouts from the East Side Canal as shown on the Project Location map, to utilize on fields within the District. This would provide the landowners access to surface water in areas that are entirely dependent on groundwater. This Project benefits both AEWSD, KDWD, SDACs, and other stakeholders who have exchange/water transfer potential.

- *Will the project make new information available to water managers? If so, what is that information and how will it improve water management?*

The Project will implement SCADA to monitor flow in the proposed intertie as well as water levels in the East Side Canal. The SCADA system allows for the remote collection of water management data to be continuously transferred, trended, and recorded for historical analysis and real-time decision making of water managers.

- *Will the project have benefits to fish, wildlife, or the environment? If so, please describe those benefits.*

The Project will improve the environment because portions of the new water supply will be diverted to the AEWSD Sunset Spreading Work groundwater recharge facility. Groundwater recharge is an environmental necessity for those relying on groundwater such as SDACs and other beneficial users.

Evaluation Criterion B—Drought Planning and Preparedness (15 points)

For purposes of evaluating this criterion, please:

- *Attach a copy of the applicable drought plan, or sections of the plan, as an appendix to your application. These pages will not be included in the total page count for the application.*

The applicable drought plans for this Project are the GSP for Kern Groundwater Authority, as well as the AEWSD Drought Management Plan (DMP). Relevant sections of the GSP and the entire DMP are attached in **Appendix C**. The link for the full GSP is https://sgma.water.ca.gov/portal/gsp/preview/36 (scroll down to Plan Contents: Groundwater Sustainability Plan). This Project was also identified in the Kern IRWMP and AEWSD Water Management Plan.

- *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.*

SGMA requires the basin be sustainable by 2040. The development of the GSP included establishing sustainable management criteria for the basin to become sustainable including the projects to help make it so. The DMP gives the district's specific plans for handling drought situations including sample letters to landowner/water users during the drought of 2014 and 2015.

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

The GSP was developed with stakeholder input through public meetings and a public comment period on the draft document. GSP Section 2.1.5 Notice and Communication explains that the "process included communication and outreach at the local level, with each Kern Groundwater Authority (KGA) member agency engaging with its beneficial users to gather vital input, data, and feedback to ensure the success of this GSP and individual management area plans." For a full explanation, see GSP Attachment E: Communication and Engagement Plan. Some key components are the interested parties list to receive communications, the stakeholder survey, and the agricultural survey, (both available in English/Spanish) which were available at workshops, stakeholder meetings, and accessible on the KGA website (to complete online).

  - *Does the drought plan include consideration of climate change impacts to water resources or drought?*

The GSP takes into consideration climate change when developing the sustainable management criteria. Section 9.4 in the Arvin-Edison Management Area Plan (Attachment I.#1 in the GSP) states that "in order to estimate the potential effects on the projected water budget of climate change towards the end of the planning and implementation horizon . . ., a water budget scenario based on 2070 'central tendency' climate change factors published by DWR was developed." (See Section 9 of the GSP for AE projected water budget, and use this link to DWR's climate change document.)

- *Describe how your proposed drought resiliency project is supported by an existing drought plan.*

The Project increases access to surface water during wet years to help offset the groundwater pumping in the area, specifically to areas that do not currently have access.

  - *Does the drought plan identify the proposed project as a potential mitigation or response action?*

The regulations for the GSP state that the plan shall include a description of the projects and management actions the GSA has determined will achieve the sustainability goal for the basin. The KGA GSA provides a summary list of all projects and management actions being considered for implementation by each member agency including the project title, implementation status, a brief description of the project, and benefits associated with the project. AEWSD is a member agency for the KGA GSA and included this Project in the list of projects in the GSP. This Project is listed as the Forrest Frick Pipeline/KDWD East Side Canal Intertie in the GSP summary table, Table 4-1 (**Appendix C**). AEWSD has prioritized this Project from within their list of projects and has 30% design complete, as well as funding within their current accounts to complete the Project if grant funding is received.

  - *Does the proposed project implement a goal or need identified in the drought plan?*

Yes, the Project is aligned with the needs outlined in DMP, relevant to water banking and water regulation, monitoring hydraulic levels or conditions, and alternate water supplies.

  - *Describe how the proposed project is prioritized in the referenced drought plan?*

Specific projects were not prioritized in the DMP, but this Project was prioritized in the GSP because it was a multi-benefit project with credible project yield.

Evaluation Criterion C—Severity of Actual or Potential Drought Impacts to be addressed by the Project (15 points)

Describe the severity of the impacts that will be addressed by the project:

- *What are the ongoing or potential drought impacts to specific sectors in the project area if no action is taken (e.g., impacts to agriculture, environment, hydropower, recreation and tourism, forestry), and how severe are those impacts? Impacts should be quantified and documented to the extent possible. For example, impacts could include, but are not limited to:*

- *Whether there are public health concerns or social concerns associated with current or potential drought conditions (e.g., water quality concerns including past or potential violations of drinking water standards, increased risk of wildfire, or past or potential shortages of drinking water supplies? Does the community have another water source available to them if their water service is interrupted?).*

Potential drought impacts to the surrounding SDACs who are reliant on groundwater for drinking water supplies would be minimized by the Project which would serve groundwater recharge facilities and in-lieu groundwater pumping to stabilize local groundwater aquifers.

- *Whether there are ongoing or potential environmental impacts (e.g., impacts to endangered, threatened or candidate species or habitat).*

Ongoing or potential environmental impacts of drought to species or habitat are unknown.

- *Whether there are ongoing, past, or potential, local, or economic losses associated with current drought conditions (e.g., business, agriculture, reduced real estate values).*

Past drought impacts to groundwater users have resulted in a decline of groundwater levels and an increase in groundwater pumping costs. The GSP has maps showing the historical and recent AEWSD *Groundwater Elevation Hydrographs (Figures GWC-5 and GWC-6).* The GWSA of AEWSD experiences the greatest decline because surface water supplies are not available to offset groundwater pumping and/or recharge the primary aquifer. During the peak drought 2014-2016, a decline in elevation of 50 feet or more can be seen in several well hydrographs. The cost increase of declining water levels during peak drought can be calculated as follows (Refer to Appendix F, *An Analysis of the Energy Intensity of Water in California* white paper and *PG&E AG-5 B* rate for value sources): (50 feet) x (1.46 kWH/acre-foot/foot of lift) x ($0.24/kWh) = $17.52 /AF increase Unless there are significant wet years following a drought or other GSP projects and managements to reverse the decline, the $17.52 /AF continues to increase further reducing profit margins and increasing economic losses.

According to the AEWSD GSP Table 3-1, future water levels may drop 50 feet from the measurable objectives to the minimum thresholds during normal/wet years. These future targets will only be achieved by increasing water supply through projects like this intertie Project or reducing water demand. For some groundwater users, this may mean wells going dry and/or loss of crop production. There is an economic loss associated with having to fallow crops and the cost depends on the crop type. The top 4 crop types within Kern County include grapes, almond, pistachios, and citrus. From the 2018 Kern County Ag Commissioner Report in Appendix F, the cost per acre to fallow land is summarized in the table below. This table does not include the cost of the land. Given that these top 4 crop types are permanent crops, the loss of crop $/acre would then be multiplied by 3-5 years depending on crop type/varietal because new permanent crops take many years to bear fruit and reach maturity. Assuming the 1 year of fallowing plus a conservative 3 years to maturity, the extended loss $/acre is shown below:

Table 2 - Extended Loss $/Acre

CROP	VALUE	ACRES	$/ACRE	$/ACRE OVER 4 YRS
Grapes	$1,512,473,000	109,400	$13,825	$55,300
Almond	1,235,158,000	223,000	$5,539	$22,156
Pistachios	1,143,972,000	128,000	$8,937	$35,748
Citrus	1,063,063,000	66,720	$15,933	$63,732

From another perspective, this Project would yield approximately an average annual 1,900 AF which would serve the average annual demand of approximately 711 acres of grapes, 503 acres of almonds, 567 acres of pistachios, or 537 acres of citrus based on the ET demand of the crops (from Cal Poly ITRC ET tables averaged for zones 14 and 15). The table below summarizes the value of what could be saved the loss of revenue for the acreage lost.

Table 3 - Crop Savings Value

CROP	ET (AF/ACRE)	ACRES LOST	$/ACRE	VALUE OF CROP LOST
Grapes	2.67	711	$13,825	$9,831,995
Almond	3.78	503	$5,539	$2,786,830
Pistachios	3.35	567	$8,937	$5,063,867
Citrus	3.54	537	$15,933	$8,548,698

- *Whether there are other drought-related impacts not identified above (e.g., tensions over water that could result in a water-related crisis or conflict).*

As we all know, water is a precious commodity and new water-related conflicts arise every year. Future drought-related impacts are sure to happen despite having an adopted GSP. The 20-year horizon of GSP implementation seems distant but will elapse quickly with many challenges. AEWSD can only prepare itself by investing in the future and building drought resiliency with projects such as this intertie Project to thwart future crisis, conflict, hardship, and economic loss.

- *Describe existing or potential drought conditions in the project area.*
  - *Is the project in an area that is currently suffering from drought or which has recently suffered from drought? Please describe existing or recent drought conditions, including when and the period of time that the area has experienced drought conditions*

Though the Project area is not currently in a drought, the United States Drought Monitor (https://droughtmonitor.unl.edu/Data/Timeseries.aspx), there have been three long term droughts since the year 2000. The most recent drought was from 2012-2018 with a severe drought from 2014-2016. Below is a graph of the percent of Kern County in a drought since 2000.

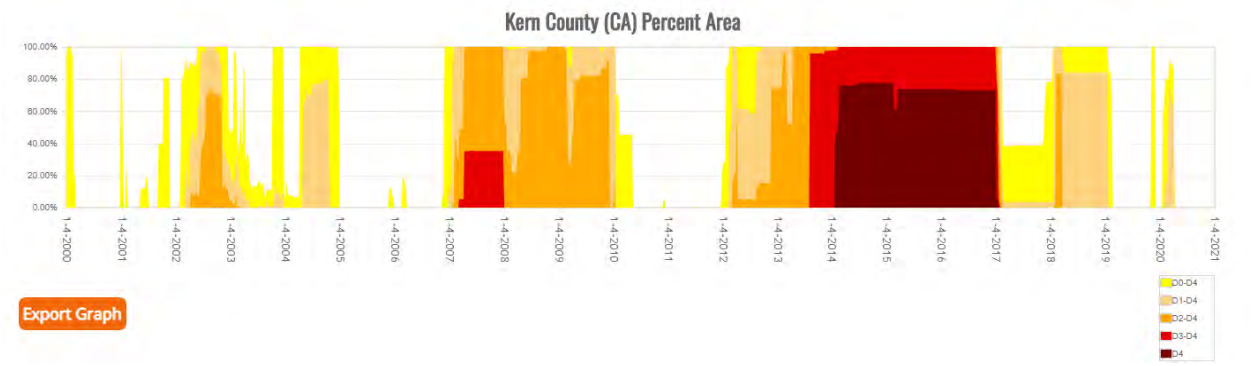


Figure 6 - Percentage of Drought in Kern County since 2000

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

The following discussion is from the KGA GSP Section 9.4.5:
Per the GSP Regulations, climate change impacts were taken into consideration for the District's future water budget estimates. In summary, climate change decreases precipitation, changes snowmelt timing (earlier), and increases evapotranspiration (warmer temperatures). Climate change is also expected to impact the reliability of surface water deliveries in the future. Climate change factors were provided by DWR and impact several different water budget components: precipitation, evapotranspiration, surface water imports, natural surface water inflows, net inflow, exports and deliveries, groundwater outflows, etc. There were two future water budgets estimates for climate change:

- 2030 Climate Change Scenario – uses 2030 climate change factors developed by DWR and the Friant Water Authority to estimate future water supplies, changes to precipitation and evapotranspiration
- 2070 Climate Change Scenario – uses 2070 climate change factors developed by DWR and the Friant Water Authority to estimate future water supplies, changes to precipitation and evapotranspiration

It is only under the projected 2030 (and 2070) Climate Change Scenarios that a net water supply deficit is projected to occur. That projected deficit is due, in large part, to a projected reduction in imported water supplies. The volume of CVP supplies is anticipated to decrease under the 2030 Climate Change Scenario relative to the Baseline Scenario, and that decrease is the main cause of the projected deficit.

Under the 2030 Climate Change Scenario, changes in precipitation, natural surface water inflows, and M&I consumptive use relative to the Baseline Scenario are all relatively small (i.e., relative changes of 0.8% to 2.9% and absolute changes of approximately 100 AFY to 600 AFY). The most significant changes relative to the Baseline Scenario is a reduction in surface water imports of approximately -32,000 AFY (-18.6%). Associated surface water exports and deliveries to the White Wolf Subbasin are also reduced on a proportional basis by approximately -4,100 AFY (-10.7%). Evapotranspiration is greater by approximately 6,000 AFY (+2.7%).

Overall, the 2030 Climate Change Scenario indicates a net deficit of approximately -31,600 AFY. Consistent with the approach being used by all KGA GSA members (and other GSAs in the basin), this estimated net deficit under the 2030 Climate Change Scenario is the amount that the Projects and Management Actions are targeted to address by the GSP implementation deadline (i.e., January 2040). If imported surface water supplies are limited only to the CVP source, the projected water budget for the 2030 Climate Change Scenario indicates a net deficit of approximately -46,500 AFY. Conversely, if imported surface water supplies are to include full (climate-adjusted) SWP and Kern River supplies, the projected water budget for the 2030 Climate Change Scenario indicates a net deficit of approximately -17,500 AFY.

Under the 2070 Climate Change Scenario, changes in precipitation, natural surface water inflows, and M&I consumptive use relative to the Baseline Scenario are somewhat greater than in the 2030 Climate Change Scenario, but still not significant (i.e., relative changes of -2.1% to 6.9% and absolute changes of approximately 500 AFY to -1,500 AFY). Surface water imports are lower by approximately -58,400 AFY (-33.9%). Surface water exports and deliveries to the White Wolf Subbasin are also lower by approximately -15,500 AFY (-40.9%). Evapotranspiration is greater by approximately +13,300 AFY (+6.0%).

Overall, the 2070 Climate Change Scenario indicates a net deficit of approximately -56,300 AFY. If imported surface water supplies are limited only to the CVP source (i.e., removing all future SWP and Kern River Imports), the projected water budget for the 2070 Climate Change Scenario indicates a net deficit of approximately -68,800 AFY. Conversely, if imported surface water supplies are to include full (climate adjusted) SWP and Kern River supplies, the projected water budget for the 2070 Climate Change Scenario indicates a net deficit of approximately -44,000 AFY.

It should be noted that the results from the numerical model show that, upon implementation of the planned Projects and Management Actions, the Arvin-Edison Management Area is projected to achieve its sustainability goal (i.e., avoids Minimum Thresholds and Undesirable Results and achieve Measurable Objectives for Chronic Lowering of Groundwater Levels) (see Section 17.8.2 Evaluation Relative to Water Level Sustainability Criteria).

Evaluation Criterion D—Project Implementation (10 points)

- *Describe the implementation plan of 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. Milestones may include, but are not limited to, the following: design, environmental and cultural resources compliance, permitting, construction/installation.*

See next page for Project schedule. The California Environmental Quality Act (CEQA) Notice of Exemption (NOE) was completed in March 2020 and 30% Design was completed in May 2020. Project planning and 60% design will continue through 2020. Final design will be completed in March 2021 with NEPA/cultural compliance following in summer of 2021. The estimated 4-month construction duration would commence in October 2021 and be completed in January 2022.

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

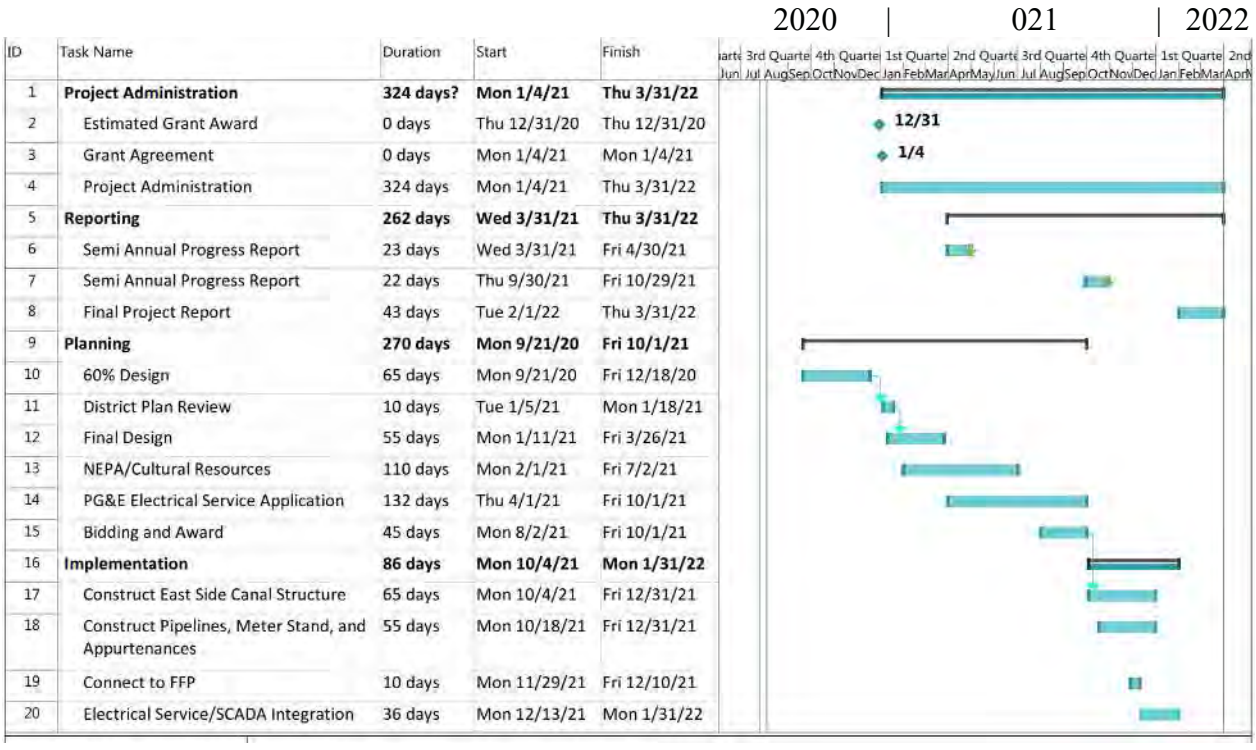
AEWSD and KDWD will work cooperatively during the design process to incorporate and approve all design plans and specifications. In addition to the NEPA/cultural resources compliance, a PWRPA/PG&E electrical service application will be submitted prior to construction to provide Project power.

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

The Project 30% design has been completed and included topographic and boundary surveys, preliminary design of structures, pipelines, pipeline appurtenances, hydraulic calculations, and engineer's estimate of probable construction cost. These costs predated July 2020 and are not included in the grant budget.

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

As part of the scope of work and 100% design, AEWSD and KDWD will enter into an operations and maintenance agreement for this Project.



ID	Task Name	Duration	Start	Finish
1	**Project Administration**	**324 days?**	**Mon 1/4/21**	**Thu 3/31/22**
2	Estimated Grant Award	0 days	Thu 12/31/20	Thu 12/31/20
3	Grant Agreement	0 days	Mon 1/4/21	Mon 1/4/21
4	Project Administration	324 days	Mon 1/4/21	Thu 3/31/22
5	**Reporting**	**262 days**	**Wed 3/31/21**	**Thu 3/31/22**
6	Semi Annual Progress Report	23 days	Wed 3/31/21	Fri 4/30/21
7	Semi Annual Progress Report	22 days	Thu 9/30/21	Fri 10/29/21
8	Final Project Report	43 days	Tue 2/1/22	Thu 3/31/22
9	**Planning**	**270 days**	**Mon 9/21/20**	**Fri 10/1/21**
10	60% Design	65 days	Mon 9/21/20	Fri 12/18/20
11	District Plan Review	10 days	Tue 1/5/21	Mon 1/18/21
12	Final Design	55 days	Mon 1/11/21	Fri 3/26/21
13	NEPA/Cultural Resources	110 days	Mon 2/1/21	Fri 7/2/21
14	PG&E Electrical Service Application	132 days	Thu 4/1/21	Fri 10/1/21
15	Bidding and Award	45 days	Mon 8/2/21	Fri 10/1/21
16	**Implementation**	**86 days**	**Mon 10/4/21**	**Mon 1/31/22**
17	Construct East Side Canal Structure	65 days	Mon 10/4/21	Fri 12/31/21
18	Construct Pipelines, Meter Stand, and Appurtenances	55 days	Mon 10/18/21	Fri 12/31/21
19	Connect to FFP	10 days	Mon 11/29/21	Fri 12/10/21
20	Electrical Service/SCADA Integration	36 days	Mon 12/13/21	Mon 1/31/22

Figure 7 - Project Schedule

Evaluation Criterion E—Nexus to Reclamation (10 points)

- *How is the proposed project connected to a Reclamation project or activity?*

In the past, AEWSD has worked with the USBR as follows:

1. AEWSD has operated as Contractor of Project Water from the Friant Division of the CVP with the USBR per the following contracts:
    - Contract No. 14-06-200-229A from August 30, 1992, to February 28, 1995.
    - Interim renewal contracts identified as Contracts No (s). 14-06-200-229A-IR1, IR2, IR3 and IR4 which provide for continued water service from December 1, 2000, through February 28, 2001.
    - Long-Term Renewal Contract between the United States and Arvin-Edison Water Storage District, Contract No. 14-06-200-229A-LTR1 of January 20, 2001, effective March 1, 2001, through November 2011.
    - Perpetual 9d Contract.
2. AEWSD was granted a Federal Loan in 1966. This $45 million loan, supported by the AEWSD Engineering Report in Support of Application for Federal Loan under Public Law 130 for Construction of an Irrigation Distribution System, has been fully repaid.

Note that items 1 and 2 were supported by USBR Factual Reports and Supplements dated from 1954 to 1962.

3. AEWSD has a contract for Federal power (WAPA) which is administered through Power & Water Resources Pooling Authority (PWRPA).

4. AEWSD operates under a Reclamation approved Water Conservation Plan as of December 2013[1]. This plan has been updated annually with significant revisions scheduled every five years including in 2017.

5. AEWSD was granted a Water Conservation Field Services Program (Agreement 07FG200022) by the USBR in the amount of $50,000 (50% cost share) for Modernization/Automation of Canal Operations Utilizing SCADA, to study increased delivery flexibility utilizing a check structure, and installation of Flow Measurement Devices to Assist in Accounting of Water Recharge/Spreading. Work under this grant was successfully completed in 2011. Also, the "Arvin-Edison Water Storage District - North Canal Check Structure Feasibility Study" dated December 2008 was funded under this grant.

6. AEWSD was granted a Water 2025 System Optimization Review (SOR) (Agreement 08FG200111) by the USBR in the amount of $290,000 (50% cost share) to conduct a System Optimization Review (SOR). This SOR was successfully completed in 2011 and identified and described opportunities for the District to improve water management for its landowners, customers, and water management program partners.

[1] *Arvin-Edison Water Storage District. Water Management Plan Update (2017 Criteria)*

7. AEWSD was granted the 2014 Water Conservation and Efficiency Grant (Agreement R14AP00127) by the USBR in the amount of $1,000,000 for the Sycamore Check Structure Improvements Project.

8. AEWSD was granted the 2015 Water Conservation and Efficiency Grant (Agreement R15AP00157) by the USBR in the amount of $495,508.40 (50% cost share) for their Pilot Groundwater Well Metering Project.

- *Will the project benefit any tribe(s)?*

The Project will not directly benefit any tribe.

- *Does the applicant receive Reclamation project water?*

AEWSD's Friant water supply contract provides for the annual delivery of 40,000 AF of Class 1 (firm) water and up to 311,675 AF of Class 2 (non-firm) water. This contract began in 1966, with subsequent renewals, and was converted to a permanent (9d) water supply contract in 2011 pursuant to conditions of the San Joaquin River Restoration Settlement. The CVP supplies are utilized directly by the District and to effect direct delivery, water transfers and/or exchanges.

- *Is the project on Reclamation project lands or involving Reclamation facilities?*

No.

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

Yes.

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

Yes.

Evaluation Criterion F—Department of the Interior and Bureau of Reclamation Priorities (10 points)

Department of the Interior Priorities

1. ***Creating a conservation stewardship legacy second only to Teddy Roosevelt***

a. Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment.

The Project incorporates science and technology in the SCADA-ready flow regulating valve and highly accurate magnetic flow meter.

c. Revise and streamline the environmental and regulatory review process while maintaining environmental standards.

The CEQA NOE was completed March 2020. NEPA documentation will be performed by USBR staff and is anticipated to be a Categorical Exclusion.

d. Review the Department's water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity.

AEWSD identified this intertie Project because it would serve as a valuable addition to its distribution system and expand service to groundwater dependent portions of AEWSD.

3. ***Restoring trust with local communities***

a. Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands.

This intertie Project demonstrates neighboring Districts working together to better manage water resources and provide benefits to growers, SDACs, and other beneficial users of groundwater.

5. ***Modernizing our infrastructure***

c. Prioritize Department infrastructure needs to highlight:
(1) Construction of infrastructure

The construction of this Project demonstrates AEWSD's progressive approach to invest in the future by building critical infrastructure projects that provide drought resiliency, improved operational efficiency, and increased opportunities for water market exchanges/transfers.

Bureau of Reclamation Priorities

1. ***Increase Water Supplies, Storage, and Reliability under WIIN and other Authorities.***

The Project will increase water supply and reliability by an approximate average annual 1,900 AF to serve groundwater dependent portions of rural Kern County.

2. ***Streamline Regulatory Processes and Remove Unnecessary Burdens to Provide More Water and Power Supply Reliability***

The CEQA NOE was completed March 2020. NEPA documentation will be performed by USBR staff and is anticipated to be a Categorical Exclusion.

3. ***Leverage Science and Technology to Improve Water Supply Reliability to Communities***

The Project incorporates science and technology in the SCADA-ready flow regulating valve and highly accurate magnetic flow meter. The Project will increase water supply and reliability by an approximate average annual 1,900 AF to serve groundwater dependent portions of rural Kern County adjacent to SDACs of Lamont and Arvin.

4. ***Address Ongoing Drought***

Droughts are inevitable, but drought preparation and resiliency can be implemented now by constructing critical infrastructure that delivers surface water to groundwater dependent areas who suffer most during water crises.

6. ***Improve Water Supplies for Tribal and Rural Communities***

The Project will increase water supply and reliability by an approximate average annual 1,900 AF to serve groundwater dependent portions of rural Kern County.

~~~~ END OF TECHNICAL PROPOSAL AND CRITERIA SECTION ~~~~

Project Budget

Arvin Edison Water Storage District believes that this Project is foundational to Drought Planning and Water Supply Operations. Therefore, AEWSD has planned to solely cover the non-Federal cost share of this Project in the 2020 FY budget. There are no sources of Project funding other than the applicant.

The applicant will be contributing the funding necessary to meet cost share requirements at a minimum of 50 percent total Project cost. The source of funds are mainly water sales revenue and land assessments. The funds are available in AEWSD accounts and no time constraints or contingencies exist on the funds. There is no other grant funding and no third-party in-kind costs associated with this Project.

There are Project costs that may be incurred prior to award related to engineering design. According to the Project schedule, 60 percent design will start September 2020 and end December 2020. The cost of completing this portion of the Project is detailed in the Consultant Estimated Staffing Plan and Cost Breakdown in Appendix F. There is a crucial two-week period after Thanksgiving November 2021 for connection to the FFP MH#2. The expenditure to proceed with 60 percent design benefits the Project by ensuring that construction can happen on time.

Budget Proposal

The total Project cost is the sum of all allowable items of costs, including all required cost sharing, that are necessary to complete the Project. **Table 4** provides the total Project cost and **Table 5** shows funding by source. **Table 6** shows a breakdown of the costs by budget category. Indirect costs are not included in this grant budget. All necessary supplies, materials, and equipment will be supplied by the contractor in the construction phase and are included in the Implementation cost. A detailed Engineer's Opinion of Probable Construction Cost (EOPCC) is presented in **Appendix F**.

Table 4 - Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with requested Federal funding	$500,000
Costs to be paid by the applicant	$506,980
Value of third-party contributions	$0
TOTAL PROJECT COST	**$1,006,980**

Table 5 - Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
Arvin Edison Water Storage District	$506,980
Non-Federal Subtotal	$506,980
REQUESTED RECLAMATION FUNDING	$500,000

Table 6 - Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	$/Unit	Quantity		
Salaries and Wages				
Fernando Ceja, District Engineer	$41	190	HRS	$ 7,790
Micah Clark, Engineering Tech	$29	190	HRS	$ 5,510
Laird Meadows, Engineering Tech	$30	190	HRS	$ 5,700
Fringe Benefits				
Fernando Ceja	$16	190	HRS	$ 3,040
Micah Clark	$10	190	HRS	$ 1,900
Laird Meadows	$16	190	HRS	$ 3,040
Contractual/Construction				
USBR NEPA Consultation	$ 20,000	1	EA	$ 20,000
Design Consultant	$ 129,000	1	EA	$ 129,000
Implementation	$ 831,000	1	EA	$ 831,000
TOTAL ESTIMATED PROJECT COSTS				$ 1,006,980

Budget Narrative

The Project manager for AEWSD will be Fernando Ceja, District Engineer. Labor rates and total estimated hours to be spent on the Project are listed above in **Table 6** and the breakdown of estimated time to be spent on tasks outlined in the Project schedule are shown in **Table 7**. Hours allocated for Reporting include approximately 3 hours for review of each semi-annual report and the final Project report to be prepared by the engineering consultant. Hours allocated for Project Administration, Reporting, Planning, and Implementation include billing, coordination with USBR staff, consultants and contractors, meetings, design review, construction oversight, project closeout, and various other grant related tasks.

Table 7 - Estimated District Staff Hours

	Project Administration	Reporting	Planning	Implementation
Fernando Ceja	30	8	76	76
Micah Clark	10	0	90	90
Laird Meadows	10	0	90	90

Fringe Benefits

The hourly rates for Fringe Benefits of AEWSD employees is listed in **Table 6**. Fringe Benefit costs include District contributions toward Social Security & Medicare, pension plan, life and AD&D insurance, long term disability, medical & vision insurance, dental insurance are calculated in accordance with established District policy and approved by the AEWSD Board of Directors.

A complete breakdown of AEWSD employee Fringe Benefit rates is presented in Appendix F.

Travel
Travel will not be included in the requested grant funding.

Equipment
Equipment will not be purchased or used by AEWSD. All equipment that will be used during construction is included under *Contractual/Construction* as Implementation.

Materials and Supplies
Materials and supplies will be furnished and installed as part of the construction contract and are therefore included in under *Contractual/Construction* as Implementation. The EOPCC presented in Appendix F itemizes the contractor's scope of work as furnished and installed costs. Costs for individual line items were estimated from recent bid canvases of similar projects, quotes from manufacturers, and engineer's past experience with projects similar in size and scope, and include inflation based on USBR cost indices. All preliminary quotes received from manufacturers and referenced bid canvasses are shown in Appendix F. EOPCC values shown attempt to capture all Project costs including, but not limited to manufacturer's list price, taxes, shipping, installation, miscellaneous bolt assemblies, custom fittings, and contractor's profit.

Contractual
Work to be accomplished by consultants or contractors includes design engineering, construction management, and construction implementation. A detailed fee estimate for design engineering and construction management services is included as Appendix F. This estimate shows the expected number of hours associated with each task. Procurement of an engineering contract will be done in accordance with AEWSD professional services contracting policy. The procurement method for the construction contract will publicly advertised, bid, and awarded to the lowest responsible, responsive bidder meeting and contract requirements.

Third-Party In-Kind Contributions
There are no third-party contributions for this Project.

Environmental and Regulatory Compliance Costs
AEWSD has already completed state environmental compliance and has included estimated costs for Federal environmental and cultural resources compliance, to be adjusted for the financial assistance agreement.

Other Expenses
No other expenses are included in the Project budget.

Indirect Costs
Indirect costs will not be included in this grant funding request.

Appendix A - Environmental and Cultural Resources Compliance

H.1. 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.*

The Project will have minimal impacts, if any, to the surrounding environment because the work consists of the reconstruction and minor alteration of the FFP and East Side Canal. The proposed intertie will construct approximately 75 feet of pipeline, pipeline appurtenances, and a reinforced concrete outlet structure in the west bank of the East Side Canal. The outlet structure will be approximately 22 feet long and 6 feet wide by 9.5 feet deep and be comprised on approximately 20 cubic yards of reinforced concrete. The East Side Canal will be reinforced with erosion control improvements. The entire Project is within approximately 7,500 square feet area (0.16 acres) and less than 500 cubic yards of earthwork activities (i.e. excavation, backfilling, and compaction) will be 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?*

No. It is very unlikely endangered species or habitat would be affected.

- *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.*

Not aware of any wetlands or other CWA jurisdictional surface waters.

- *When was the water delivery system constructed?*

The FFP was constructed in 1968. The East Side Canal was constructed circa 1898.

- *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.*

Yes. This Project will modify the East Side Canal built circa 1898. The earthen canal banks and drive roads are routinely maintained for annual irrigation deliveries. The Project will modify the canal bank and drive road during the construction of an outlet structure in the west canal bank and erosion control measures (i.e. concrete canal lining and rock rip rap) to protect the canal.

- *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.

Unknown. A CHRIS record search has not been performed.

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

No. Archeological sites are unlikely given the Project area includes existing irrigation facilities.

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

No. The Project will enhance groundwater conditions and benefit the nearby severely disadvantages communities.

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

No. The District has not received any AB52 letters regarding tribal consultation.

- *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. Routine operation and maintenance of the existing canal would not be affected.

Print Form

Notice of Exemption

Appendix E

To: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

County Clerk
County of: Kern
1115 Truxtun Avenue
Bakersfield CA 93301

From: (Public Agency): Arvin-Edison WSD
20401 E. Bear Mountain Blvd.
Arvin, CA 93203
(Address)

Project Title: Arvin-Edison FFP Eastside Canal Intertie

Project Applicant: Arvin-Edison Water Storage District (AEWSD)

Project Location - Specific:
The Project is located approximately 1/4 mile south of Muller Road and 1/4 mile west of Highway 184, approximately 3 miles southwest of Edison.

Project Location - City: n/a Project Location - County: Kern

Description of Nature, Purpose and Beneficiaries of Project:
The proposed project consists of the reconstruction and minor alteration of the Forrest Frick Pipeline (FFP) and Kern Delta Water District Eastside Canal (EC). The proposed intertie, approximately 75 feet in length, will convey up to 40 cubic feet per second from the FFP Access #2 through a metered pipeline to the EC. The proposed pipeline will commence as a 30" diameter, transition to 36" diameter, and then branch into two 42" diameter pipelines to slow discharge velocities before entering the outlet structure located on the west bank of the EC. The proposed EC outlet structure will be approximately 22' long x 6' wide by 9.5' deep and be comprised of approximately 20 cubic yards of reinforced concrete. The EC will be reinforced with erosion control improvements.

Name of Public Agency Approving Project: Arvin-Edison Water Storage District

Name of Person or Agency Carrying Out Project: Jeevan Muhar

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: noted below
- ☐ Statutory Exemptions. State code number:

Reasons why project is exempt:
Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination.

Class 2 consists of replacement or reconstruction of existing structures or facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced.

Lead Agency
Contact Person: Jeevan Muhar Area Code/Telephone/Extension: (661)854-5573

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☒ Yes ☐ No

Signature: Date: 3/10/2020 Title: Engineer-Manager

☒ Signed by Lead Agency ☒ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR:

CEQA
Transmittal Memorandum

Attach one transmittal memorandum to the front of the original CEQA document. Clip copies in back.
1) If notice requires F&W receipt, you must provide a minimum of 3 copies of the document.
2) If notice does not require F&W receipt, you must provide a minimum of 2 copies of the document.

TYPE OR PRINT CLEARLY

LEAD AGENCY_____

PROJECT TITLE_____

_____

PROJECT APPLICANT_____

PHONE NUMBER (____) _____

PROJECT APPLICANT ADDRESS_____

CITY_____ STATE_____ ZIP CODE_____

WORK ORDER #_____ ☐ 30-Day Posting ☐ 35-Day Posting ☐ 45-Day Posting ☐ Other_____

CONTACT PERSON_____ PHONE NUMBER (____)_____

CHECK DOCUMENT BEING FILED:

☐ Notice of Availability……..…..No Fee

☐ Notice of Intent…….……...….No Fee

☐ Notice of Preparation……..No Fee

☐ Notice of Public Hearing…….No Fee

☐ Other _____ ……...……...….No Fee

☐ Environmental Impact Report (EIR)…….....$3343.25
- ☐ Previously paid F&W (**must attach F&W receipt**) F&W Receipt Number#_____
- ☐ DFG No Effect Determination (**F&W letter must be attached**)……...……...No Fee
- ☐ County Administrative Fee……..…$50.00

☐ Mitigated Negative Declaration or Negative Declaration...……...……...$2406.75
- ☐ Previously paid F&W (**must attach F&W receipt**) F&W Receipt Number#_____
- ☐ DFG No Effect Determination (**F&W letter must be attached**)……....…….....No Fee
- ☐ County Administrative Fee…….$50.00

☐ Notice of Exemption…….……...No Fee
- ☐ County Administrative Fee…….….$50.00

TOTAL $_____

*Additional copies to be returned to:_____
*Method of return: ☐ Hold for pick-up/Call #_____ ☐ Interoffice Mail

PAYMENT METHOD: ALL APPLICABLE FEES MUST BE PAID AT THE TIME OF FILING

☐ JV - Trans Code _____ Dept_____ Fund_____ Expense Key_____
☐ Money Order
☐ Check

Appendix B - Required Permits or Approvals

AEWSD and KDWD will work cooperatively during the design process to incorporate and approve all design plans and specifications. The CEQA NOE was completed in March 2020. In addition to the NEPA/cultural resources documentation to be performed by USBR staff, a PWRPA/PG&E electrical service application will be submitted prior to construction to provide Project power.

s

&

New Electric Service

nes

Getting started guide for your home

If your home construction project requires the installation of new electric service, let Pacific Gas and Electric Company (PG&E) help you meet technical requirements and coordinate your service installation. Depending on your city, you may have the option to choose the less costly overhead service wires or more visually pleasing underground service wires. If you choose underground service wires please refer to the Getting Started Guide: New Electric Service, Power from Underground Lines at www.pge.com/GettingStarted. Once you submit your application to PG&E, we will create a schedule to meet your service connection needs.

Follow these steps to get started:

1 Obtain any necessary permits

Before contacting PG&E, you must secure the appropriate permits required by your city or county building and planning department. Be sure to have all approved documentation ready to submit to PG&E, this will help save time as you begin your project.

2 Apply for new or upgraded electric service

Apply for new or upgraded electric service using Customer Connections Online at www.pge.com/CustomerConnections. You will be assigned a dedicated PG&E customer service representative who becomes the point of contact for you or your contractor. PG&E recommends you contact an electrical contractor to help you plan your new service installation.

3 PG&E will contact you within three days

A PG&E representative will contact you within three days. You or your contractor will be asked to supply details of the project including scope, timeline, blueprints and the load requirements for the electrical appliances you plan to install. For more details on how to become prepared for your call with PG&E go to Electric Service Project Checklist at www.pge.com/GettingStarted. Your PG&E representative can answer additional questions and inform you of issues you may not have taken into account, such as potential costs or technical standards. If necessary, a field meeting will be scheduled. PG&E uses the information you supply during a phone or on-site meeting to prepare a project design.

4 PG&E will prepare project design

During the project design phase, we identify your costs, prepare construction drawings, and order critical materials with long lead times. At this time, you may be asked to pay a design deposit, which would be credited toward the final amount you pay for the work.

5 Additional references

You or your contractor may need to refer to the GREENBOOK at www.pge.com/greenbook, which is a reference manual containing helpful information such as technical specifications and drawings. The following sections may be especially useful when preparing for your electric overhead service:

- Electric Service–Overhead
- Electric Metering–General
- Electric Metering–Residential

6 Approve contract and mail with payment

Along with the project design, you will receive a contract for the full amount of the project work. If you would like PG&E to proceed, mail the signed contract along with your payment in the pre-addressed envelope provided to expedite processing and minimize delays.

7 Schedule construction and establish account

Work with your PG&E representative to:

- Schedule any construction work to be completed by PG&E.
- Establish a new account if the location has not previously received electric service from PG&E.

8 Schedule inspection and meter connection

Arrange for the appropriate local government agency to inspect the electric panel. Once it has passed inspection contact PG&E to schedule the meter connection.

For more information on how PG&E can help with building and renovation projects for your home visit **www.pge.com/building** or call **1 877 743 7782**.

August 2013 CMM-1210-0758

Appendix C - Existing DMP and GSP Excerpts

1. DMP Excerpt
2. GSP Excerpts

ARVIN-EDISON WATER STORAGE DISTRICT

DROUGHT MANAGEMENT PLAN

California Governor Edmund G. Brown, Jr. issued on April 1, 2015 Executive Order B-29-15, Provision 12 stated: "*Agricultural water suppliers that supply water to more than 25,000 acres shall include in their required 2015 Agricultural Water Management Plans a detailed drought management plan that describes the actions and measures the supplier will take to manage water demand during drought*".

In addition, the California Department of Water Resources (DWR) required those plans to include quantification of water supplies and demands for 2013, 2014, and 2015 (to the extent data is available), which information in included in Exhibit A. Section 3.2.4 of DWR's Final Agricultural Water Management Plan Guidebook provided guidance as assistance, which was followed in preparation of this Drought Management Plan.

This Arvin-Edison Water Storage District (AEWSD or District) Drought Management Plan details how the District prepares for droughts, manages water supplies and administers allocations during drought conditions. Some components or actions may require detailed review of conditions, policy changes, and long term capital improvements. Additionally, as conditions change and new technology and knowledge becomes available, opportunities and constraints will change.

A description of the water shortage allocation plan is further described below and as attached herein. In addition, the following components assist AEWSD in planning opportunities including, but not limited to, drought periods:

WATER BANKING AND WATER REGULATION

The District's Project, construction of which was initiated in 1964 and completed in 1968, reflects the implementation of a plan for the integrated management of a supplemental imported surface water supply with banked groundwater reserves providing **a true conjunctive use program** for firm deliveries to contract holders in Surface Water Service Areas (SWSA) as well as stabilized groundwater levels in the area.

As part of the conjunctive use and regulation needs, due to an erratic surface water supply, two key District owned, operated and maintained facility components are the spreading basins (about 1,500 acres), and the associated well fields (79 wells) through which water is stored and banked in the underground and later recovered when required. At its peak, the District had nearly 700,000 acre-feet of water stored in the underground set aside for drought years. A graphic displaying the accumulation of

underground storage amounts of annual water banked and water extracted over the history of the District is included in Exhibit B.

In addition to the traditional groundwater banking activities that assist the District to regulate wet period supplies into dry periods, the District makes maximum use of its water supply during wet periods by use of transfers and exchange agreements involving other districts whereby the partnering agency will receive water in wet periods and return water supplies to the District in dry periods. The District has long term agreements with a group of agencies called "Cross Valley Canal Exchangors", Metropolitan Water District of Southern California, and Rosedale Rio Bravo Water Storage District for such water management actions to regulate these wet period supplies into dry periods. In addition, the District typically has annual, as-needed, agreements with other local agencies including, but not limited to, it's neighboring Kern Delta Water District, who shares the same underground aquifer.

A graphic displaying the annual water management programs and water invested or water returned, from both groundwater banking activities and transfers/exchanges in any given year, is included in Exhibit B.

MONITORING HYDRAULIC LEVELS OR CONDITIONS

Statewide snow-water content (snowpack) conditions and reservoir levels plus forecasts of surface water supply declarations are monitored extensively, at times daily, by both District staff and as provided by other agencies through various sources including, but not limited to, internet based information (e.g. California Data Exchange Center, http://cdec.water.ca.gov/ and United States Bureau of Reclamation Central Valley Operations Office, http://www.usbr.gov/mp/cvo/).

Beginning in September of each year, the District reviews the data and subsequent year forecasts, and compares the information against historical declarations to roughly determine the potential drought affect on the District and its overall operation for the upcoming Water Year (which runs from March 1 to the end of February in the next calendar year). In addition to the research performed by its own staff, the District attends frequent United States Bureau of Reclamation water supply meetings. This process is repeated as updated information becomes available.

The District also monitors water levels in the District owned and operated groundwater wells on a monthly basis when in operation (these wells are also known as "District

extraction facilities". In addition, the District performs bi-annual surveys of standing groundwater levels, during both spring and fall, in landowner wells within the District. The bi-annual surveys are used for various purposes including: groundwater depth, groundwater elevation, and annual change contour maps, as well as providing information for the District's water rate setting process (whereby the District's average surface water rates for the following year equate to average groundwater pumping cost estimates, so as to efficiently manage the basin and promote conjunctive use of both groundwater and surface water resources). The District actively examines its banked water account during wet or dry periods. It also monitors and manages its surface water "carryover" in reservoirs outside of the district. And, it monitors and manages water transfer and exchange accounts to regulate surface water supplies with water management partners outside of the district. Both of these reduce drought impacts.

PROCESS FOR DECLARING A WATER SHORTAGE AND IMPLEMENTATION

After review and presentation of all readily available surface and groundwater information by District staff, and following meetings with landowners/water users, the AEWSD Board of Directors officially inform and notify Surface Water Service Area (SWSA) water users by letters, which are both mailed and transmitted electronically (e-mail) to those registered with the District. Example letters to the water users from the District during the 2014 and 2015 water shortage periods are included in Exhibit C.

The District's Water Management Plan Attachment E (Water Shortage Statement from Rules and Regulations Page 15) describes the apportionment within the District during a water shortage period as follows:

> *Pursuant to powers granted by Section 43004 of the California Water Code and Article 2(l) of the Water Service Contracts, water will be apportioned within the District, in the event of a shortage, to each Water User upon the basis of the ratio of each Water User's acreage as listed in Exhibit "A" of each contract to the total acreage subject to the District's contracts for agricultural water service*.

OPERATIONAL ADJUSTMENTS INCLUDING CANAL, RESERVOIR, and GROUNDWATER MANAGEMENT

The District is able to meet the full water demands from the October through March time period solely by the use of groundwater banking facilities (which recover previously

recharged/banked water supplies), so no limitations or prorates are placed on water users during that time. However, during the April through September period, during severe drought, the irrigation demand exceeds groundwater bank supplies and surface water supplies must be regulated and imported in the reservoirs and canals that serve the District to meet peak irrigation demands. A general graphical description of the manner in which surface and groundwater supplies are managed within the District to demands is included in Exhibit D. The April through September six month period is then the focus of the prorate allocation, which consist of both available surface water and groundwater extracted by the District and subsequently deliveries are limited/prorated based on all available supplies.

During the prorated period, the District administers turnback/reallocation pools among water users in the District so as to move water allocations to other users at predetermined prices (for both sell and purchase) in order to protect customers from price-gauging. Water users are also allowed to form “Farming Units” in order to collectively manage water supplies amongst those willing to do that.

In addition to the previously banked groundwater that is extracted from District wells for its SWSA water users, the District transports/conveys landowner/water users’ own private wells in the District canal or pipeline distribution system to their desired turnouts. Water transfers from one field to another are allowed, as well as transfers from one water user to another.

During the 2014 drought conditions, the District revised its minimum 24 hour delivery rule to allow for more flexibility in water ordering. For example, instead of the typical 24 hour duration, water users were allowed to modify their irrigation request for *less than* 24 hour periods (e.g. 4, 8, or 12-hour sets). Water could be turned on or turned off as it best suited the water users need so long as proper communication protocols were followed. The letter notifying water users for the shift in the 24 hour delivery rule is included in Exhibit E. The rule was extended past the initial six month shortage period (in 2014) and continued to be instituted for the remainder of the year (even outside of the prorate period) and into the 2015 water year.

During drought times and when the District’s water supply is from groundwater bank wells (extraction of previously banked supplies), the District staff and its contractors are on-call for immediate well repairs so as to limit downtime and associated loss of water production. The District has also reached agreements with other agencies that allow the District to continue pumping its wells during off-peak or low demand periods and

subsequently exchange the well supplies for surface supplies at a later time (regulate the fall supply into a summer peak).

In addition, the District severely limits the use of its unlined reservoirs to eliminate water losses (that actually recharge to underground aquifer). The District has recently upgraded many of its facilities to replace its antiquated radial (undershot) gates with overshot gates that have increased in-canal (lined) storage capabilities, and plans to do more. The District also incorporated reverse flow capabilities (raised canal liner, reverse flow pumps, and check structures) to increase operational flexibility. The recent investments made to increasing storage capability assist in regulating groundwater bank supplies, which are generated at a constant rate and must be regulated to available demand centers.

DEMAND MANAGEMENT (POLICIES, INCENTIVES, ALLOCATION PLAN TO LOWER FARM WATER USE)

In addition to the turnback/reallocation pools, that typically move water from non-permanent lands/water users to those with permanent plantings, punitive surcharges are used to discourage water use in excess of a District allocation. An example of such practice was instituted in 2015 during the second consecutive water shortage period and is included in Exhibit F. The AEWSD Board of Director's also have the option to institute tiered prices, if necessary.

ALTERNATIVE WATER SUPPLIES

The District has increased its awareness of, and is actively investigating use of, recycled water opportunities from various sources (tertiary treated wastewater from adjoining cities, oilfield wastewater, and food processing wastewater).

STAGES OF ACTION

The initial stage is review of water supplies against historical demand patterns followed by an allocation of supplies, if necessary. If hydrologic conditions continue to worsen, allocations may be reduced. Upon a reduced allocation, District implements the various programs as described above (turnback/reallocation pools, landowner pump-ins, and delivery flexibility). The District continues to inform landowners/water users' with letters of any changed condition and/or water supply updates on an as-needed basis.

COORDINATION AND COLLABORATION

The District participates in multiple transfers and exchanges with agencies that involves many forums including but not limited to, agencies involved in the operation of Friant-Kern Canal, California Aqueduct, and the Cross Valley Canal. As previously mentioned the District also has multiple long term agreements and annual agreements that deal with specific water management actions.

The District is signatory to many joint power authority (JPA) organizations that hold frequent meetings. AEWSD's JPA affiliations include Friant Water Authority, Power and Water Resources Pooling Authority, Kern Groundwater Authority, and Kern River Watershed Coalition Authority. Other organizations the District is involved in include the Kern Integrated Regional Water Management Plan, Water Association of Kern County, and Association of California Water Agencies.

AFFECT ON REVENUES AND EXPENDITURES

The water shortage periods significantly *increase* the District expenditures based on extensive power requirements (groundwater bank extractions) and associated wellfield repairs. District revenues are *reduced* provided the decrease in water distribution (sold by volume). Therefore, during extended droughts, the District experiences both increases in expenditures and decrease in revenue. However, the District budget incorporates current water and power rates based on 30-year hydrology so as to stabilize long term rates, eliminate peaks/valley from year to year, and limit use of cash reserves. Furthermore, reserves are established and maintained to withstand multiple years of drought.

The District successfully passed a 218 election in 2015 to increase acreage assessments as a result of rising cost of water/power resources, capital improvement projects and new projects that expect to increase water supplies to the District, among other things.

The District is active in pursuing grant funds or low interest loans to the extent feasible for its projects/programs.

- Recharge policies exist across the Subbasin that allows on-farm banking as well as banking and exchanges with other districts in the region.
- Conservation and irrigation efficiency practices have been encouraged and incorporated both at the district and grower level.
- In-lieu use, diversions to storage, water recycling, conveyance, and extraction projects on managed on a district level in the Kern Subbasin.

(i) Efficient water management practices, as defined in Section 10902, for the delivery of water and water conservation methods to improve the efficiency of water use.

- KGA Member Agencies are constantly pursuing efficiency with their water management practices through management plans as outlined in the management area plans.

(j) Efforts to develop relationships with state and federal regulatory agencies.

- Many of the member agencies under KGA hold state and federal water contracts as well as work closely with DWR on projects and management practices. Refer to management area plans for further details.

(k) Processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity.

- There are a number of water use and land use programs member agencies are involved in within the Kern Subbasin that require land use plans. Refer to management area plans for further details.

(l) Impacts on groundwater dependent ecosystems.

- This element is covered in the KGA Umbrella Chapter, Section 2.3.8, as well as the individual management area plans.

2.1.5 Notice and Communication

SGMA requires that GSAs consider the interests of all beneficial uses and users of groundwater and to encourage and include them in the GSP development process. To capture the intent of SGMA, as legislation better served under local control, KGA member agencies played a vital role in the development of this GSP. This process included communication and outreach at the local level, with each KGA member agency engaging with its beneficial users to gather vital input, data, and feedback to ensure the success of this GSP and individual management area plans.

In May of 2018, the KGA initiated the development of a Communication and Engagement Plan (C&E Plan) (Attachment E) to facilitate and assist KGA member agencies in stakeholder engagement and outreach. KGA communication and outreach consisted of stakeholder meetings and workshops; maintaining an interested parties list for KGA events; and development of a Stakeholder Survey and Agricultural Survey for the benefit of KGA member agencies. In

addition to outreach and communication through the KGA, each member agency was tasked with conducting their own communication and outreach to better capture the diverse needs of their beneficial users within their jurisdictional areas. By receiving information directly for member agencies using a local control approach, users greatly benefitted.

For more detailed information on KGA member agency communication and outreach efforts please see the member agencies' management area plans.

2.1.5.1 Description of Beneficial Uses and Users in the Subbasin

As was previously stated, as required by SGMA, GSAs must consider the interests of all beneficial uses and users of groundwater and include them in the GSP development process. For the KGA and its member agencies, beneficial users are stakeholders who have an interest or a need in groundwater use within the boundaries of the KGA. With the development of the C&E Plan the focus was to address the opportunities for engagement and to encourage participation by beneficial users. Located within the C&E Plan are lists of beneficial users as well as a stakeholder engagement timeline based on phases of the GSP development and implementation processes. The engagement timeline for the KGA are shown in the following figures; Figures 2-9, Phase 1: GSA Formation and Coordination; Figure 2-10, GSP Preparation and Submission; and Figure 2-11, GSP Review and Evaluation.

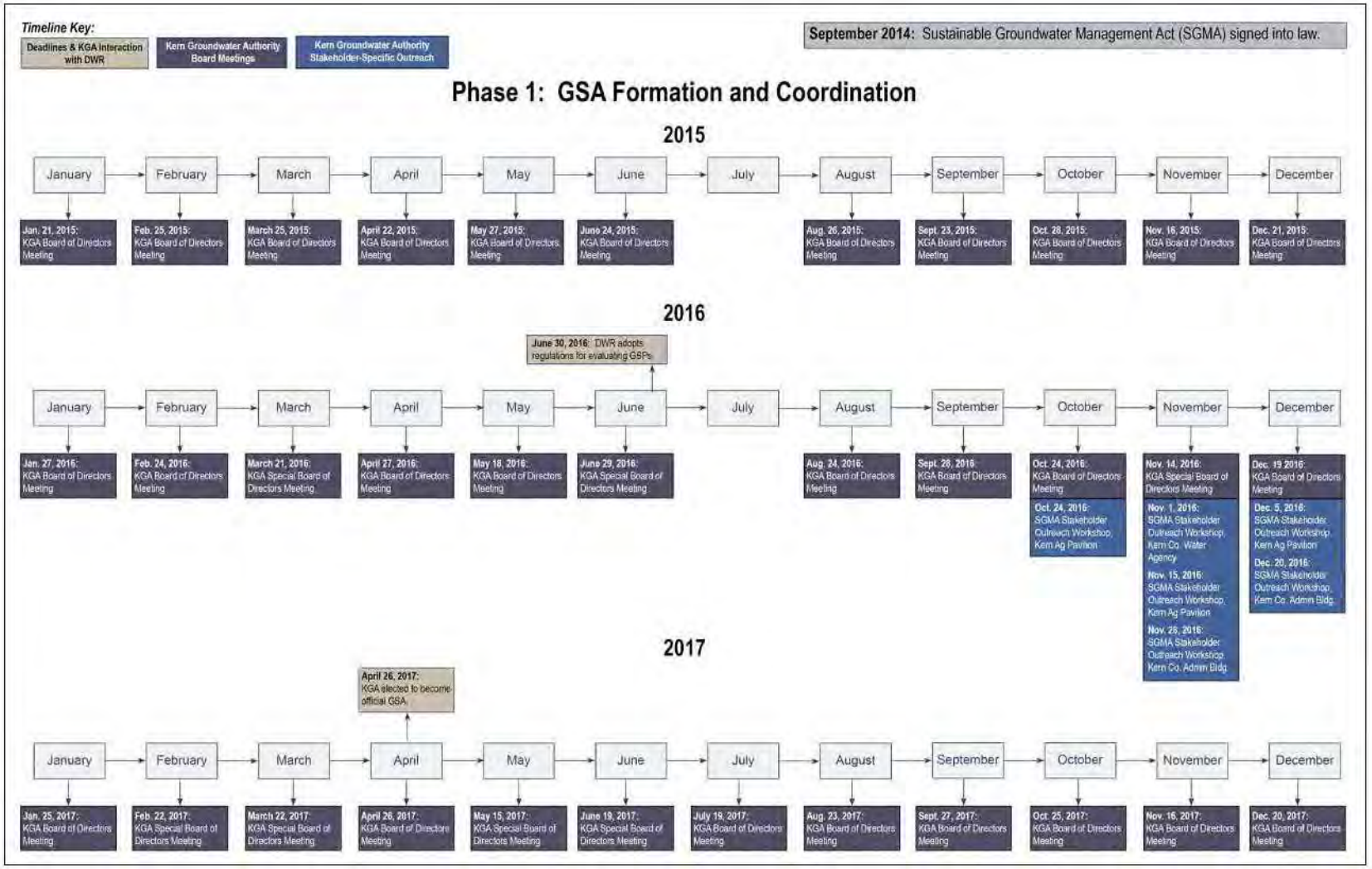
Another component of the C&E Plan was the development of the interest parties list. The interested parties list began development immediately and is constantly updated to include all interested parties who sign in/attend any of the monthly meetings held by the KGA and/or its member agencies.

The development of the Stakeholder Survey and Agricultural Survey was a vital instrument in the KGA outreach during the process of the development of the management area plans. To capture as many diverse beneficial users as possible, the Stakeholder Survey was developed in both English and Spanish and was available at workshops, stakeholder meetings, and both were accessible on the KGA website where they could be completed online. The information provided by the beneficial user assisted the KGA member agencies in the development of their projects and management actions. These surveys are located on the KGA website and can be completed online anytime during the process of the development of the management area plans. Monthly, the KGA took the information provided from those surveys and provided a summary report to the KGA Board of Directors, the KGA member agency managers, and to the public for their consideration.

2.1.5.2 Communication

Decision-Making Process

KGA was formed by a JPA that stipulates that each member agency has the sole right and responsibility to develop and implement SGMA within its respective boundaries; however, the KGA Board is the final decision-maker for the KGA and its member agencies, except for the implementation of SGMA within a management area. Implementation of SGMA is to be governed by the member agency within its jurisdiction.



Provost & Pritchard Consulting Group • Updated December 2019

Figure 2–9. Kern Groundwater Authority's Communication & Engagement Timeline – Phase 1: GSA Formation and Coordination

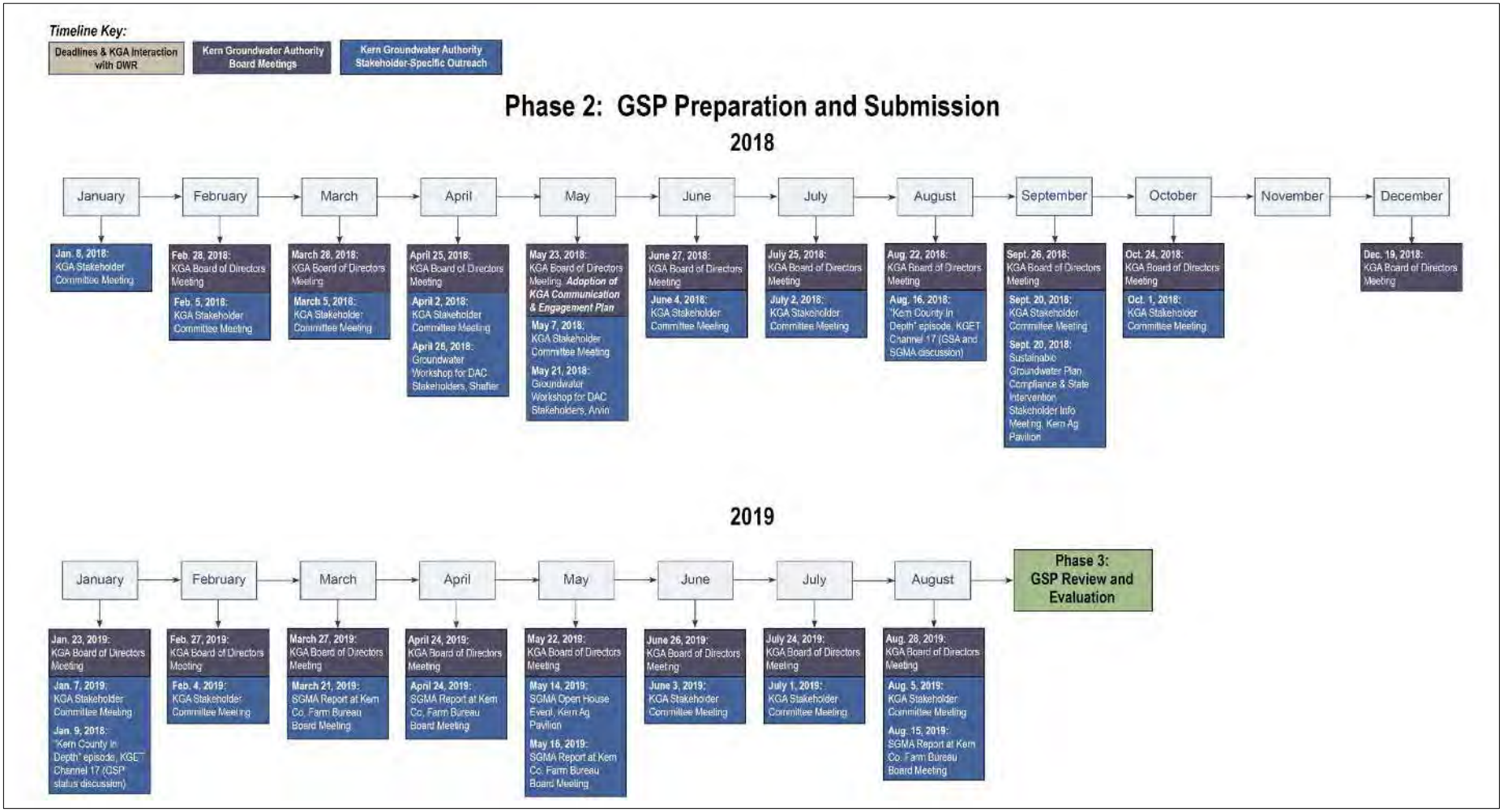


Figure **2-10**. Kern Groundwater Authority's Communication & Engagement Timeline – Phase 2: GSP Preparation and Submission, and Phase 3: GSP Review and Evaluation

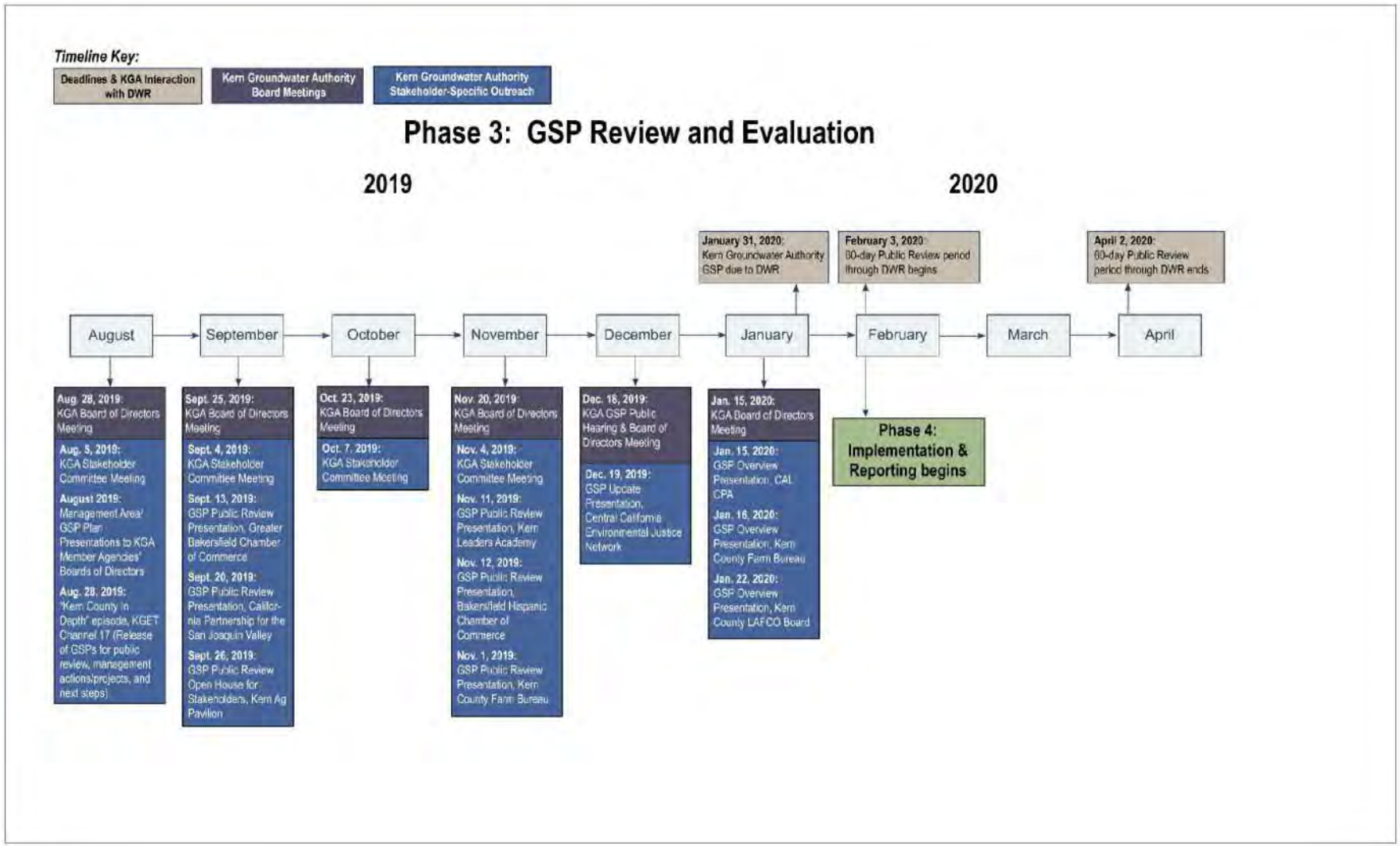


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Figure 2.11. Kern Groundwater Authority's Communication & Engagement Timeline – Phase 3: GSP Review and Evaluation

The JPA is written to provide open and transparent communication to all beneficial users; thus, the KGA's decision-making process consists of several public meeting opportunities:

- The KGA Board of Directors public meetings are on the fourth Wednesday of every month and include presentations regarding the development of the GSP as well as decisions on coordinated SGMA requirements with the other GSAs in the Subbasin. Public meetings also include administrative and financial decisions. Meeting notification includes public posting of the board agenda and background materials on the KGA website and an email notification to the interested parties list a week prior to the meeting, which also includes all relevant meeting materials.
- As the Subbasin GSPs were developed, KGA and the other GSAs established coordination meetings. These meetings began in July 2018 to coordinate each of the five GSPs scheduled to be developed and submitted to DWR. These meetings are held every Friday morning and are attended by all KGA member agency managers and the other four GSA managers. These meetings included discussions to obtain an understanding and consensus on the data and methodologies used in the five GSPs. Once an understanding and consensus was reached, the data and methodology were then discussed at the Kern GSA Coordination Committee meeting, where each of the five GSAs are represented by a policy or board member and a staff manager, as well as at stakeholder public meetings.
- Stakeholder public meetings were held on the first Monday of every month where presentations were made concerning the development of this GSP as well as items that need to be coordinated under SGMA with the other GSAs. These meetings began under the name of the Coordination Committee and then changed to Stakeholder meetings in 2018. Typically, meetings were open discussions with occasional presentations for specific GSP elements. If there were no new developments on the GSP, meetings were cancelled to take into consideration beneficial users' time. All meeting dates and presentation materials are located on the KGA website with email notifications sent out to the interested parties list prior to meetings, which included all relevant meeting materials.
- Kern GSA Coordination Committee meetings were established to coordinate the data and methodologies at a policy-level. These meetings were held on the third Wednesday of every month and were attended by one policy decision-maker from each of the GSAs and staff members to assist in the discussion. These meetings were established to maintain the coordination as well as the requirement of utilizing the same data and methodologies throughout the development of the five GSPs.

Public Engagement Opportunities

As previously stated, each KGA member implemented its own outreach programs to provide opportunities for beneficial users to participate in the development of individual management area plans. The details of these outreach programs can be found in the management area plans. However, the KGA held several public workshops, stakeholder meetings (mentioned above),

Farm Bureau meetings discussions, and media outreach. These meetings are listed in the C&E Plan and are also indicated in the list below.

2.1.5.3 Informing the Public about GSP Development Progress

KGA Website

The website was established immediately upon approval as an exclusive GSA and is updated monthly with materials from all the meetings including presentation materials and board packages. There is also a Resource & Outreach tab that provides the technical reports and workshop materials.

Interested Parties List

An email distribution list of stakeholders and beneficial users was developed and is constantly updated for outreach and notices throughout the GSP planning process. The list is maintained and updated by the KGA and is included in the C&E Plan.

Media

The KGA has participated in several media segments televised by Kern Golden Empire Television (KGET) Channel 17 – Kern County in Depth segment. There have been three tapings since the establishment of SGMA, one for the formation of the GSAs, the withdrawal of Kern County impacts to SGMA and the beginning process of the GSP, and the release of the GSP and the process moving forward. These are televised for a month and are also located on KGET Channel 17 website.

2.1.5.4 Public Comments

Public comments were collected throughout GSP development process and incorporated into the development of KGA Umbrella GSP and the management area plans of the KGA members, as described above. Additionally, the KGA prepared a Public Draft Kern Groundwater Authority Groundwater Sustainability Plan in August 2019. The draft KGA GSP was made available during a noticed public comment period from August 30, 2019 to November 28, 2019. Comments received were considered and responded to either in this final version of the KGA GSP or were forwarded to the appropriate KGA member agency for their consideration. All comments received and responded to those comments are included in Attachment F.

2.2 Basin Setting

This basin setting focuses on the area encompassed within the jurisdiction of the KGA, its participating members agencies, and collaborators. Figure 2-1 presents the current extent of the KGA jurisdictional area and member agencies. Due to the proximity of adjacent GSAs, details and data from adjacent GSAs are included herein. This basin setting is intended to represent an overview of the entire Subbasin. Additional details are included in the basin setting description of other GSPs prepared in the Subbasin and in the management area plans prepared by KGA member agencies.

consultant's analysis of FWA and DWR information and are therefore consistent with the basin-wide approach.

2070 Climate Change Scenario

☑ 23 CCR § 354.18(d)(3)

In order to estimate the potential effects on the projected water budget of climate change towards the end of the planning and implementation horizon (i.e., 50 years out into the future), a water budget scenario based on 2070 "central tendency" climate change factors published by DWR was developed. It should be noted that estimates of climate change impacts on water supplies this far into the future have significant uncertainty[76]. For this scenario, precipitation and ET were both adjusted based on the 2070 "central tendency" change factors published by DWR. CVP water supplies were taken from the FWA projections under the "2070.c scenario". SWP supply projections were taken from the DWR 2070-Level CalSim studies, except for years 2004-2007 which were taken as the actual SWP data, adjusted for the OCAP BO and reduced by 8.09%, and years 2008-2014 which were taken as the actual SWP data, reduced by 8.09%. Again, the assumptions upon which this scenario was based are from the KGA consultant's analysis for FWA and DWR (CalSim) information and are therefore consistent with the basin-wide approach.

9.4.3. Additional Surface Water Supply Adjustments

☑ 23 CCR § 354.18(c)(3)(C)

As described in **Section 9.2.1 *Surface Water Inflows and Outflows***, in addition to its CVP contracts, AEWSD actively and regularly pursues additional surface water supplies through transfers, purchases, exchanges, and banking programs as a means of increasing supply reliability during extended periods of drought and/or regulatory restrictions. From DWR Water Years 1995 - 2015, AEWSD has obtained roughly 1.50 million AF of additional water supplies through agreements with over 70 entities, comprising approximately 41% of total surface water imports to AEWSD during that period (**Figure WB-6**).

Given the considerable uncertainty surrounding the future availability of non-CVP water supplies to AEWSD, AEWSD has taken a conservative approach by applying a 50% reduction to the initial estimates of projected SWP and Kern River imports through the Cross-Valley Canal, Intertie Pipeline, and Kern River conveyance systems entering the District under the Baseline, 2030, and 2070 scenarios described above. This adjustment was made to reflect the possibility that under SGMA implementation, AEWSD may not be able to fully secure additional, non-CVP water supplies via transfers, exchanges, and/or purchases to the extent that they have been able to achieve historically. This approach therefore provides a more conservative estimate of the potential future impacts of reduced surface water supply reliability to AEWSD, and is subsequently used to inform the development of Projects & Management Actions within the Arvin-Edison Management Area (see **Section 17 *Projects and Management Actions***). In all cases AEWSD will continue to implement its policy of aggressively pursuing additional, non-CVP water supplies in order to maintain maximum availability and reliability of surface water imports going forward.

[76] Alternative perspective on climate change impacts: https://townhall.com/columnists/pauldriessen/2019/01/19/climate-hysterics-skyrocket-n2539295

under the old Kern Lake bed and the sloughs and swamp and over-flowed land connected to it are another factor.

The relative highs and lows within the Arvin-Edison Management Area appear to be controlled, at least in part, by the distribution of groundwater pumping versus surface water deliveries; areas within AEWSD's Surface Water Service Area (SWSA) (see **Figure GWC-3**) tend to exhibit higher groundwater elevations than areas outside of the SWSA that rely exclusively on groundwater. As discussed above, the "barrier" effects of White Wolf Fault and Edison Fault also tend to cause higher groundwater levels on the upgradient sides, due to "backing up" of water. Groundwater gradients are steepest in the vicinity of the Edison Fault, although spatial water level data coverage in that area is limited.

Depth to Groundwater

As shown on **Figure GWC-4**, depth to groundwater for "current conditions" in Spring 2015 within the Arvin-Edison Management Area varies from 149 to 535 ft bgs.[41] Most of the Arvin-Edison Management Area had depths to water of between 300 and 400 ft bgs, with relatively greater depths in the east-central area where the land surface rises, and lesser depths in the far southwest and far northeast. The shallowest depth to water, 149 ft bgs, was measured in a well near Caliente Creek, which may be indicative of recharge occurring in this area but may also be influence by barrier effects of the Edison Fault. Even for this shallowest measurement, the relatively deep depths to water in the principal aquifer system indicate that interconnected surface water and groundwater-dependent ecosystems are unlikely to occur in the Arvin-Edison Management Area. These topics are discussed further below in **Section 8.7 *Interconnected Surface Water Systems*** and **Section 8.8 *Groundwater Dependent Ecosystems***, respectively.

Long-Term Groundwater Elevation Trends

☑ **23 CCR § 354.16(a)(2)**

Long-term trends in groundwater levels were evaluated based on examination of hydrographs for 14 wells throughout the Arvin-Edison Management Area. Wells were selected for hydrograph analysis based on the length of record, their distribution throughout the Arvin-Edison Management Area, and their representativeness of conditions in their area. Hydrographs were developed for two periods: a long-term period from 1945 through spring 2018 which captures the entire operational history of AEWSD through the most recent available data (**Figure GWC-5**), and the more recent period from 1994 through 2015 which is consistent with the KGA period of interest (**Figure GWC-6**).[42] As shown on **Figure GWC-5**, for most wells in the northern, eastern, and southern portions the Arvin-Edison Management Area, groundwater levels have increased over the long-term, reflecting the increased storage resulting from the AEWSD's importation of surface water starting in 1966. This trend is in contrast to the large rates of groundwater level decline (approximately 8 to 10 feet per year [ft/yr]) that were occurring prior to the surface water importation. Wells within the central and western areas show either long-term stability or a long-term decline (i.e., well 31S29E34A001M located near the City of Arvin). Wells located in close proximity to AEWSD's spreading basins show larger fluctuations than other wells as a result of focused recharge and recovery pumping. The effects of drought cycles are also apparent, with greater declines during dry periods and recovery during wet periods. As shown on **Figure GWC-6**, over the more recent period from

[41] It should be noted that 2015 was the fourth year of a significant drought which led to zero surface water allocations on the Friant Kern system, thereby putting greater than normal demands on the groundwater system.

[42] **Figure GWC-6** shows data from 1994 through the most recent available data which is either fall 2017 or spring 2018. For the purposes of water level trend calculation, only the data from 1994 through 2015 (i.e., the KGA period of interest) were used.

1994 to spring 2018, the same general behavior and spatial patterns are apparent, except that the long-term increase in water levels due to surface water importation is largely obscured.

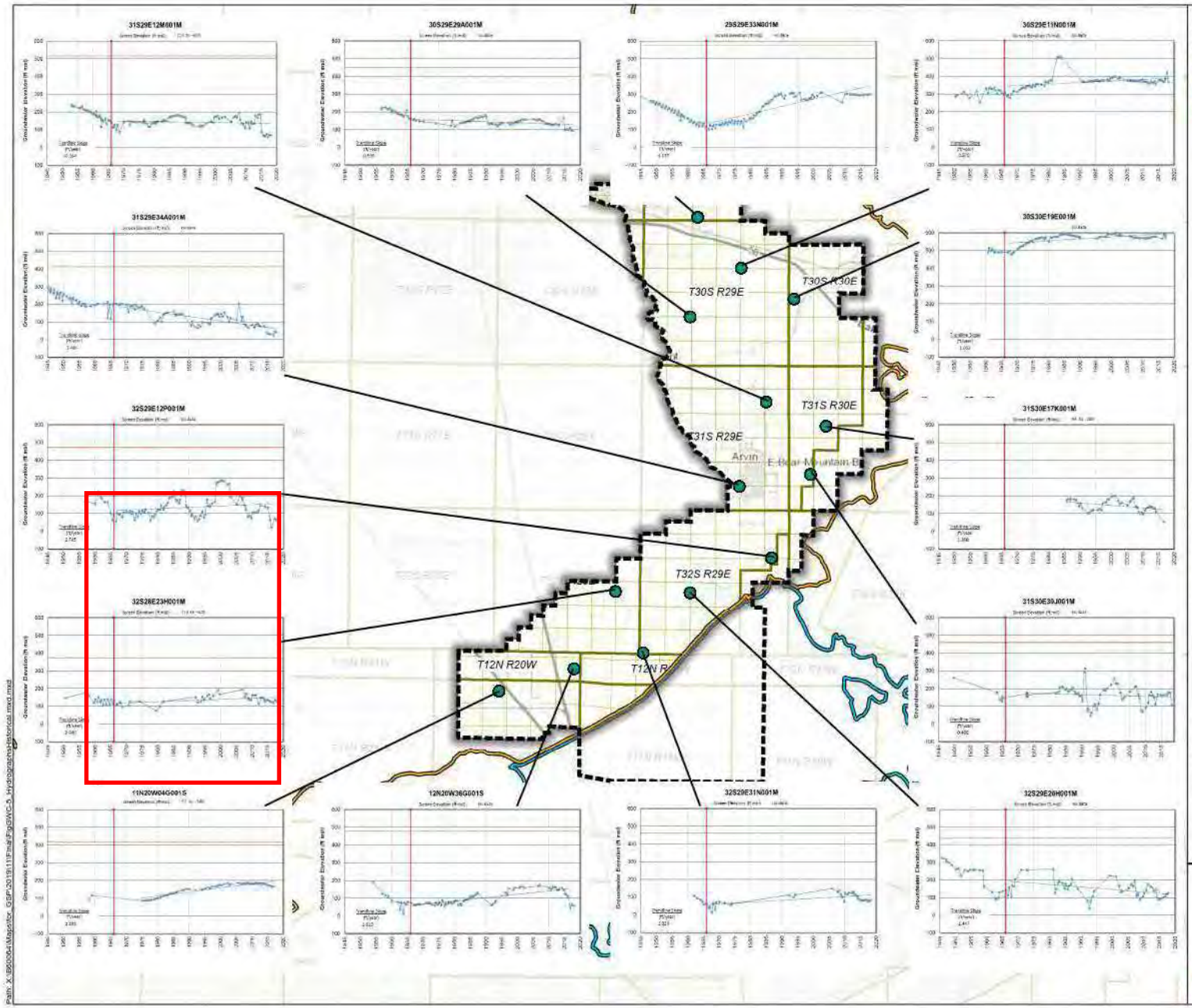
To evaluate long-term water level trends, linear regression of the water level data was used (recognizing that this method can be slightly biased by the data's temporal frequency and distribution). Based on hydrographs for 14 wells, over the period from 1966 (i.e., the start of surface water imports) through spring 2018, long-term water level trends range from increasing at up to 3.9 ft/yr to decreasing at up to 2.5 ft/yr. Of the 14 wells, six showed a decreasing trend over this time period and eight had an increasing trend. Over the period from 1994 through 2015 (i.e., the KGA period of interest), trends ranged from increases of 1.0 ft/yr to decreases of 4.1 ft/yr, with 12 wells decreasing and two wells increasing.

Table GWC-1 below shows the DWR Water Year Hydrologic Classification Index for the San Joaquin Valley (i.e., water year type)[43,44]. Based on the DWR San Joaquin Valley Water Year Index for the 21 Water Years from 1995 through 2015, the period included five "critical" (dry) years (24%), four dry years (19%), two below normal years (10%), three above normal year (14%), and seven wet years (33%). The first third of this period was relatively wet, the middle third was a mix of wet and dry years, and the last third of the period was extremely dry. This climatic factor is reflected in the hydrographs which tend to exhibit water level increases in the 1990s, relative stability in the early 2000s, and then greater decreases starting in the late 2000s.

Table GWC-1. Summary of DWR Water Year Types, 1995 - 2015

Water Year	WY Index	Water Year	WY Index	Water Year	WY Index
1995	Wet	2002	Dry	2009	Below Normal
1996	Wet	2003	Below Normal	2010	Above Normal
1997	Wet	2004	Dry	2011	Wet
1998	Wet	2005	Wet	2012	Dry
1999	Above Normal	2006	Wet	2013	Critical
2000	Above Normal	2007	Critical	2014	Critical
2001	Dry	2008	Critical	2015	Critical

[43] http://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST
[44] DWR defines a Water Year as extending from October 1 of the previous year to September 30 of the year in question. For example, Water Year 2005 extends from 1 October 2004 through 30 September 2005.



Legend

- Arvin-Edison Water Storage District

Groundwater Subbasin

- Kern County (DWR 5-022.14)
- White Wolf (DWR 5-022.18)

Abbreviations

AEWSD	=	Arvin-Edison Water Storage District
DWR	=	California Department of Water Resources
ft bgs	=	feet below ground surface
ft msl	=	feet above mean sea level

Notes

1. All locations are approximate.
2. Hydrographs show the reference point elevation in solid orange line. Water levels from 1994 through 2004 are based on "spring" and "fall" measurements, assumed to occur on April 1 and October 1 of each year, respectively.
3. Water levels that showed a rate of change between consecutive measurements greater than 50 ft in 60 days, or a significant change without a reasonable hydrological explanation, were removed from the hydrographs.
4. Hydrograph trendlines are based on linear regression and only consider data since 1966 (i.e., since AEWSD began importing surface water).

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 22 November 2019.
2. Water level information obtained from AEWSD on 30 November 2017.

N

0 4 8

(Scale in Miles)

Historical (1945-2018) Groundwater Elevation Hydrographs

Arvin-Edison Water Storage District
Kern County, California
December 2019
B60064.01

Figure GWC-5

eki environment & water

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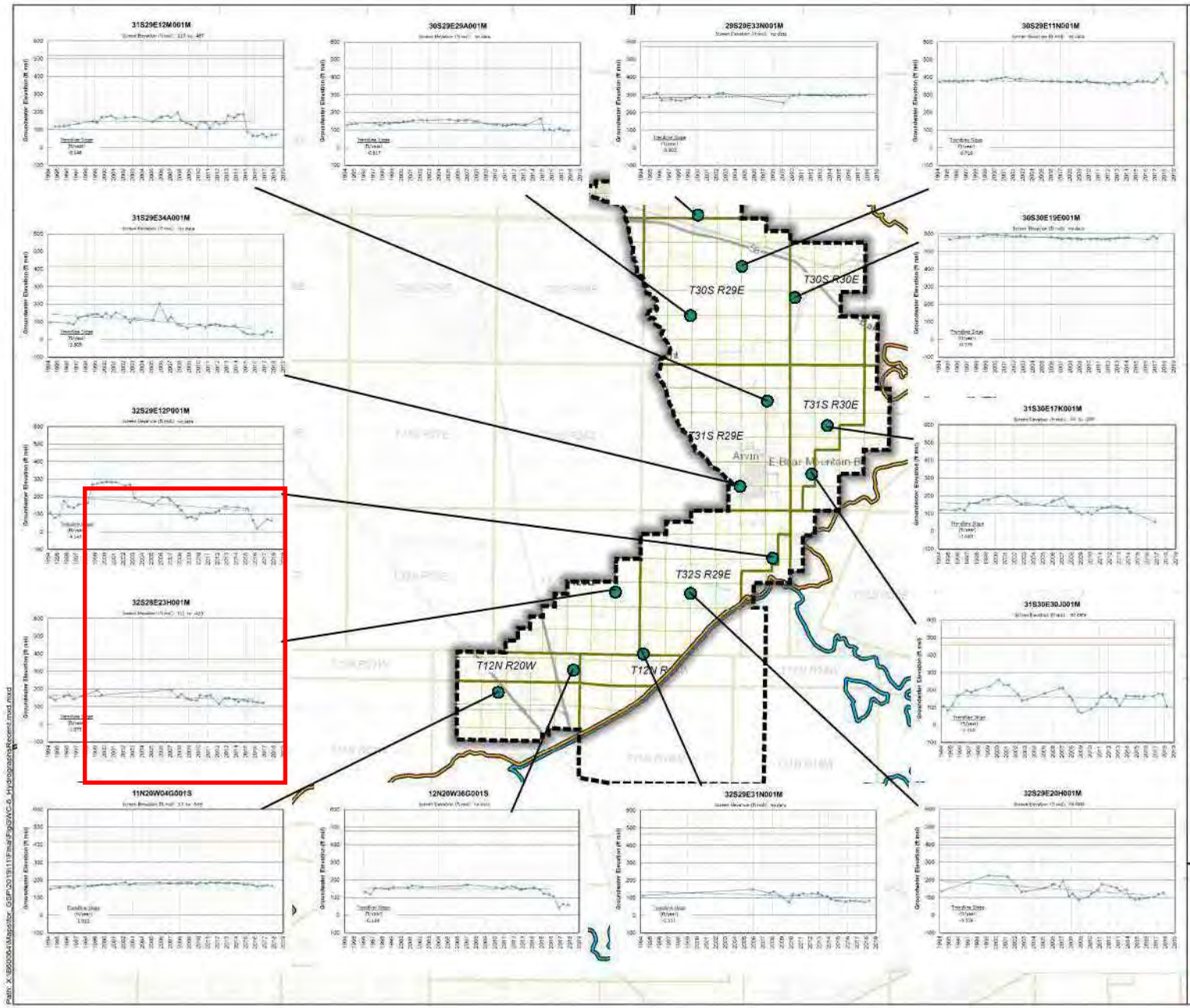

Legend

Arvin-Edison Water Storage District

Groundwater Subbasin

Kern County (DWR 5-022.14)

White Wolf (DWR 5-022.18)

Abbreviations

AEWSD	=	Arvin-Edison Water Storage District
DWR	=	California Department of Water Resources
ft bgs	=	feet below ground surface
ft msl	=	feet above mean sea level
KGA	=	Kern Groundwater Authority

Notes

1. All locations are approximate.
2. Hydrographs show the reference point elevation in solid orange line. Water levels from 1994 through 2004 are based on "spring" and "fall" measurements, assumed to occur on April 1 and October 1 of each year, respectively.
3. Water levels that showed a rate of change, between consecutive measurements points, greater than 50 ft in 60 days, or a significant change without a reasonable hydrological explanation, were removed.
4. Trendlines were based on linear regression and were calculated for the period 1994-2015, (i.e., the KGA period of interest).

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 22 November 2019.
2. Water level information obtained from AEWSD on 30 November 2017.

N

0 4 8

(Scale in Miles)

Recent (1994-2017) Groundwater Elevation Hydrographs

Arvin-Edison Water Storage District
Kern County, California
December 2019
B60064.01

Figure GWC-6

eki environment & water

Path: X:\B60064\Mapsfor_GSP\2019\11\Final\FigGWC-6_HydrographsRecent.mxd

9.4.4. Groundwater Banking Return Obligation

As described in **Section 5.2.3** ***Conjunctive Use in the Arvin-Edison Management Area***, AEWSD conducts banking and recovery operations within the Arvin-Edison Management Area for out-of-District entities including the Metropolitan Water District (MWD). As of May 2019, the "balance" in MWD's water bank account within the Management Area is approximately 153,000 AF. Because the MWD water banking agreement expires in 2034, and assuming that MWD would opt to have its entire balance recovered/returned by that time, the return obligation over the next 15 years to MWD is approximately 10,200 AFY. MWD/AEWSD could also mutually agree to extend the agreement. This return obligation can be met through delivery to MWD of groundwater or an equivalent volume of surface water supplies. This return obligation of banked water to MWD will be fulfilled, if possible, with wet period supplies, transfers/exchanges of surface waters, and otherwise with normal year supplies.

9.4.5. Projected Water Budget Results

Results of the projected water budget analysis are summarized in **Table WB-7** for both the entire water budget domain and for the groundwater subdomain, as well as in **Figure WB-22**. As shown in **Table WB-7**, water budget components are presented as averages over the 20-year historical period and averages over the 50-year analog period for the Baseline, 2030 Climate Change, and 2070 Climate Change scenarios. Water budget components are grouped into inflows and outflows, relative to the domain or subdomain they pertain to (also see **Figure WB-2**). Also shown in **Table WB-7** is the average annual change in groundwater storage for the historical period and each projected scenario. Results from **Table WB-7** were subsequently used to inform the development of Projects and Management Actions (P/MAs) as further described in **Section 17** ***Projects and Management Actions***. Implementation of the P/MAs described in **Section 17** were then input into the 2030 and 2070 projected water budget model scenarios to assess their estimated impacts to the groundwater balance within the Arvin-Edison Management Area. Results of this exercise are presented in **Table WB-8** and briefly mentioned below.

Baseline Scenario

In the Baseline Scenario, the water budget components that are not dependent on surface water imports differ only slightly from the historical period. The percent difference from the historical average period to the Baseline Scenario ranges from approximately -1.2% for natural surface water inflows to +3.5% for M&I consumptive use. This demonstrates that the 50-year analog period is a good representation of the historical conditions.

The water budget components that are dependent on surface water imports differ more significantly from the historical averages, due to the different assumptions about imported surface water availability under the Baseline Scenario, as discussed above. Though the total surface water imports component is only 1.2% lower under the Baseline Scenario than it is under the historical period, the supply source portfolio changes considerably relative to historical conditions within AEWSD. In particular, CVP supplies increase by approximately 35.3%, largely stemming from the assumptions incorporated by FWA (2018) to reflect the San Joaquin River Restoration Program (SJRRP) implementation, in particular the estimate of SJRRP Paragraph 16(b) "Recovered Water Account" supplies. This estimated increase in CVP deliveries is fully offset by a projected decrease in SWP and Kern River supplies, which are assumed to decrease by 57.7% and 56%, respectively, after applying the adjustments described in **Sections 9.4.2** and **9.4.3** above.

Overall, the Baseline Scenario indicates a net "surplus" (i.e., inflows greater than outflows) of approximately +1,700 AFY. If imported surface water supplies are assumed to be limited only to the CVP

source for which AEWSD has a contract (i.e., removing all future SWP and Kern River imports), the projected water budget for the Baseline Scenario indicates a net deficit (i.e., outflows greater than inflows) of approximately -13,900 AFY. Conversely, if imported SWP and Kern River supplies are assumed to occur in proportions similar to the historical period (i.e., only incorporating the Baseline change factors described in **Section 9.4.2 *Development of Projected Water Budget Scenarios***), then the Baseline Scenario indicates a net surplus of +16,800 AFY.

2030 Climate Change Scenario

Under the 2030 Climate Change Scenario, changes in precipitation, natural surface water inflows, and M&I consumptive use relative to the Baseline Scenario are all relatively small (i.e., relative changes of 0.8% to 2.9% and absolute changes of approximately 100 AFY to 600 AFY). The most significant changes relative to the Baseline Scenario is a reduction in surface water imports of approximately -32,000 AFY (-18.6%). Associated surface water exports and deliveries to the White Wolf Subbasin are also reduced on a proportional basis by approximately -4,100 AFY (-10.7%). Evapotranspiration is greater by approximately 6,000 AFY (+2.7%).

Overall, the 2030 Climate Change Scenario indicates a net deficit of approximately -31,600 AFY. Consistent with the approach being used by all KGA GSA members (and other GSAs in the basin), this estimated net deficit under the 2030 Climate Change Scenario is the amount that the Projects and Management Actions are targeted to address by the GSP implementation deadline (i.e., January 2040). It should be noted that, in addition to this net deficit, AEWSD will need to fulfill the groundwater banking return obligation to MWD discussed in **Section 9.4.4 *Groundwater Banking Return Obligation*** above. If imported surface water supplies are limited only to the CVP source, the projected water budget for the 2030 Climate Change Scenario indicates a net deficit of approximately -46,500 AFY. Conversely, if imported surface water supplies are to include full (climate-adjusted) SWP and Kern River supplies, the projected water budget for the 2030 Climate Change Scenario indicates a net deficit of approximately -17,500 AFY.

As shown on **Table WB-8** and further described in **Section 17.1.4 *Implementation Glide Path*** and in **Table PMA-2**, AEWSD has proposed to address approximately 70% of the projected deficit of -31,600 AFY by the GSP implementation deadline (i.e., January 2040) through adoption of supply augmentation projects (i.e., ~22,400 AFY), and may address the remaining 30% of the projected deficit (i.e., ~9,600 AFY) through adoption of demand reduction management actions as necessary in order to achieve and maintain the sustainability goal within the Management Area.

It should be noted that the results from the numerical model show that, upon implementation of the planned Projects and Management Actions, the Arvin-Edison Management Area is projected to achieve its sustainability goal (i.e., avoids Minimum Thresholds and Undesirable Results and achieve Measurable Objectives for Chronic Lowering of Groundwater Levels) (see **Section 17.8.2 *Evaluation Relative to Water Level Sustainability Criteria***).

2070 Climate Change Scenario

Under the 2070 Climate Change Scenario, changes in precipitation, natural surface water inflows, and M&I consumptive use relative to the Baseline Scenario are somewhat greater than in the 2030 Climate Change Scenario, but still not significant (i.e., relative changes of -2.1% to 6.9% and absolute changes of approximately 500 AFY to -1,500 AFY). Surface water imports are lower by approximately -58,400 AFY (-33.9%). Surface water exports and deliveries to the White Wolf Subbasin are also lower by approximately -15,500 AFY (-40.9%). Evapotranspiration is greater by approximately +13,300 AFY (+6.0%).

Overall, the 2070 Climate Change Scenario indicates a net deficit of approximately -56,300 AFY. If imported surface water supplies are limited only to the CVP source (i.e., removing all future SWP and Kern River Imports), the projected water budget for the 2070 Climate Change Scenario indicates a net deficit of approximately -68,800 AFY. Conversely, if imported surface water supplies are to include full (climate-adjusted) SWP and Kern River supplies, the projected water budget for the 2070 Climate Change Scenario indicates a net deficit of approximately -44,000 AFY.

As shown on **Table WB-8** and further described in **Section 17.1.4 *Implementation Glide Path*** and in **Table PMA-2**, AEWSD has proposed to address approximately 72% of the projected deficit of -56,300 AFY by the end of the 50-year GSP planning and implementation horizon (i.e., January 2070) through adoption of supply augmentation projects (i.e., ~40,800 AFY), and may address the remaining 28% of the projected deficit (i.e., ~15,700 AFY) through adoption of demand reduction management actions as necessary in order to achieve and maintain the sustainability goal within the Management Area.

It should be noted that the results from the numerical model show that, upon implementation of the planned Projects and Management Actions, the Arvin-Edison Management Area is projected to achieve its sustainability goal (i.e., avoids Minimum Thresholds and Undesirable Results and achieve Measurable Objectives for Chronic Lowering of Groundwater Levels) (see **Section 17.8.2 *Evaluation Relative to Water Level Sustainability Criteria***).

4 Projects and Management Actions

4.1 Proposed Projects and Management Actions

Projects and management actions for the KGA have been developed at the management area level. Table 4-1 (provided at the end of this section) provides a summary list of all projects and management actions being considered for implementation by each member agency, including the project title, implementation status, a brief description of the project, and benefits associated with the project. The details of each proposed project and management action can be found in each member agency's management area plan.

In addition to the projects and management actions that are proposed by the KGA members, the KGA has identified projects and management actions that it will implemented to further the coordination of groundwater management in the Subbasin. Table 4-2 list these proposed projects and management actions. These efforts will be managed by the KGA and will be cost-share through agreements with KGA members and other GSAs in the Subbasin, as appropriate.

Table 4-2: Kern Groundwater Authority Projects and Management Actions

Project Name	Project Description
Subsidence Monitoring (basin-wide)	Improve the understanding of the causes and impacts of subsidence in the Subbasin. Implementation Period: 2020 to 2025
Groundwater Modeling (basin-wide)	Improve the understanding of groundwater reactions to the implementation of projects and management actions, relationship to minimum thresholds and measurable objectives, determination of the native yield of the Subbasin, and subsurface flow within and out of the Subbasin. Implementation Period: 2020 to 2025
Study of Native Yield of the Subbasin	Studies to refine the understanding and allocation of the available native groundwater yield within the Subbasin. Implementation Period: 2020 to 2025
KGA Monitoring Network Improvement Program	The KGA will work with its member entities, and other Subbasin GSAs, to continue to improve and reach SGMA compliance for identified representative monitoring sites. The KGA will work to identify joint projects and programs to ensure efficient installation and/or rehabilitation of monitoring wells and data collection and reporting efforts. Implementation Period: 2020 to 2025.
Basin-wide Coordination	Continuation of the Kern Subbasin Managers Group to coordinate water management activities in the Subbasin, including technical analysis, project management and coordination, identification of joint management opportunities and coordination of SGMA reporting requirements to DWR. Implementation Period: 2020 to ongoing
Annual Reporting	Coordination and facilitation of annual SGMA reporting requirements. Implementation Period: 2020 to ongoing

The Subbasin includes a complex environment of various local and imported surface water supplies; variable access to groundwater supplies based on quantity and quality; water

management authorities; extent and capacity of water management infrastructure; and fiscal relationship with local landowners for participation in water management programs. Each of the member agencies within the KGA has identified projects and management actions best suited to meet the conditions of sustainability within their respective management areas within the water management and authorities of its entity. Collectively these projects and management actions are designed to maintain or achieve sustainability and the avoidance of undesirable results, first within the management area and then collaboratively throughout the Subbasin. The KGA, the KGA/GSA Managers Group and the Kern SGMA Coordination Committee will monitor the progress of project and management action implementation against reported groundwater conditions and performance to measurable objectives and interim milestones. Through this coordination effort opportunities will be explored for collaboration in implementing projects and management actions, as has been historically accomplished in the Subbasin, for joint conveyance as well as recharge and banking projects, as an example.

Table 4-1 list more than 150 projects and management actions. This includes management projects ranging from expansion of local and regional conveyance and recharge facilities to take advantage of surplus supplies; new conveyance and recharge projects; and participation in the California Water Fix or other thru-Delta improvement projects. Management actions range from implementing district level fee structures to incentive reduced groundwater pumping; participation in local, regional, and state-wide water markets; and setting allocation for groundwater use by landowner, based on the sustainable yield of the management area.

Table 4-1 also demonstrates the tremendous capacity of the entities in the Subbasin to implement projects and management actions to manage the Subbasin sustainably. As the KGA and the other Subbasin GSAs progress to 2040, the implementation of projects and management actions will be adaptively managed to ensure that the proper mix of projects or management actions are developed to avoid undesirable results. Each management area plan as developed its own adaptive management strategy, which often entails some level of groundwater pumping reductions if proposed project or management action are not realized or are not as effective as anticipated.

4.2 Projected Future Water Budgets with SGMA Implementation

Projected water budgets with implementation of the projects and management actions described in the previous section were developed using the C2VSimFG-Kern to evaluate the performance with respect to achieving groundwater sustainability. Proposed projects and management actions were simulated under Baseline conditions, 2030 Climate Conditions and 2070 Climate Conditions using the C2VSimFG-Kern. Detailed description of proposed SGMA projects, and management actions are provided in *Attachment H: Historical and Projected Future Water Budget Development with C2VSimFG-Kern*.

4.2.1 Future Baseline Water Budget with SGMA Implementation

The Baseline Scenario with Projects simulates the implementation of proposed projects and management actions applied to the Baseline Scenario. No other changes were made except for the addition of the projects to provide a direct comparison of the relative benefits of the over

400,000 AFY of proposed SGMA projects and management actions. The change in groundwater storage for projected future baseline with SGMA Projects improves by about 409,904 AFY. This change results in a net gain in groundwater in aquifer storage over the WY2041 to WY2070 sustainability period of about 85,578 AFY.

Figure 4-1 shows the comparison of the average annual water budget components for the two different Baseline Scenarios. Over this period, the average groundwater pumping of 1,354,000 AFY for the Baseline Scenario with SGMA Projects (which includes agricultural pumping, urban pumping and exported water) is over 270,000 AFY less than the Baseline Scenario.

4.2.2 2030 Climate Change Water Budget with SGMA Implementation

The 2030 Climate Scenario with SGMA Projects simulates the implementation of proposed projects and management actions applied to the 2030 climate change conditions. No other changes were made to this scenario. A comparison of the average annual water budget components for the two 2030 Climate Scenarios is presented in Figure 4-2. The change in groundwater storage for projected 2030 Climate Scenarios condition with SGMA Projects improves by about 418,949 AFY. This change results in a net deficit in groundwater in aquifer storage over the WY2041 to WY2070 sustainability period of about 46,829 AFY. Over this period, the average groundwater pumping of 1,444,300 AFY for the 2030 Climate Scenario with SGMA Projects, which includes agricultural pumping, urban pumping and exported water, is over 290,000 AFY less than the 2030 Climate Scenario without SGMA Projects.

4.2.3 2070 Climate Change Water Budget with SGMA Implementation

The 2070 Climate Scenario with SGMA Projects simulates the implementation of proposed projects and management actions applied to the 2070 climate change conditions. No other changes were made to this scenario. A comparison of the average annual water budget components for the two different 2070 Climate Scenarios is presented in Figure 4-3. The change in groundwater storage for projected 2070 Climate Scenarios condition with SGMA Projects improves by about 426,367 AFY. This change results in a net deficit in groundwater in aquifer storage over the WY2041 to WY2070 sustainability period of about 45,969 AFY. Over this period, the average groundwater pumping of 1,559,000 AFY for the 2070 Climate Scenario with SGMA Projects, which includes agricultural pumping, urban pumping and exported water, is over 307,000 AFY less than the 2070 Climate Scenario without SGMA Projects.

A comparison of the annual change in groundwater storage over the 50-year hydrologic period for the baseline conditions, 2030 and 2070 climate condition for with and without projects is presented in Figure 4-4. The time series shows that change in groundwater storage has stabilized to slightly increasing over the period from WY2041 to WY2070 for with Projects condition.

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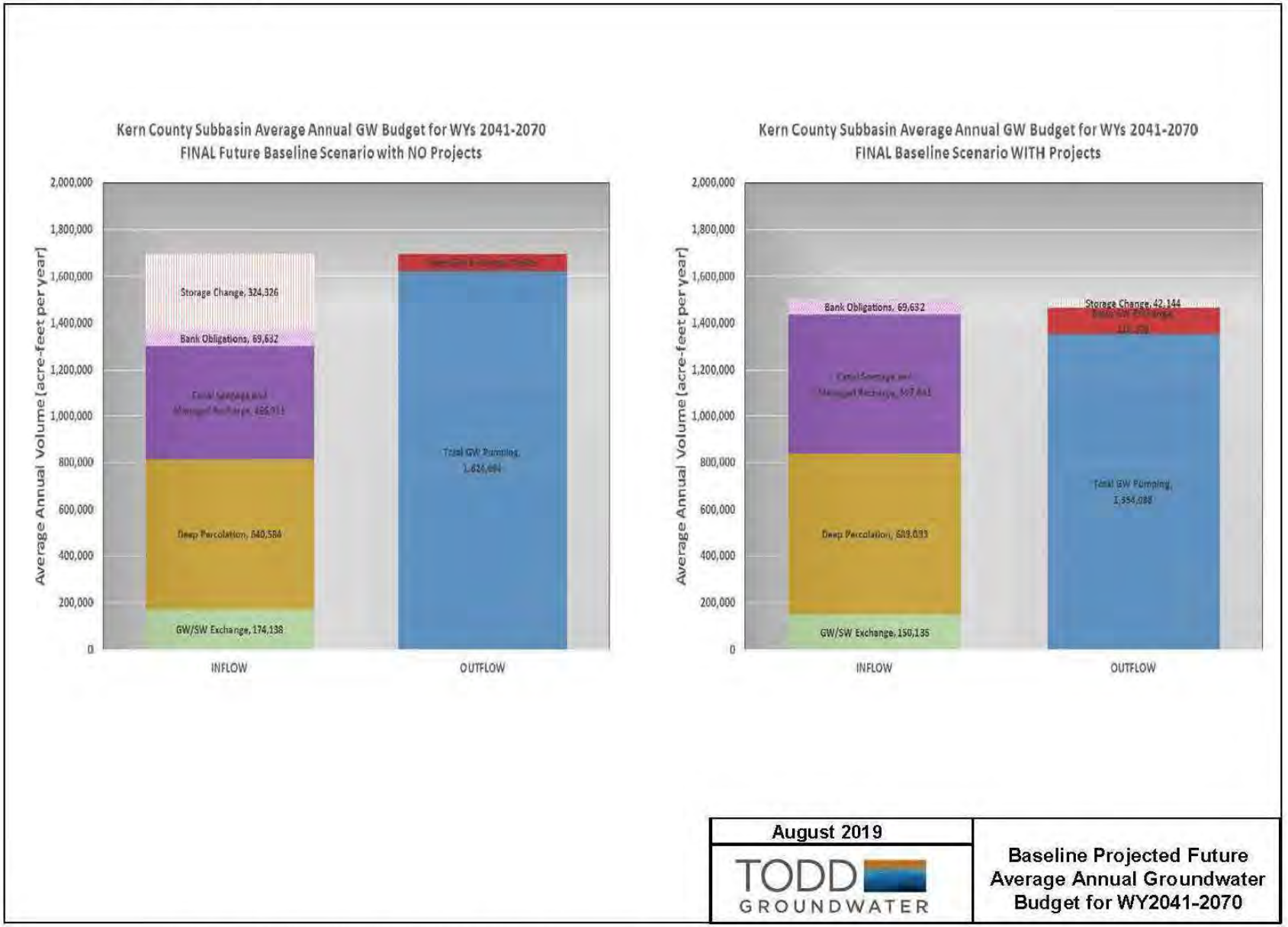

Figure 4-1. Baseline Projected Future Average Annual Groundwater Budget for WY2041-2070

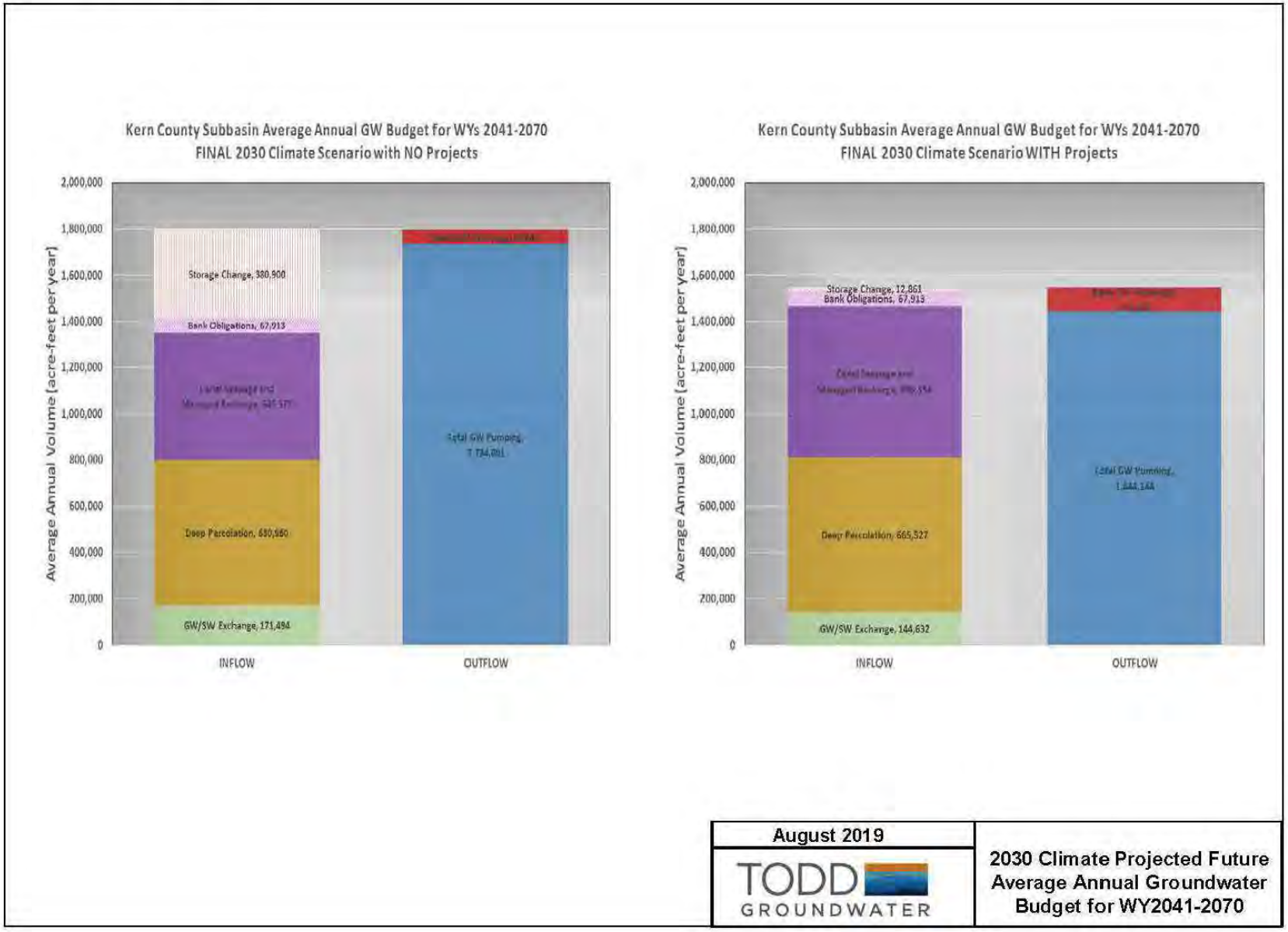

Figure 4-2. 2030 Climate Projected Future Average Annual Groundwater Budget for WY2041-2070

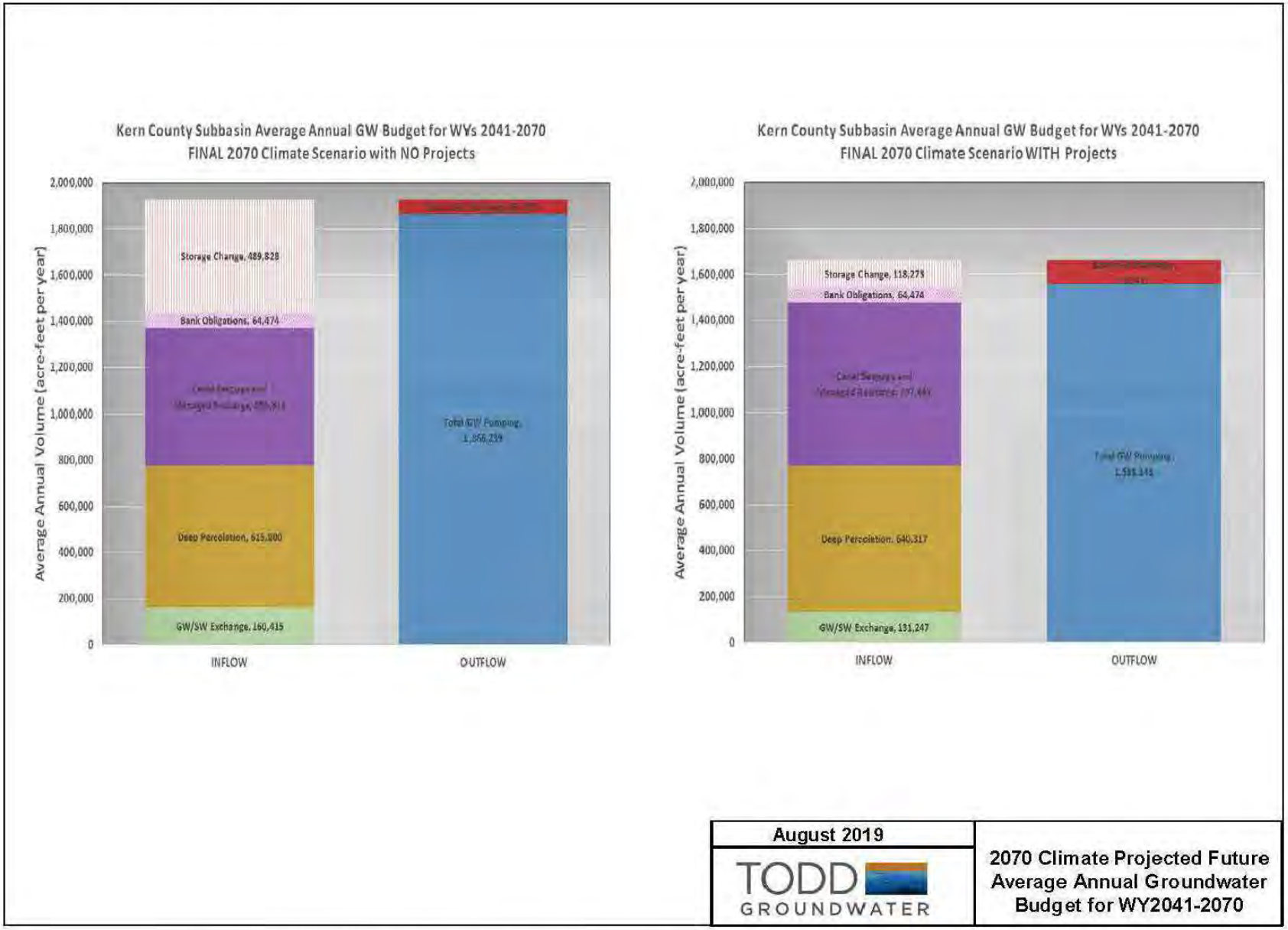

Figure 4-3. 2070 Climate Projected Future Average Annual Groundwater Budget for WY2041-2070

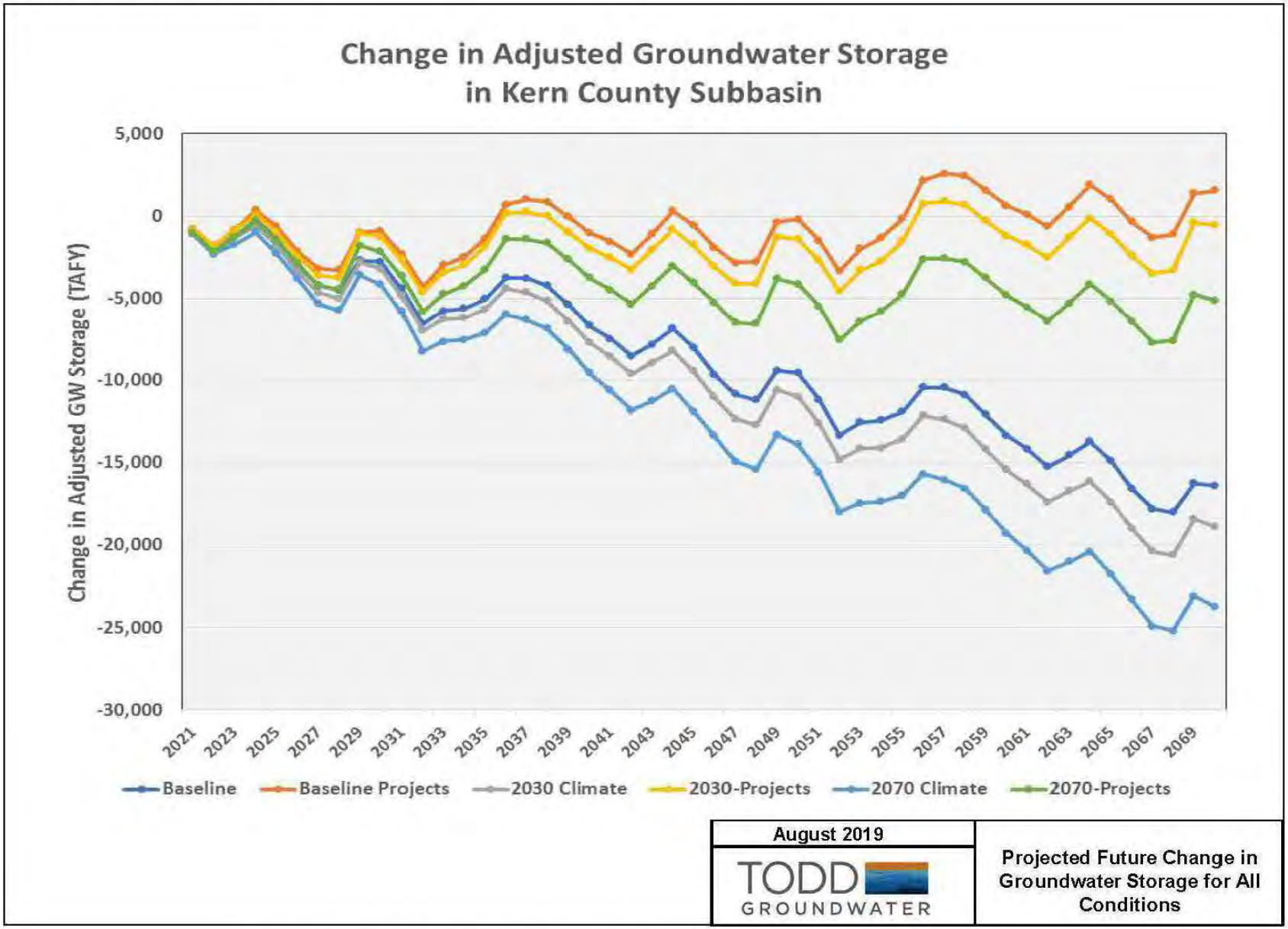

Figure 4-4. Projected Future Change in Groundwater Storage for all Conditions.

Table 4-1. Kern Groundwater Authority Member Entities List of Projects and Management Actions

Entity	Project Title	Implementation Status	Description	Benefits
Arvin-Edison Water Storage District				
AEWSD	AEWSD Sunset Spreading Works	Land acquisitions has been completed. To be implemented upon adoptions of AEWSD GSP Chapter and grant funding acquisition.	The Sunset Spreading Works, approximately 150 acres, is located on the boundary between AEWSDand KDWD, adjacent to KDWD's Eastside Canal. The Project will take surface water (Federal CVP,State Water Project, or local supplies) diverted through KDWD's Eastside Canal and recharge thesurface supplies as part of AEWSD's and KDWD's joint water management programs. The Project will include the construction of exterior and interior dikes fo a direct recharge facility, a new turnout and pump station from the KDWD Eastside Canal, and interbasin structures.	Project enhances recharge relevant to groundwater levels, storage, and quality. Prima benefits include water supply augmentation of 2,000-3,000 AFY of recharge and a water demand reduction of 410 AFY.
AEWSD	Private and Caltrans Basin Connections	Not yet initiated. Implementation upon receipt of grant funding.	This project involves the construction of pipelines to connect several on-farm private basins and Caltrans sumps nea AEWSD to utilize for groundwater recharge.	Project enhances recharge relevant to groundwater levels and storage. Primary benefits include water supply augmentation of 50-500 AFY of recharge.
AEWSD	Sycamore Creek Detention & Sedimentation Basin	Not yet initiated. Implementation upon receipt of grant funding.	The proposed basin would serve to intercept sediment from Sycamore creek flows to prevent constriction where sediment deposits downstream, reduce the peak outflow, and prevent the likelihood of a canal and spreading basin breach. Detained water could be recirculated for irrigation demands or recharged for groundwater supply augmentation.	Project enhances recharge relevant to groundwater levels, storage, and quality. Primary benefits include water supply augmentation of 200-300 AFY of stormwater capture.
AEWSD	AEWSD South Canal Flood Study / Improvements	Study to be initiated upon GSP adoption and grant funding acquisition.	The South Canal Flood Study would review and possibly revise the FEMA floodplain in this area in order to increase the height of the canal bank to provide additional operational freeboard and accordingly reduce the potential for canal spills and subsequent flooding.The additional canal storage could allow for the caputure and use of additional floodwater in-lieu of groundwater pumping.	Project enhances recharge relevant to groundwater levels and storage. Primary benefits include water supply augmentation of 100-200 AF of increased storage capacity and stormwater capture.
AEWSD	Stormwater Management and Flood Control Improvements	To be decided upon available funding. Excessive flooding or further damages may expedite intiation.	Potential construction of new sedimentation/detention basins, flood ditch erosion protection, Spillway Basin expansi lengthening the South Canal's siphon under David Road or extension of the South Canal liner through designated floodplain reaches.	Project enhances recharge relevant to groundwater levels, storage, and quality.
AEWSD	On-Farm Recharge	Underway	The program will encourage individual growers to perform on-farm recharge for individual and aggregated benefits. Water may be recharged on-farm in private basins and/or distributed through irrigation systems across irrigated acreage in excess of current crop ET.	Project enhances recharge relevant to groundwater levels and storage.
AEWSD	Caliente Creek Habitat Mitigation and Gorundwater Recharge	Not yet initiated. Implementation upon receipt of grant funding.	Restoration of agricultural lands to native vegetation to provide flood mitigation. Two alternatives are being considered of which Alternative 1 is partial agricultural and 2 is non-agricultural.	Project provides immediate flood control benefits of local stormwater.
AEWSD	AEWSD Intake Canal / KDWD Buena Vista Canal Intertie	Not yet initiated. Implementation to be decided.	Improvement of existing and/or construction of new interties between AEWSD Intake Canal and KDWD's Buena Vis Canal to facilitate water exchanges between the two districts and Kern County partners.	Project to increase surface storage capacity and delivery flexibility in relation to groundwater levels and storage. Primary benefits include water supply augmentation of 8,000 AFY increased transfer and exchange potential.
AEWSD	AEWSD Intake Canal / KDWD Farmer's Canal Intertie	Not yet initiated. Implementation to be decided.	Improvement of existing and/or construction of new interties between AEWSD Intake Canal and KDWD's Farmer's Canal to facilitate water exchanges between the two districts and Kern County partners.	Project to increase surface storage capacity and delivery flexibility. Primary benefits include water supply augmentation of 4,000 AFY increased transfer and exchange potential.
AEWSD	AEWSD Wasteway Basin Improvements	Project to be implemented upon FEMA grant approval.	The primary use of the existing AEWSD Wasteway Basin is to provide emergency water storage in the event of power failure. Additionally, it works as a detention facility for the City of Bakersfield stormwater. This project would include construction of a HDPE liner along the levees, installation of recirculation pumps, and basin grading. These improvements would allow the basin to serve as a location to divert and clarify sediment.	Project to increase surface storage capacity and delivery flexibility in relation to groundwater levels and storage. Primary benefits include water supply augmentation of 1,550 AFY of stormwater capture.

Table 4-1. Kern Groundwater Authority Member Entities List of Projects and Management Actions

Entity	Project Title	Implementation Status	Description	Benefits
AEWSD	Forrest Frick Pipeline / KDWD Eastside Canal Intertie	Not yet initiated. Implementation upon receipt of grant funding.	This project would connect the Forrest Frick Pipeline to the KDWD Eastside Canal to send AEWSD SW supplies through KDWD to serve portions of the AEWSD GWSA with temporary water contracts, utilizing existing infrastructure (turnouts, pipelines that are both District and landowner owned). With the District's new 9(d) contract, certain provisions of Reclamation law are no longer applicable and all lands within the service area can now be served with federal water supplies.	Primary benefits include water supply augmentation of 10 AFY of recharge, 3 AFY/ac of land served.
AEWSD	AEWSD North Canal Balancing Reservoir Expansion & Discharge Pipelines	To be initiated upon completion of feasibilty	The proposed project will consist of the installation of a pipeline system that will convey flows from the four (4) wells within the AEWSD Balancing Reservoir directly to the basin discharge structure and no longer through the basin low flow channels. Infiltration and evaporation losses on well discharge flows will be eliminated and power efficiency for the wells (kwh/af) will be significantly enhanced since all water pumped will be discharged into the North Canal.	Primary benefits include water supply augmentation of 16 AF of increased storage capacity and 100 AFY of recharge. In addition, water demand is expected to be reduced by 50 AFY in evaporative losses.
AEWSD	AEWSD Lateral Capacity Improvement Projects	Not yet initiated.	Increase delivery capacity of the AEWSD N-55 lateral system. Some examples of the actions considered for this project are: replacement of lateral system and landowner pipelines, renovation of storage tanks, construction of pump stations, etc.	Primary benefits include water supply augmentation of 2,000 AFY of of increased delivery capacity.
AEWSD	Conversion of Granite Quarry to Sycamore Reservoir	Study to be initiated upon GSP adoption and grant funding acquisition.	The Granite Co. quarry, located upstream of the Sycamore Spreading Basins, is approaching the end of its operational life and could be converted into a balancing / detention / spreading reservoir. Excess flows in the North Canal could be pumped into the quarry reservoir, so the detained water could be recirculated for irrigation demands in lieu of groundwater pumping and/or recharged.	Primary benefits include water supply augmentation of 3,000-6,000 AFY of recharge and an additional 2,500 AF increased storage capacity.
AEWSD	AEWSD South Canal Balancing Reservoir	Not yet intiated.	Creation of a reservoir to allow water storage for flow mismatches in the AEWSD canal system during operation or emergencies. Depending on the location, this reservoir would increase storage capacity by ~500 AF.	Primary benefits include water supply augmentation of 500 AF increased storage capacity.
AEWSD	Frick Unit In-Lieu Project	Not yet intiated. To be implemented upon grant funding.	This project would increase the ability of the District to provide surface water supplies to the Groundwater Service Area (GWSA) to help meet crop irrigation requirements. With the Project, the District will supply surface water when available through new facilities to the GWSA to meet crop irrigation requirements with the intent of reducing District wide groundwater use.	Primary benefits include water supply augmentation of 3,500 AFY of increased surface water deliveries.
AEWSD	DiGiorgio Unit In-Lieu Project	Completed Phase I. Future phases intiated upon grant funding.	The District will supply SW when available through new facilities to the GWSA to meet its water requirements with the intent of reducing District-wide GW use. However, when SW is in short supply and under agreement, the landowners could recover and return GW from their own wells to the District canal system through new pipelines once they have satisfied their own water needs.	Primary benefits include water supply augmentation of 4,250 AFY in increased surface water deliveries.
AEWSD	General In-Lieu Banking Program	Not yet initiated. To be implemented upon grant funding.	The In-Lieu Banking Program consists of suppling surface water to landowners that previously relied only on groundwater (GWSA). New infrastructure would have to be built to facilitate the implementation of this program.	Primary benefits include water supply augmentation of 2.75 AFY/ac increased surface water deliveries every 2.5 years.
AEWSD	Reclamation of Oilfield Produced Water	To be implemented upon adoptions of AEWSD GSP Chapte and agreement with partnering oil field.	Reclaiming water from oil production facilities for irrigation purposes is currently an untapped water source in AEWSD. After treatment and cooling, produced water could be pumped into AEWSD facilities to serve irrigation demands in-lieu of groundwater pumping.	The primary expected benefit is water supply augmentation.
AEWSD	Wastewater Reclamation with City of Arvin & Bakersfield	To be implemented upon adoptions of AEWSD GSP Chapte and agreement with City of Arvin and City of Bakersfield.	Reclaiming water from Cities of Arvin and Bakersfield wastewater treatment facilities for irrigation purposes is currently an untapped water source in AEWSD. After wastewater treatment, the effluent could be pumped into AEWSD facilities to serve irrigation demands in-lieu of groundwater pumping.	The primary expected benefit is water supply augmentation of 10,000 AFY.
AEWSD	Incentives for Land Conversion	To be implemented upon adoptions of AEWSD GSP Chapter.	The District would provide subsidies to incentivize groundwater users to convert land to alternative land uses (e.g. solar farms) and reduce groundwater extractions. The District may consider a subsidy structure study to determine which subsidies would result in the greatest expected annual benefit in acre-feet per year.	The primary expected benefit is water demand reduction of 2.75 AFY/ac of land converted.
AEWSD	On-farm Water Conservation	To be implemented upon stakeholder interest and acuisition of grant funding.	The NRCS is offering landowner incentive programs to assist in implementing various conservation activities, including but not limited to: irrigation system improvements, water/nutrient/pest management, and pump engine replacement. Interested landowners can call (661) 336-0967 or visit the website (www.ca.nrcs.usda.gov) for more information.	The primary expected benefit is water demand reduction of 50 - 500 AFY.

17.8.1. Evaluation of Benefits

Each of the AEWSD-led P/MAs has expected benefits related to water quantity, and the two ACSD-led projects have expected benefits related to drinking water quality. Once a P/MA is implemented, it is important for there to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. The way in which P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased surface water storage capacity and delivery flexibility, quantification of the benefit will require a comparison of the observed water supply condition (e.g., total imported water) against a hypothetical condition where the P/MA was not in place. For P/MAs that involve water demand reduction the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, quantification of the benefits is inherently uncertain. For the two ACSD-led projects associated with water quality, evaluation of benefits will be done through regular water quality monitoring of ACSD wells, pursuant to its public water system permit.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "glide path"), the goals and objectives of P/MA implementation are not necessarily to achieve a certain water budget outcome, but rather to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

17.8.2. Evaluation Relative to Water Level Sustainability Criteria

As mentioned in **Section 9 *Water Budget Information***, as part of its involvement in the KGA GSA, AEWSD is participating in the development of a numerical groundwater water flow model for the Kern Subbasin based on DWR's California Central Valley Groundwater-Surface Water Simulation beta fine-grid model (C2VSim-FG). As part of this process, all Basin GSAs were asked to input their proposed P/MAs into the Baseline and 2030 Climate Change C2VSim-FG projected model scenarios to assess water level responses to GSP implementation relative to proposed Water Level Sustainability Criteria defined for each GSA/Management Area (see **Sections 14.1** and **15.1**). As demonstrated in **Figure PMA-2**, for each of the sixteen water level Representative Monitoring Sites within the Arvin-Edison Management Area, groundwater elevations are expected to meet their Minimum Thresholds under P/MA implementation in both the Baseline and 2030 Climate Change Scenarios. Water levels are also maintained at or above the Measurable Objectives upon full P/MA implementation. The results of this Basin-wide projected modeling exercise thus further support the notion that the proposed P/MA implementation strategy is expected to result in sustainable management of groundwater levels within the Arvin-Edison Management Area.

17.9. Source and Reliability of Water from Outside AEWSD

☑ 23 CCR § 354.44(b)(6)

Several of the P/MAs discussed below and shown in **Table PMA-1** rely on additional water supplies from outside of the AEWSD area. Specifically, certain P/MAs rely on the availability of water during wet years to fill surface storage, conduct managed recharge, and offset groundwater pumping. As discussed in

Section 9.4 ***Projected Water Budget***, the volume of CVP supplies is anticipated to decrease under the 2030 Climate Change Scenario relative to the Baseline Scenario, and that decrease is the main cause of the projected deficit. However, the FWA projections of Friant-Kern deliveries to AEWSD (FWA, 2018) assume a certain level of demand for Paragraph 16(b) wet year supplies, as described in the following excerpts:

> "This analysis simulates 16(b) delivery via the Friant Kern and Madera canals with an anticipated level of future groundwater infiltration facilities throughout the Friant Division. These facilities were contemplated as a result of SJRRS implementation, and are described by analysis in the SJRRS PEIS/R.
>
> The future management of 16(b) supplies cannot be fully anticipated at this time. Policy for the allocation of supplies has been in a constant state of evolution. For the purposes of this TM, a suggested allocation of 16(b) supplies among Friant Contractors is presented, based on the relative expected reduction in delivery of SJRRS on Class 1 and 2 contract supplies, by contractor."

The FWA (2018) further states:

> "The second SJRRS water category, Paragraph 16(b) supplies, are quantified in the CalSim II model by assuming a demand for this potential supply and meeting this demand, limited by availability of flood water and channel capacity for delivery."

The level of demand within the Arvin-Edison Management Area that is assumed in the CalSim II modeling for the FWA analysis is almost certainly less than the level of demand under the proposed P/MAs discussed herein. Therefore, with additional demand for wet year (Paragraph 16(b)) supplies created by implementation of various P/MAs within the Arvin-Edison Management Area, this analysis assumes that additional Paragraph 16(b) water will be available.

In addition to the apparent underestimation of Friant Kern supplies available to AEWSD described above, AEWSD will continue its efforts to refine modeling results but also continue to secure additional water supplies for importation into the Arvin-Edison Management Area through transfers, exchanges, and purchases, as necessary and possible given pricing and timing constraints.

17.10. Legal Authority Required

☑ **23 CCR § 354.44(b)(7)**

AEWSD and ACSD are Participating Members of the KGA GSA, which is organized as a joint powers authority. AEWSD, as a water storage district, possesses the legal authority to implement the supply augmentation P/MAs discussed herein. ACSD, as a public water system, has the legal authority to implement the drinking water quality projects discussed herein. As a GSA, per CWC § 10725 through 10726.8, the KGA GSA possesses the legal authority necessary to implement the demand management P/MAs described herein, and will either act upon AEWSD's behalf to enforce these P/MAs as necessary or will delegate authority to AEWSD itself to enforce the GSP within the Arvin-Edison Management Area.

17.11. Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in **Table PMA-1**. Given the uncertainty in the scope and timing of these P/MAs, the costs are presented as ranges. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with operations and maintenance (O&M) and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in **Table PMA-1**, and include the following:

- AEWSD funds, generally supported by fees charged to landowners within AEWSD, including potentially the following:
  - General fund
  - SGMA compliance subaccount (to be created)
- Partnering agencies for certain P/MAs (e.g., KDWD, TCWD, Cities of Bakersfield and Arvin, oil field producers)
- Grant funding from sources including DWR, USBR, and the Federal Emergency Management Agency (FEMA)
- ACSD funds, generally supported by local rate payers
- Other

Upon implementation of any given P/MA, the available funding sources for that P/MA will be re-examined.

17.12. Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As stated previously in **Section 9 *Water Budget Information***, under historical conditions (WY 1995 – 2014), and under the Baseline Scenario of the projected water budget, the Arvin-Edison Management Area is in a state of approximate water supply/demand balance (i.e., a small net surplus). It is only under the projected 2030 (and 2070) Climate Change Scenarios that a net water supply deficit is projected to occur. That projected deficit is due, in large part, to a projected reduction in imported water supplies. However, as discussed above, the assumptions used in the FWA modeling analysis (FWA, 2018) regarding demand for Paragraph 16(b) water likely underestimate the demand for such wet year water within AEWSD, and therefore also underestimate Friant-Kern deliveries to AEWSD under the 2030 and 2070 conditions. Many of the projects discussed herein and shown on **Table PMA-1** take advantage of additional wet year supplies that are assumed to be available once demands increase. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects, the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand, and others are more specifically focused on reducing groundwater pumping. These management actions will rely initially on financial incentives (e.g., tiered pricing and/or fees) to drive voluntary demand reduction, but also include setting of mandatory groundwater pumping allocations, if necessary. A groundwater allocation program would likely include mechanisms to allow for trading or exchange of pumping allocations within designated areas, subject to constraints dictated by groundwater conditions observed within the Monitoring Network. Through this combination of increased recharge during wet years and as-needed demand reduction, AEWSD's P/MA efforts will ensure that chronic lowering of groundwater levels and storage during drought will be offset by increases in groundwater levels and storage during other periods.

Appendix D - Letters of Support

1. City of Arvin
2. Kern Delta Water District
3. Kern IRWMP Executive Committee

CITY OF ARVIN

June 23, 2020

Arvin-Edison Water Storage District
P.O. Box 175
Arvin, California 93203

Re: Letter of Support for the Arvin Edison Water Storage District – Forrest Frick Discharge Pipeline / Eastside Canal Intertie Project

To Whom It May Concern,

The City Council of the City of Arvin unanimously voted to support the Arvin-Edison Water Storage District's Forrest Frick Discharge Pipeline / Eastside Canal Intertie Project at its meeting of June 23, 2020.

The City Council of the City of Arvin believes that protection of the groundwater resource is of utmost importance and is aware of the benefits of the programs that AEWSD has operated over the past years. The Forrest Frick Discharge Pipeline / Eastside Canal Intertie Project, together with AEWSD's existing groundwater programs, serves to enhance the groundwater conditions and provide assurance to all groundwater users, including the Arvin Community Services District and to the residents of the City of Arvin, that this important resource will be available in the future.

Sincerely,

Jose Gurrola, Mayor
City of Arvin

Phone (661) 854-3134
Fax (661) 854-0817

200 Campus Drive
P.O. Box 548
Arvin, California 93203

KERN DELTA WATER DISTRICT

501 TAFT HIGHWAY
BAKERSFIELD, CALIFORNIA 93307-6247
TELEPHONE (661) 834-4656
FAX (661) 836-1705

July 24, 2020

Arvin-Edison Water Storage District
Attn: Jeevan Muhar, Engineer-Manager
P. O. Box 175
Arvin, CA 93203

Re: Letter of Support for the Arvin-Edison Water Storage District's Application for the USBR Water SMART Drought Response Program BOR-DO-20-F002

To Whom It May Concern:

This letter offers support for the Arvin-Edison Water Storage District's (AEWSD) application for the WaterSMART Drought Response Program. Kern Delta Water District (KDWD) is working cooperatively with AEWSD on the Forrest Frick Pipeline Eastside Canal Intertie Project (Project) since KDWD's Eastside Canal is involved and would receive water from the Project.

AEWSD and KDWD also share a common boundary in the Eastside Canal. This canal provides for the western boundary of AEWSD and the eastern boundary of KDWD.

The Project will also provide additional flexibility to deliver water to the AEWSD/KDWD jointly operated and owned Sunset Groundwater Recharge Facility, which requires Eastside Canal conveyance and is located about 6 miles downstream of the Project location. In addition, the Eastside Canal could be utilized to deliver water into AEWSD lands that currently rely solely on groundwater to meet agricultural demands.

The Project is an important feature for AEWSD's compliance with California's Sustainable Groundwater Management Act (SGMA) and is a critical drought resiliency project. A project of this nature could reduce the risk of rural wells going dry in this region.

KDWD recognizes the value of water infrastructure projects that provide for increased water management flexibility and water supply reliability in rural communities. This Project aligns with AEWSD's water management goals to achieve long-term sustainability and KDWD is therefore supportive of the Project and AEWSD's application for program funding.

Sincerely,

Steven L. Teglia
General Manager
Kern Delta Water District

KERN IRWMP
Integrated Regional Water Management Plan

July 24, 2020

Arvin-Edison Water Storage District
Attn: Jeevan Muhar, Engineer-Manager
P. O. Box 175
Arvin, CA 93203

Re: Letter of Support for Arvin-Edison Water Storage District's Application for the USBR Water SMART Drought Response Program BOR-DO-20-F002

To Whom It May Concern,

This letter is to offer support for Arvin-Edison Water Storage District's (AEWSD) application for the WaterSMART Drought Response Program. The Forrest Frick Pipeline-Eastside Canal Intertie Project (Project) is a Kern IRWMP project.

The Project would also provide additional flexibility to deliver water to the AEWSD/Kern Delta Water District jointly operated and owned Sunset Groundwater Recharge Facility, which requires Eastside Canal conveyance and is located about 6 miles downstream of the Project location. In addition, the Eastside Canal could be utilized to deliver water into AEWSD lands that currently rely solely on groundwater to meet agricultural demands.

The Project is an important feature for AEWSD's compliance with California's Sustainable Groundwater Management Act (SGMA) and is a critical drought resiliency project. A project of this nature could reduce the risk of rural wells going dry in region.

Kern IRMWP recognizes the value of water infrastructure projects that can increase water management flexibility and water supply reliability in rural communities. This Project aligns with the AEWSD water management goals to achieve long-term sustainability.

Sincerely,

Eric Averett
Co-Chairman

On Behalf of the Kern IRWMP Executive Committee

Appendix E - Official Resolution

BEFORE THE BOARD OF DIRECTORS OF
ARVIN-EDISON WATER STORAGE DISTRICT

IN THE MATTER OF: RESOLUTION NO. 20-18

AUTHORIZING APPLICATION TO THE UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION FOR FISCAL YEAR 2021 DROUGHT RESILIENCY PROJECT FUNDING OPPORTUNITY ANNOUNCEMENT BOR-DO-20-F002

WHEREAS, a grant funding opportunity has been presented by the United States Department of the Interior, Bureau of Reclamation (USBR). The USBR WaterSMART Drought Response Program supports a proactive approach to drought by providing financial assistance to water managers to develop and update comprehensive drought plans and implement projects that will build long-term resilience to drought; and

WHEREAS, the Arvin-Edison Water Storage District (District), a public entity established under the laws of the State of California, hereby authorizes its agent(s) to provide to the USBR all Funding Opportunity Announcement (FOA) BOR-DO-20-F002 (Grant) application materials pertaining to such Drought Response Program and agreements required.

NOW THEREFORE BE IT RESOLVED, by the Board of Directors of Arvin-Edison Water Storage District as follows:

1. That the Deputy General Manager / Assistant Secretary-Treasurer David A. Nixon, and the Engineer-Manager Jeevan Muhar, are hereby authorized to execute for and on behalf of the District this application and to file with the USBR for the purpose of obtaining certain federal financial assistance under Drought Response Program; and

2. The District Board of Directors are in support of the Grant application, and the Engineer-Manager Jeevan Muhar has reviewed the Grant application being submitted.

3. The District is capable of providing matching funds needed to fund the local cost share component in addition to the amount provided by the USBR, should the Grant be awarded to the District; and

4. If selected for the Grant, the District will work with the USBR to meet established deadlines for entering into a cooperative agreement.

ALL THE FOREGOING, being on motion of Martinez, seconded by Lehr, was hereby authorized by the following vote, to wit:

AYES: Directors Camp, Moore, Giumarra, Pascoe, Lehr, Fanucchi, Johnston, Martinez, and Yurosek.

NOES: None

ABSTAIN: None

ABSENT: None

I HEREBY CERTIFY that the foregoing resolution is the resolution of said District as duly passed and adopted by said Board of Directors on the 14th day of July 2020.

WITNESS my hand and official seal of said Board of Directors this 14th day of July 2020.

John C. Moore, Secretary-Treasurer
of the Board of Directors

Appendix F - Budget Supplemental Information

1. AEWSD Fringe Benefits Breakdown
2. Consultant Estimated Staffing Plan and Cost Breakdown
3. Engineer's Opinion of Probable Construction Cost (EOPCC)
4. EOPCC quotes, bid canvasses, and references

Date: 5/9/2020
To: Fernando Ceja
From: D. Nixon
Subject: Wage & Benefits

In accordance with established District policy, the District's Board of Directors has completed a review of employee wages and benefits.

	Present Wage	New Wage	
Hourly Wage:	$31.88		
Monthly Wage:	$5,526.00	$7,000.00	**$40.38**

In addition to the above, the District will provide the following estimated monthly benefits:

Social Security & Medicare contribution at a cost to the District of:	$535.50		
Pension Plan contribution at a cost to the District of:	$840.00		
Life and AD&D Insurance in the amount of $168,000.00 at a cost to the District of:	$49.22		
Long Term Disability at a cost to the District of:	$40.81		
Medical & vision Insurance at a cost to the District of:	$1,285.31		
Dental Insurance contribution at a cost to the District of:	$82.29		
Uniforms at a cost to the District of:	$0.00		
Total Monthly Benefits:		$2,833.13	**$16.34**
Total New Monthly Wage & Benefits:		***$9,833.13***	**$56.73**

Date: 3/1/2020
To: Laird Meadows
From: D. Nixon
Subject: Wage & Benefits

In accordance with established District policy, the District's Board of Directors has completed a review of employee wages and benefits. As a result of this review, the Board by Resolutions No. 20-06, authorized the following wage and benefit adjustments effective March 1, 2020.

	Present Wage	New Wage
Hourly Wage:	$29.51	$30.36
Monthly Wage:	$5,115.00	$5,262.00

In addition to the above, the District will provide the following estimated monthly benefits:

Social Security & Medicare contribution at a cost to the District of:	$402.54		
Pension Plan contribution at a cost to the District of:	$631.44		
Life and AD&D Insurance in the amount of $127,000.00 at a cost to the District of:	$37.21		
Long Term Disability at a cost to the District of:	$30.68		
Medical & vision Insurance at a cost to the District of:	$1,472.07		
Dental Insurance contribution at a cost to the District of:	$118.67		
Uniforms at a cost to the District of:	$0.00		
Total Monthly Benefits:		$2,692.61	**$15.53**
Total New Monthly Wage & Benefits:		***$7,954.61***	**$45.89**

Date: 3/1/2020
To: Micah Clark
From: D. Nixon
Subject: Wage & Benefits

In accordance with established District policy, the District's Board of Directors has completed a review of employee wages and benefits. As a result of this review, the Board by Resolutions No. 20-06, authorized the following wage and benefit adjustments effective March 1, 2020.

	Present Wage	New Wage
Hourly Wage:	$28.11	$28.92
Monthly Wage:	$4,872.00	$5,013.00

In addition to the above, the District will provide the following estimated monthly benefits:

Social Security & Medicare contribution at a cost to the District of:	$383.49		
Pension Plan contribution at a cost to the District of:	$601.56		
Life and AD&D Insurance in the amount of $121,000.00 at a cost to the District of:	$35.45		
Long Term Disability at a cost to the District of:	$29.23		
Medical & vision Insurance at a cost to the District of:	$653.92		
Dental Insurance contribution at a cost to the District of:	$41.14		
Uniforms at a cost to the District of:	$0.00		
Total Monthly Benefits:		$1,744.79	**$10.07**
Total New Monthly Wage & Benefits:		***$6,757.79***	**$38.99**

PROPOSAL FOR ARVIN-EDISON WATER STORAGE DISTRICT
121519003 - Forrest Frick Pipeline East Side Canal Intertie Project
Estimated Staffing Plan and Cost Breakdown

EST. 1988 PROVOST& PRITCHARD CONSULTING GROUP An Employee Owned Company

15%

		Principal Engineer II	Senior Engineer V	Associate Engineer V	Assistant Engineer III	Senior Technician III	Intern	Project Administrator IV	Associate Engineer III	Principal Engineer IV	Senior Const. Manager III	Licensed Surveyor III	Associate Technician III		Mileage	Subconsultant Design	Subtotal Labor	Subtotal Reimb w/Mark Up	Total Fee	
		$195	$178	$145	$106	$143	$65	$98	$128	$215	$160	$155	$117		0.575					
Project Administration																				0%
1	Project Admin.	**1**	**4**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**5**			**$907**	**$0**	**$1,000**	1%
Reporting		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**0**						0%
2	Semi-Annual Progress Reports (2)	**2**	**4**	**2**	**8**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**16**			**$2,240**	**$0**	**$3,000**	2%
3	Final Project Report	**1**	**2**	**1**	**4**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**8**			**$1,120**	**$0**	**$2,000**	2%
Planning and Design		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**0**						0%
4	60% Design Plans (includes Struc. & Elec.)	**4**	**14**	**14**	**24**	**40**	**24**	*0*	**16**	**2**	*0*	*0*	*0*	**138**		*5000*	**$17,604**	**$5,750**	**$24,000**	19%
5	100% Design Plans (includes Struc. & SCADA)	**4**	**10**	**24**	**20**	**32**	**24**	*0*	**8**	**1**	*0*	*0*	*0*	**123**		*20000*	**$15,535**	**$23,000**	**$39,000**	30%
6	Client Meetings/Site Visits	**4**	**10**	**2**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**16**			**$2,850**	**$0**	**$3,000**	2%
7	Design Specifications	**2**	**10**	**6**	**40**	*0*	**8**	**16**	**2**	*0*	*0*	*0*	*0*	**84**			**$9,624**	**$0**	**$10,000**	8%
8	Engineer's Construction Cost Estimate	**1**	**4**	**2**	**8**	**4**	**8**	*0*	*0*	*0*	*0*	*0*	*0*	**27**			**$3,137**	**$0**	**$4,000**	3%
9	Bidding (RFIs, Advertising, Pre-Bid Mtg, etc.)	**2**	**8**	**3**	**8**	**8**	*0*	**8**	*0*	*0*	*0*	*0*	*0*	**37**			**$5,025**	**$0**	**$6,000**	5%
Implementation		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**0**						0%
10	Construction Staking	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	**4**	**8**	**12**			**$1,556**	**$0**	**$2,000**	2%
11	Construction Management	**2**	**8**	*0*	**8**	*0*	*0*	*0*	*0*	*0*	**200**	*0*	*0*	**218**			**$34,662**	**$0**	**$35,000**	27%
																				0%
	Total units	*23*	*74*	*54*	*120*	*84*	*64*	*24*	*26*	*3*	*200*	*4*	*8*	**684**	*0*					
	Total $	***$4,485***	***$13,172***	***$7,830***	***$12,720***	***$12,012***	***$4,160***	***$2,352***	***$3,328***	***$645***	***$32,000***	***$620***	***$936***		***$0***	***$25,000***	**$94,260**	**$28,750**	**$129,000**	

PROVOST & PRITCHARD CONSULTING GROUP
An Employee Owned Company

PRELIMINARY DRAFT
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Arvin-Edison Water Storage District
121519003 - Forrest Frick Pipeline East Side Canal Intertie
August 4, 2020

Item No.	Item Description	Quantity	Unit	Unit Price	Amount
	Overall Site Items				
1	Mobilization/Demobilization, Bonds and Insurance and Permits[3]	1	LS	$ 37,000	$ 37,000
2	Worker and Public Protection[4]	1	LS	$ 15,000	$ 15,000
3	Miscellaneous Facilities and Operations[3]	1	LS	$ 37,000	$ 37,000
				Subtotal	**$ 89,000**
	Manhole Connection and Pipeline Improvements				
4	F&I 84 inch RCP Enclosure and Appurtenances	1	EA	$ 41,375	$ 42,000
5	F&I 30 inch Isolation Valve	1	EA	$ 51,713	$ 52,000
6	F&I 30 inch Steel Pipe w/ AWWA fittings	11	LF	$ 1,750	$ 20,000
7	F&I 4 inch Air and Vacuum Relief Valve	2	EA	$ 525	$ 2,000
8	F&I 30 inch Flow Regulating Control Valve (SCADA-Ready)	1	EA	$ 81,013	$ 82,000
9	F&I 36 inch CMLC Steel Pipe w/ AWWA fittings	37	LF	$ 2,125	$ 79,000
10	F&I Magnetic Flow Meter	1	EA	$ 28,250	$ 29,000
11	F&I 84 inch RCP Enclosure and Appurtenances	1	EA	$ 20,875	$ 21,000
12	F&I 42 inch CMLC Steel Pipe w/ AWWA fittings	67	LF	$ 2,500	$ 168,000
13	F&I 6 inch Steel Protection Posts	6	EA	$ 750	$ 5,000
				Subtotal	**$ 500,000**
	Canal Structure Improvements				
14	Construct Reinforced Concrete Outlet Structure	20	CY	$ 3,125	$ 63,000
15	F&I Access Ladder and Grating	1	EA	$ 34,250	$ 35,000
16	Concrete Lining Replacement	45	CY	$ 625	$ 29,000
17	Canal Rip Rap Improvements	60	CY	$ 125	$ 8,000
18	Export Surplus Soil Material	135	CY	$ 13	$ 2,000
				Subtotal	**$ 137,000**
	Electrical and SCADA Improvements				
19	F&I Electrical Service Pole and Meter	1	EA	$ 12,500	$ 13,000
20	F&I Electrical Conduit, Wires, and Cables	1	EA	$ 25,000	$ 25,000
21	F&I Control Panel and Backboard	1	EA	$ 21,875	$ 22,000
22	F&I Data Logger	1	EA	$ 6,250	$ 7,000
23	F&I Water Level Sensors and Appurtenances	2	EA	$ 6,250	$ 13,000
24	F&I SCADA Telemetry Package	1	EA	$ 25,000	$ 25,000
				Subtotal	**$ 105,000**
				TOTAL:	**$ 831,000**

Notes:
1. This estimate represents the opinion of probable cost based on the engineer's experience with prior projects.
2. Totals rounded up to the nearest one-thousand dollars.
3. Valued at approximately 5% of the onsite construction items.
4. Valued at approximately 2% of the onsite construction items.
5. This estimate is based on preliminary 30% design.
6. F&I = Furnish and Install

R & B COMPANY - BAKERSFIELD
4920 Lisa Marie Ct
BAKERSFIELD, CA 93313
Phone
Fax

Quotation

EXPIRATION DATE	QUOTE NUMBER
04/24/2020	S1928975

R & B COMPANY - BAKERSFIELD
4920 Lisa Marie Ct
BAKERSFIELD, CA 93313
Phone
Fax

PAGE NO.
1 of 1

QUOTE TO:

ARVIN-EDISON WATER STORAGE DISTRICT
20401 BEAR MOUNTAIN BLVD
ARVIN, CA 93203

SHIP TO:

ARVIN-EDISON WATER STORAGE DISTRICT
20401 BEAR MOUNTAIN BLVD
ARVIN, CA 93203

CUSTOMER NUMBER	CUSTOMER PO NUMBER	JOB NAME / RELEASE NUMBER	SALESPERSON
17374	30" ISO VALVE		Jenny Ming

WRITER	SHIP VIA	TERMS	SHIP DATE	FREIGHT ALLOWED
Jenny Ming	BID	Net 30 Days	04/23/2020	No

ORDER QTY	DESCRIPTION	UNIT PRICE	EXT PRICE
1ea	AEWSD FFP EASTSIDE CANAL INTERTIE PROJECT - 30" ISOLATION VALVE 30 FLG AFC 150# SERIES 2500 AWWA C-515 RESILIENT WEDGE GATE VALVE RATED @ 250 PSI DUCTILE IRON CONSTRUCTION NRS BYPASS FLUSHING PORTS SS STEM SS FASTENERS AWWA C-515 *EPOXY* COATING NSF-61 AMERLOK 2 WITH SPUR GEAR OPERATOR & 2" OPERATOR NUT - VERTICAL INSTALLATION,30GV 30AFC 30AFCGV 30FGV 30AFCF 30FAGV Pn: 133276 THIS VALVE WILL BOLT UP TO EXISTING MANHOLE WEEK AND A HALF LEAD TIME ARO	30000.000/ea	30000.00

Price are firm for 30 days. Subject to change without notice after 30 days. Applicable taxes extra.

Subtotal	30000.00
S&H Charges	0.00
Amount Due	30000.00

BID CANVASS

DELANO-EARLIMART IRRIGATION DISTRICT
TURNIPSEED BASIN PHASE 3 EXPANSION PROJECT

PROVOST & PRITCHARD CONSULTING GROUP

Bid Opening Date 2/19/2020 | Project Manager HJS
Prevailing Wages Required YES | Project Engineer DDH

APPARENT LOW BIDDER

Item	Description	Quantity	Unit	ENGINEER'S ESTIMATE		JT2 INC DBA TODD COMPANIES		TEICHERT CONSTRUCTION		FLOYD JOHNSTON CONST.		DAWSON-MAULDIN, LLC		NICHOLAS CONSTRUCTION		WOOD BROS, INC.		CAL VALLEY CONSTRUCTION		GRANITE CONSTRUCTION		SPECIALTY CONSTRUCTION	
				Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total
	BASE BID																						
	GENERAL																						
1	Mobilization/Demobilization, Bonds, Insurance, and Permits	1	LS	$176,000.00	$176,000.00	$167,016.00	$167,016.00	$398,361.00	$398,361.00	$374,500.00	$374,500.00	$350,000.00	$350,000.00	$150,000.00	$150,000.00	$162,760.00	$162,760.00	$450,000.00	$450,000.00	$338,500.00	$338,500.00	$229,300.00	$229,300.00
2	Worker Protection	1	LS	$71,000.00	$71,000.00	$1,635.00	$1,635.00	$29,000.00	$29,000.00	$8,775.00	$8,775.00	$8,000.00	$8,000.00	$10,000.00	$10,000.00	$5,040.00	$5,040.00	$2,500.00	$2,500.00	$25,000.00	$25,000.00	$30,400.00	$30,400.00
3	Miscellaneous Facilities and Operations	1	LS	$176,000.00	$176,000.00	$45,780.00	$45,780.00	$58,000.00	$58,000.00	$21,125.00	$21,125.00	$100,000.00	$100,000.00	$100,000.00	$100,000.00	$40,320.00	$40,320.00	$525,000.00	$525,000.00	$40,000.00	$40,000.00	$19,200.00	$19,200.00
4	Storm Water Pollution Prevention Plan (SWPPP) and Dust Control Implementation	1	LS	$100,000.00	$100,000.00	$32,155.00	$32,155.00	$20,000.00	$20,000.00	$48,500.00	$48,500.00	$12,000.00	$12,000.00	$35,000.00	$35,000.00	$169,680.00	$169,680.00	$7,500.00	$7,500.00	$25,000.00	$25,000.00	$41,000.00	$41,000.00
5	Site Demolition	1	LS	$150,000.00	$150,000.00	$12,000.00	$12,000.00	$27,000.00	$27,000.00	$12,250.00	$12,250.00	$4,000.00	$4,000.00	$10,000.00	$10,000.00	$21,559.00	$21,559.00	$20,000.00	$20,000.00	$75,000.00	$75,000.00	$35,000.00	$35,000.00
	RECHARGE BASINS																						
6	Construct Levee Keyway (F)	12,825	CY	$5.00	$64,125.00	$5.00	$64,125.00	$6.00	$76,950.00	$26.50	$339,862.50	$25.00	$320,625.00	$7.00	$89,775.00	$2.63	$33,729.75	$5.00	$64,125.00	$9.00	$115,425.00	$7.46	$95,674.50
7	Construct Basin Levees (F)	337,400	CY	$5.00	$1,687,000.00	$5.00	$1,687,000.00	$5.65	$1,906,310.00	$4.24	$1,430,576.00	$5.14	$1,734,236.00	$6.90	$2,328,060.00	$5.47	$1,845,578.00	$5.50	$1,855,700.00	$9.00	$3,036,600.00	$8.07	$2,722,818.00
8	Construct Type I Interbasin Structures (100 CFS)	8	EA	$42,250.00	$338,000.00	$60,604.00	$484,832.00	$38,000.00	$304,000.00	$50,000.00	$400,000.00	$51,000.00	$408,000.00	$45,000.00	$360,000.00	$56,000.00	$448,000.00	$51,000.00	$408,000.00	$48,000.00	$384,000.00	$57,000.00	$456,000.00
9	Construct Type II Interbasin Structures (75 CFS)	8	EA	$37,500.00	$300,000.00	$54,336.50	$434,692.00	$36,500.00	$292,000.00	$47,500.00	$380,000.00	$45,000.00	$360,000.00	$47,000.00	$376,000.00	$61,600.00	$492,800.00	$45,000.00	$360,000.00	$45,000.00	$360,000.00	$51,800.00	$414,400.00
10	Construct Stilling Well	2	EA	$10,000.00	$20,000.00	$11,990.00	$23,980.00	$10,000.00	$20,000.00	$6,000.00	$12,000.00	$8,000.00	$16,000.00	$8,000.00	$16,000.00	$8,960.00	$17,920.00	$8,000.00	$16,000.00	$9,000.00	$18,000.00	$11,500.00	$23,000.00
11	F&I Access Gate	3	EA	$5,000.00	$15,000.00	$1,670.00	$5,010.00	$2,250.00	$6,750.00	$2,650.00	$7,950.00	$2,200.00	$6,600.00	$1,500.00	$4,500.00	$4,443.00	$13,329.00	$1,530.00	$4,590.00	$3,000.00	$9,000.00	$1,100.00	$3,300.00
	LATERALS & TURNOUTS																						
12	Construct DEID Lat 115.8W-0.8 Junction Box	1	LS	$100,000.00	$100,000.00	$165,680.00	$165,680.00	$215,000.00	$215,000.00	$225,000.00	$225,000.00	$120,000.00	$120,000.00	$200,000.00	$200,000.00	$237,440.00	$237,440.00	$120,000.00	$120,000.00	$90,000.00	$90,000.00	$388,000.00	$388,000.00
13	Open Trench Road Crossing (F)	21	LF	$1,170.00	$24,570.00	$715.00	$15,015.00	$575.00	$12,075.00	$1,000.00	$21,000.00	$400.00	$8,400.00	$1,400.00	$29,400.00	$1,680.00	$35,280.00	$943.55	$19,814.55	$1,500.00	$31,500.00	$1,100.00	$23,100.00
14	F&I DEID Lat 115.8W-0.8S 54" AWWA C200 CMLC Steel Pipeline	206	LF	$1,600.00	$329,600.00	$2,730.00	$562,380.00	$2,129.00	$438,574.00	$2,560.00	$527,360.00	$2,300.00	$473,800.00	$3,000.00	$618,000.00	$3,472.00	$715,232.00	$2,300.00	$473,800.00	$1,500.00	$309,000.00	$1,975.00	$406,850.00
15	F&I DEID BT11	1	LS	$105,250.00	$105,250.00	$130,800.00	$130,800.00	$185,000.00	$185,000.00	$196,000.00	$196,000.00	$380,000.00	$380,000.00	$260,000.00	$260,000.00	$308,000.00	$308,000.00	$380,000.00	$380,000.00	$120,000.00	$120,000.00	$195,500.00	$195,500.00
16	F&I DEID BT11A	1	LS	$57,150.00	$57,150.00	$87,200.00	$87,200.00	$102,000.00	$102,000.00	$110,000.00	$110,000.00	$190,000.00	$190,000.00	$145,000.00	$145,000.00	$171,360.00	$171,360.00	$190,000.00	$190,000.00	$65,000.00	$65,000.00	$110,000.00	$110,000.00
17	Construct 54" Distribution/Settling Channel Outlet	1	LS	$35,000.00	$35,000.00	$24,000.00	$24,000.00	$85,000.00	$85,000.00	$95,000.00	$95,000.00	$95,000.00	$95,000.00	$110,000.00	$110,000.00	$131,040.00	$131,040.00	$95,000.00	$95,000.00	$35,000.00	$35,000.00	$70,100.00	$70,100.00
18	F&I DEID BT12 Discharge	1	LS	$10,000.00	$10,000.00	$23,000.00	$23,000.00	$25,000.00	$25,000.00	$17,200.00	$17,200.00	$27,000.00	$27,000.00	$29,000.00	$29,000.00	$32,480.00	$32,480.00	$27,000.00	$27,000.00	$30,000.00	$30,000.00	$55,000.00	$55,000.00
19	F&I DEID BT13 Discharge	1	LS	$10,000.00	$10,000.00	$22,000.00	$22,000.00	$22,000.00	$22,000.00	$17,500.00	$17,500.00	$33,000.00	$33,000.00	$29,000.00	$29,000.00	$32,480.00	$32,480.00	$33,000.00	$33,000.00	$32,000.00	$32,000.00	$25,500.00	$25,500.00
20	F&I Chain Link Fence, Man Gate, and Drive Gates	1	LS	$25,000.00	$25,000.00	$9,200.00	$9,200.00	$15,500.00	$15,500.00	$17,250.00	$17,250.00	$14,000.00	$14,000.00	$8,000.00	$8,000.00	$10,080.00	$10,080.00	$8,398.00	$8,398.00	$20,000.00	$20,000.00	$10,500.50	$10,500.50
	TOTAL BASE BID			***Subtotal***	***$ 3,793,695.00***	***Subtotal***	***$ 3,997,500.00***	***Subtotal***	***$ 4,238,520.00***	***Subtotal***	***$ 4,261,848.50***	***Subtotal***	***$ 4,660,661.00***	***Subtotal***	***$ 4,907,735.00***	***Subtotal***	***$ 4,924,107.75***	***Subtotal***	***$ 5,060,427.55***	***Subtotal***	***$ 5,159,025.00***	***Subtotal***	***$ 5,354,643.00***
	ALTERNATIVE BID ITEMS																						
AB1	F&I DEID Lat 115.8W-0.8S 54" AWWA C200 ELC Steel Pipeline	206	LF	-	-	$2,410.00	$496,460.00	$2,250.00	$463,500.00	$2,225.00	$458,350.00	$2,500.00	$515,000.00	$3,500.00	$721,000.00	$3,920.00	$807,520.00	$2,500.00	$515,000.00	$1,850.00	$381,100.00	$2,600.00	$535,600.00
	TOTAL ALTERNATIVE BID AB1			***Subtotal***		***Subtotal***	***$ 3,931,580.00***	***Subtotal***	***$ 4,263,446.00***	***Subtotal***	***$ 4,192,838.50***	***Subtotal***	***$ 4,701,861.00***	***Subtotal***	***$ 5,010,735.00***	***Subtotal***	***$ 5,016,395.75***	***Subtotal***	***$ 5,101,627.55***	***Subtotal***	***$ 5,231,125.00***	***Subtotal***	***$ 5,483,393.00***
AB2	F&I DEID Lat 115.8W-0.8S 54" ASTM C361-C50 RGRCP Pipeline	206	LF	-	-	$2,154.00	$443,724.00	$1,610.00	$331,660.00	$1,470.00	$302,820.00	$1,600.00	$329,600.00	$5,000.00	$1,030,000.00	$5,600.00	$1,153,600.00	$1,600.00	$329,600.00	$1,250.00	$257,500.00	$1,850.00	$381,100.00
	TOTAL ALTERNATIVE BID AB2			***Subtotal***		***Subtotal***	***$ 3,878,844.00***	***Subtotal***	***$ 4,131,606.00***	***Subtotal***	***$ 4,037,308.50***	***Subtotal***	***$ 4,516,461.00***	***Subtotal***	***$ 5,319,735.00***	***Subtotal***	***$ 5,362,475.75***	***Subtotal***	***$ 4,916,227.55***	***Subtotal***	***$ 5,107,525.00***	***Subtotal***	***$ 5,328,893.00***
	Bid Completeness																						
	Section 00 41 43 - Bidder's Proposal					X		X		X		X		X		X		X		X		X	
	Section 00 43 36 - List of Subcontractors					X		X		X		X		X		X		X		X		X	
	Section 00 43 83 - Preliminary Construction Schedule					X		X		X		X		X		X		X		X		X	
	Section 00 43 93 - Bidder's Checklist					X		X		X		X		X		X		X		X		X	
	Section 00 45 13 - Bidder's Qualifications					X		X		X		X		X		X		X		X		X	
	Section 00 45 26 - Workers Compensation Certification					X		X		X		X		X		X		X		X		X	
	Section 00 45 47 - PCC 10162 - Questionnaire on Disqualification					X		X		X		X		X		X		X		X		X	
	Section 00 45 48 - PCC 10232 - Statement on Contempt					X		X		X		X		X		X		X		X		X	
	Section 00 45 51 - Labor and Other Code Requirements Certificate					X		X		X		X		X		X		X		X		X	
	Bid Security					X		X		X		X		X		X		X		X		X	
	(Type)					BID BOND		BID BOND		BID BOND		BID BOND		BID BOND		BID BOND		BID BOND		BID BOND		BID BOND	
	Addendum No 1					X		X		X		X		X		X		X		X		X	
	Addendum No 2					X		X		X		X		X		X		X		X		X	

AV-150 AIR RELIEF VALVE

VALVE SIZE NPT	WT. (LBS.)	PRICE	BOX QTY
1 ½"	1	**28.00** 704800001	10
2"	2	**32.00** 704801000	10
2" Classic Flat Top	2.2	**26.20** 704801005	10
3"	3	**68.00** 704802001	10
4"	6	**132.00** 704804001	6

AV-150 DUAL THREAD VALVE (THREADED BOTH INLET AND OUTLET)

VALVE SIZE NPT	WT. (LBS.)	PRICE	BOX QTY
2"	2	**49.00** 704801010	10
3"	3	**116.00** 704802010	10
4"	6	**173.00** 704804010	6

AV-150 AIR VALVE PARTS

PART	VALVE SIZE 1 ½"	2"	3"	4"
Baffle	N/A	**10.30** 46001048	**13.39** 46003048	**14.42** 46004048
Float Ball	**12.36** 47048150	**15.45** 47048212	**17.51** 47048321	**19.57** 47048400
Seat Seal	**3.09** 43201047	**4.12** 43201049	**6.18** 43203048	**6.18** 43204048

AV-150

SERIES AV-150 ALUMINUM BODY AIR VENT uses a hard, precision ground, inert solid plastic float ball which prevents "sticking" in the closed position. The float ball seats against a precision o-ring providing a tight seal at very low pressures where other vents often leak. Rated to 150 psi on the 1.5" and 2" and 100 psi on the 3" and 4". The aerodynamic "air-flow" design of a high strength alloy aluminum body and full baffle assures maximum vent capacity without premature closing.

AVP-1 PLASTIC AIR RELIEF VALVE

VALVE SIZE	WT. (LBS.)	PRICE
1"	2	**19.00** 704601001
2"	4	**53.00** 704602001
3"	12	**95.68** 704603001

AVP

CR-101 CONTINUOUS ACTING AIR RELIEF VALVE (RATED TO 150 PSI)

VALVE SIZE	WT. (LBS.)	PRICE
2"	15	**208.00** 705802010
3"	16	**234.00** 705803010
4"	22	**294.00** 705804010

SERIES CR-101 ALUMINUM BODY CONTINUOUS ACTING AIR VENT AND VACUUM RELIEF VALVE continually provides high-volume air and vacuum protection, insures full line capacity, and conserves pump horsepower. It seals at pressures as low as 2 psi

CR-101

CR-101 HP CONTINUOUS ACTING AIR VALVE (RATED TO 300 PSI)

VALVE SIZE	WT. (LBS.)	PRICE
2"	16	**499.00** 705802020
3"	17	**699.00** 705803020
4"	23	**899.00** 705804020

NEW PRODUCT

High Pressure Model

CR-101 AIR VALVE PARTS

PART	VALVE SIZE 2"	3"	4"
Base - Cast Iron	**73.13** 40602058	**90.64** 40603058	**117.42** 40604058
Body - Aluminum	**114.33** 40502058	**138.02** 40503058	**175.10** 40504058
Poppet Assembly (Includes Poppet, Guide, and Indicator Knob)	**50.47** 45902058	**55.62** 45903058	**62.83** 45904058
Poppet	**29.87** 45802058	**32.96** 45803058	**36.05** 45804058
Guide	**12.36** 52502312	**12.36** 52502312	**12.36** 52502312
Indicator Knob	**4.12** 51001001	**4.12** 51001001	**4.12** 51001001
Float Cylinder	**57.68** 47002057	**90.64** 47003058	**90.64** 47003058
Baffle	**6.18** 46002058	**10.30** 46003058	**12.36** 46004058
Stud & Nut (ea.)	**4.12** 2519	**4.12** 2519	**4.12** 2519
Body Gasket (O-Ring)	**5.15** 43200001	**5.15** 43505001	**6.18** 43506002

www.dezurik.com

DeZURIK Quotation

To:
USA
Reference:
Invoice Terms: Net 30
Days Valid: 60
Shipping Point:
Delivery Notes:

Date of Quote: 11-25-2019
Quote Number: 167271
Project Name: Provost & Pritchard
I.D. (Rep. Use): Bypass
Line of Business: 4960 - Underground Water Distribution
Make Order To: DeZURIK, Inc.
C/O FRANK OLSEN COMPANY
brent Phillips
286 Rickenbacker circle
Livermore, CA 94551
USA
Phone 9259618888
Email brent.phillips@frankaolsen.com

Currency and Values expressed in USD ($)

ANY PURCHASE ORDER ISSUED AS A RESULT OF THIS QUOTATION IS SUBJECT TO ALL OF THE MANUFACTURER'S CONDITIONS SET FORTH IN THIS DOCUMENT HEREOF, REASONABLE CONTRACT LANGUAGE NEGOTIATIONS AND FINAL ACCEPTANCE BY DEZURIK AT SARTELL, MN USA.

Line #	Cust. Line # Tag #	Qty	Order Code	Unit Price	Total Price
1		1	PEC,30,F1,CI,NBR,NBR,GE-S40SB0*MG-WR4L-HD36 **PEC:** Style - DeZURIK Eccentric Plug Valve, Rectangular Port (AWWA C517) **30:** Size - 30 Inch (750mm); (Standard Port), Stainless Steel Bearings, Welded-In Nickel Seat (Except Stainless Steel Bodies) **F1:** End Connection - Flanged, Drilled to ASME Class 125/150 **CI:** Body Material - Cast Iron, ASTM A126, Class B; (.5"-12" Pressure Rating 175 psi (1210 kPa); (14"& larger Pressure Rating 150 psi (1030 kPa) **NBR:** Packing - .5" - 3" Acrylonitrile-Butadiene Reinforced filler in a PTFE U-ring; 4" & Larger Acrylonitrile-Butadiene Reinforced Multiple V-Ring with External Adjustment, -20 to 180° F. (-29 to 83° C.) **NBR:** Plug Facing - Acrylonitrile-Butadiene; -20 to 180°F (-29 to 83°C) **Coating or Paint:** S40SB0 - 12 mils minimum (non-stainless steel parts) of Blue DeZURIK Epoxy (NSF Std. 61) on Interior and Standard (SP10) surface prep AND 4 mils minimum (non-stainless steel parts) of Blue DeZURIK Epoxy (NSF Std. 61) on Exterior and Standard (SP10) surface prep **GE:** Option - Grit Excluders **MG-WR4L-HD36:** Actuator Type - MG-Series Worm Gear with Handwheel Operator	$46,946.00	$46,946.00
Total					$46,946.00

MANUFACTURER'S CONDITIONS

These conditions apply to all quotations, orders and contracts for DeZURIK, Inc. ("we," "us" or "our")

1. CONSTRUCTION AND LEGAL EFFECT: Our sale to you, as the purchaser of goods from us, is limited to and expressly made conditional on your assent to these typed and printed terms and conditions of sale, the face and reverse side hereof ('These Terms"), all of which form a part of the agreement to sell and which supersede and reject all prior writings (including your order), representations, negotiations with respect hereto and any conflicting terms and conditions of yours, any statement therein to the contrary notwithstanding. The sending of the purchase order for the goods referred to herein, whether or not signed by you, or your acceptance of the goods or payment operates as acceptance by you of These Terms. In case of conflict between These Terms and the terms of your purchase order or acceptance, These Terms govern; any different or conflicting terms submitted by you in any purchase order or acceptance shall be deemed objected to by us and shall be of no effect unless specifically agreed to by us in writing. We will furnish only the quantities and goods specifically listed on the face hereof or the pages attached hereto. We assume no responsibility for other terms or conditions or for furnishing other equipment or material shown in any plans and/or specifications for a project to which the goods quoted or ordered herein pertain or refer. Our published or quoted terms and conditions are subject to change without notice prior to acceptance of order.

2. PRICES: Unless otherwise noted on the face hereof, quotations are valid for 30 days, prices are net, FCA carrier, our factory. Stenographic, clerical, and mathematical errors are subject to correction. Until acceptance of order on These Terms, quoted prices and delivery are subject to change. Thereafter, unless otherwise noted, prices are firm for shipment of goods within 12 months from the relevant quotation date. Our prices are based on current prices for material. We will endeavor to obtain the lowest pricing on materials from our suppliers, but if a significant material price increase occurs between order acceptance and shipment date, goods scheduled to ship beyond 12 months of the quotation date are subject to a price adjustment by the amount necessary to cover such increase.

3. DELIVERY: Dates for the furnishing of services and/or delivery or shipment of goods are approximate only and are subject to change. Quoted lead times are figured from the later of date of acceptance of order on These Terms or from the date of receipt of complete technical data and approved drawings as such may be necessary. We shall not be liable, directly or indirectly, for any delay in or failure to perform caused by carriers or suppliers or delays from labor difficulties, shortages, strikes or stoppages of any sort, failure or delay in obtaining materials, customer requested order changes, fires, floods, storms, accidents, causes designated acts of God or force majeure by any statute or court of law or other causes beyond our reasonable control.

4. SHORTAGE, DAMAGE, ERRORS IN SHIPMENT: Our responsibility ceases upon delivery to carrier. Risk of loss, injury or destruction of property, shall be borne by you from and after our delivery to carrier, and such loss, injury or destruction shall not release you from the obligation to pay the purchase price. You shall note receipt for goods that are not in accordance with bill of lading or express receipt and you shall make claim against such carrier for any shortage, damage or discrepancy in the shipment per the ICC Code for Freight Claims promptly. You shall inspect and examine all items and goods covered by the order when unpacking crated or boxed goods, and if damage is discovered, leave as is until the carrier's agent makes examination and notation on freight or express bill of concealed damage. We will render reasonable assistance to help trace and recover lost goods and collect just claims as a business courtesy, but without obligation. We do not guarantee safe delivery.

5. TAXES: Our prices do not include sales, use, excise, occupation, processing, transportation or other similar taxes which we may be required to pay or collect with respect to any of the materials covered hereby under existing or future law. Consequently, in addition to the price specified herein, such taxes shall be paid by you, or you shall provide us with a tax exemption certificate acceptable to the appropriate taxing authorities. You shall also assume and pay any import or export duties and taxes, with respect to the materials covered by the order, and shall hold harmless and reimburse us therefrom.

6. CREDIT AND PAYMENT: Unless otherwise noted on the face hereof, payment of goods shall be (30) days net in US dollars. Prorated payments shall become due with partial shipments. We reserve the right at any time to suspend credit or to change credit terms provided herein, when, in our sole opinion, your willingness or ability to pay your obligations to us is in doubt. Failure to pay invoices at maturity date, at our election, makes all subsequent invoices immediately due and payable irrespective of terms, and we may withhold all subsequent deliveries until the full account is settled and we shall not, in such event, be liable for non-performance of contract in whole or in part. You agree to pay, without formal notice, 1.5% per month of the amount not paid when due, provided that, if such rate is in excess of applicable governing law, you agree to pay the maximum permitted rate.

7. CANCELLATIONS AND CHANGES: Orders which have been accepted by us are not subject to your cancellation or changes in specifications, except upon our written consent, and we may require, as a condition of such consent, appropriate adjustments in price, delivery schedule and other relevant terms, and in the case of cancellation, cancellation charges. In the event we accept your cancellation, you shall be liable for a cancellation charge equal to the higher of (i) 25% of the purchase price of the item(s), or (ii) any loss or cost incurred by us, including cost of materials, labor, engineering, reconditioning and our profit margin.

8. DEFERRED SHIPMENT: If shipment is deferred at your request, payment of the contract price shall become due when you are notified that the equipment is ready for shipment. If you fail to make payment and/or furnish shipping instructions we may either extend time for so doing or cancel contract. In case of deferred shipment at your request, storage and other reasonable expenses attributable to such delay shall be payable by you.

9. LIMITED WARRANTY: Products, auxiliaries and parts thereof that we manufacture are warranted to the original purchaser for a period of twenty-four (24) months from date of shipment from factory, against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with our recommendations. Repair or replacement, at our option, for items we manufacture will be made free of charge, (FOB) our facility with removal, transportation and installation at your cost, if proved to be defective within such time, and this is your sole remedy with respect to such products. Equipment or parts manufactured by others but furnished by us will be repaired or replaced, but only to the extent provided in and honored by the original manufacturers' warranty, in each case subject to the limitations contained therein. No claim for transportation, labor or special or consequential damages or any other loss, cost or damage shall be allowed. You shall be solely responsible for determining suitability for use and in no event shall we be liable in this respect. We do not guarantee resistance to corrosion, erosion, abrasion or other sources of failure, nor do we guarantee a minimum length of service. Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than us or our authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to install and operate said products and parts according to instructions we furnished, or misuse, modification, abuse or alteration of such product, accident, fire, flood or other Act of God, or failure to pay entire contract price when due shall be a waiver by you of all rights under this warranty. The foregoing guarantee shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to; an actuator is attached to the item by anyone other than our Factory Service personnel. All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous Warranty, and this shall be the only effective guarantee or warranty binding on us, despite anything to the contrary contained in the purchase order or represented by any of our agents or employees, in writing or otherwise, notwithstanding, including but not limited to implied warranties.

THE FOREGOING REPAIR AND REPLACEMENT OBLIGATIONS ARE IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS AND LIABILITIES, INCLUDING ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE OUR ENTIRE AND EXCLUSIVE LIABILITY AND YOUR EXCLUSIVE REMEDY FOR ANY CLAIM IN CONNECTION WITH THE SALE AND FURNISHING OF SERVICES, GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION OR OPERATIONS.

10. INTELLECTUAL PROPERTY. We shall indemnify and hold you harmless from any amount that you are required to pay to a third-party pursuant to final, non-appealable court order as a result of such third-party's claim that a product sold hereunder infringes any United States patent or copyright of such third party; provided that our obligation of indemnification is contingent upon (a) your notifying us of any such claim within 20 days of receipt thereof, (b) your providing us with exclusive control of the defense and/or settlement thereof, and (c) your cooperating with us in such defense and/or settlement. In the event of such a successful infringement claim by the third party, at our option, we shall either (i) modify the product sold hereunder so that it performs comparable functions without infringement, (ii) obtain a royalty-free license for you to continue using the infringing product or (iii) refund to you the then-depreciated fair market value of the infringing component. We shall have no obligation under this Section to the extent a claim is based upon (a) the combination, operation or use of the product with equipment, products, hardware, software, systems or data that was not provided by us, if such infringement would have been avoided in the absence of such combination, operation or use, or (b) your use of the product in any manner inconsistent with our written materials regarding the use of such product. This Section states our entire liability and your exclusive remedy with respect to any alleged infringement arising from the use of the products sold hereunder or any part thereof and is subject to the other limitations contained in These Terms.

11. LIMITATION OF LIABILITY: IN NO EVENT SHALL WE BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND OUR LIABILITY, UNDER NO CIRCUMSTANCES, WILL EXCEED THE CONTRACT PRICE FOR THE GOODS AND/OR SERVICES FOR WHICH LIABILITY IS CLAIMED, ANY ACTION FOR BREACH OF CONTRACT BY YOU, OTHER THAN RIGHTS RESPECTING OUR LIMITED WARRANTY DESCRIBED IN SECTION 9 ABOVE, MUST BE COMMENCED WITHIN THE EARLIER OF 12 MONTHS AFTER THE DATE OF SALE.

12. EXPORT CONTROL COMPLIANCE: You agree and acknowledge that the products are sold in accordance with U.S. export control and sanctions laws, regulations and orders, as they may be amended from time to time. You agree to ascertain and comply with all applicable export and re-export obligations and restrictions, including without limitation, U.S. export and re-export controls under the Export Administration Regulations ("EAR"), International Traffic in Arms Regulations ("ITAR"), and all regulations and orders administered by the U.S. Department of Treasury, Office of Foreign Assets Control (collectively, "U.S. Export Control Laws"). If you are conducting the export from the United States or the re-export from a country outside the United States, you shall comply with such U.S. Export Control Laws and obtain any license or other authorization required to export or re-export the products and related technology. We shall reasonably cooperate and exercise reasonable efforts, at your expense, to support you in obtaining any necessary licenses or authorizations. You shall not export or re-export the products and/or related technology to any country or entity to which such export or re-export is prohibited, including any country or entity under sanction or embargoes administered by the United States. Any diversion contrary to the law of the United States is prohibited. You will not take, and will not solicit us to take, any action that would violate any anti-boycott or any export or import statutes or regulations of the United States or other governmental authorities, and shall defend and indemnify us for any loss or damage arising out of or related to such actions.

13. GENERAL COMPLIANCE WITH LAWS. In addition to your obligations under Section 12 above, you represent and warrant that, in performing your duties under this Agreement, you will comply with, at your sole expense, all applicable laws and regulations of any governmental authority, including your duties involving any required registrations, requirements as to product contents, packaging and labeling, restraint of trade, consumer laws, data privacy and environmental laws. You have had an opportunity to obtain legal advice regarding, and currently comply with, all applicable legal requirements that prohibit unfair, fraudulent or corrupt business practices, including the U.S. Foreign Corrupt Practices Act (FCPA) as well as U.S. and other legal requirements that are designed to combat terrorism and terrorist activities. In addition, neither you nor any of your equity interest owners, officers or directors are named as a "specially designated national' or "blocked person" as designated by the United States Department of the Treasury's Office of Foreign Assets Control under the U.S. PATRIOT Act.

14. INDEMNIFICATION BY YOU. You will indemnify, defend and hold us and our corporate parents and other affiliates and their respective officers, directors, stockholders, members, insurers, attorneys, employees, agents, successors, predecessors, assigns, heirs and personal representatives harmless against any and all liability, claims, suits, actions, losses, liabilities, damages, costs and legal fees arising out of or related to: (i) any conduct of you or any related party as described in Sections 12 or 13 above; or (ii) your breach of any other provision herein.

15. PROPRIETARY INFORMATION: We retain title to all engineering and production prints, drawings, technical data, and other intellectual property, information and documents that relate to the goods and services sold to you. Unless advised by us in writing to the contrary, all such information and documents disclosed or delivered by us to you are to be deemed proprietary to us and shall be used by you solely for the purpose of inspection, installation, and maintenance and not used by you for any other purpose.

16. ARBITRATION: Any controversy or claim arising out of or relating to this Agreement or the breach thereof shall be settled by arbitration administered by the American Arbitration Association in accordance with its Commercial Arbitration Rules, and judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof. The venue for such proceedings shall be St. Cloud, MN.

17. TEXAS WAIVER OF CONSUMER RIGHTS: If you are entitled to its protection, you hereby agree to waive your rights under the Deceptive Trade Practices-Consumer Protection Act, Section 17.41 et seq., Business & Commerce Code, a law that gives consumers special rights and protections. You warrant that, after consultation with an attorney of your own selection, you voluntarily consent to this waiver.

18. APPLICABLE LAW: The rights and duties of the parties shall be governed by the laws of the State of Minnesota.

19. NO OTHER CONTRACT PROVISIONS; OTHER: This is the entire agreement with respect to the products. Terms and conditions of your order shall be without force and effect, except to the extent identical herewith. No dealer, broker, branch manager, agent, employee or representative of ours has any power of authority except to take orders for our products and to submit the same to us, at our factory, for our approval and acceptance on the terms herein or rejection. There are no representations, agreements, obligations, or conditions, expressed or implied, statutory or otherwise, relating to the subject matter hereof, other than herein contained. DeZURIK, Inc. and related terms (we, us and our) shall refer to DeZURIK, Inc. and its affiliates. If any provision hereof is invalid or not enforceable under applicable law, the remaining provisions shall remain in full force and effect. Any assignment of your rights hereunder without our consent (which shall not be unreasonably withheld) shall be void. These Terms shall be binding on your successors and assigns. Our failure to require your performance of any of These Terms shall not serve as a waiver of or diminish our rights to require strict performance of such provision or These Terms.

Line #:	Item Number:	Description:	Qty:	UM:	List Price:	Disc:	Net Price:	Ext. Price:
4.000	UM06-18	18" ULTRA MAG, 150#	1	EA	$7,436.00	23.5%	$5,688.54	$5,688.54
		AC or DC Powered converter Dual 4-20mA Outputs Four programmable digital outputs 25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500') SS316 Electrodes SS Body Carbon Steel Class D Flanges (2) SS Grounding Rings See specification sheet for detailed information Manufacturing lead time is up to 30 working days once ordered.						
5.000	UM06-20	20" ULTRA MAG, 150#	1	EA	$7,674.00	23.5%	$5,870.61	$5,870.61
		AC or DC Powered converter Dual 4-20mA Outputs Four programmable digital outputs 25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500') SS316 Electrodes SS Body Carbon Steel Class D Flanges (2) SS Grounding Rings See specification sheet for detailed information Manufacturing lead time is up to 30 working days once ordered.						
6.000	UM06-24	24" ULTRA MAG, 150#	1	EA	$9,637.00	23.5%	$7,372.31	$7,372.31
		AC or DC Powered converter Dual 4-20mA Outputs Four programmable digital outputs 25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500') SS316 Electrodes SS Body Carbon Steel Class D Flanges (2) SS Grounding Rings See specification sheet for detailed information Manufacturing lead time is up to 30 working days once ordered.						
7.000	UM06-30	30" ULTRA MAG, 150#	1	EA	$14,872.00	23.5%	$11,377.08	$11,377.08
		AC or DC Powered converter Dual 4-20mA Outputs Four programmable digital outputs 25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500') SS316 Electrodes SS Body Carbon Steel Class D Flanges (2) SS Grounding Rings See specification sheet for detailed information Manufacturing lead time is up to 30 working days once ordered.						

McCrometer, Inc. • 3255 West Stetson Avenue, Hemet, CA 92545, USA
Tel (951) 652-6811 • Fax (951) 652-3078 • Website: http://www.mccrometer.com

Line #:	Item Number:	Description:	Qty:	UM:	List Price:	Disc:	Net Price:	Ext. Price:
8.000	UM06-36	36" ULTRA MAG, 150#	1	EA	$19,631.00	23.5%	$15,017.72	$15,017.72

AC or DC Powered converter
Dual 4-20mA Outputs
Four programmable digital outputs
25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500')
SS316 Electrodes
SS Body
Carbon Steel Class D Flanges
(2) SS Grounding Rings
See specification sheet for detailed information
Manufacturing lead time is up to 30 working days once ordered.

9.000	UM06-42	42" ULTRA MAG, 150#	1	EA	$26,770.00	23.5%	$20,479.05	$20,479.05

AC or DC Powered converter
Dual 4-20mA Outputs
Four programmable digital outputs
25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500')
SS316 Electrodes
SS Body
Carbon Steel Class D Flanges
(2) SS Grounding Rings
See specification sheet for detailed information
Manufacturing lead time is up to 30 working days once ordered.

10.000	UM06-48	48" ULTRA MAG, 150#	1	EA	$28,933.00	23.5%	$22,133.75	$22,133.75

AC or DC Powered converter
Dual 4-20mA Outputs
Four programmable digital outputs
25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500')
SS316 Electrodes
SS Body
Carbon Steel Class D Flanges
(2) SS Grounding Rings
See specification sheet for detailed information
Manufacturing lead time is up to 30 working days once ordered.

All Prices are in US Dollars (USD) Total List Quoted: **$132,246.00** Total Net Quoted: **$101,168.19**

This quotation and

by Authorized Representative.

McCROMETER, INC.'S STANDARD TERMS AND CONDITIONS OF SALE FOR PRODUCTS AND SERVICES
REV. 1.4 04/17

SECTION 1: PRODUCT SALES AND FIELD SERVICES

ARTICLE 1: THE CONTRACT

ANY PREPRINTED TERMS AND/OR CONDITIONS ON BUYER'S PURCHASE ORDER OR INVOICE SHALL NOT APPLY AND

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Please note that freight costs are not included in this quote.

Line #:	Item Number:	Description:	Qty:	UM:	List Price:	Disc:	Net Price:	Ext. Price:
1.000	UM06-12	12" ULTRA MAG, 150#	1	EA	$4,920.00	23.5%	$3,763.80	$3,763.80
		AC or DC Powered converter Dual 4-20mA Outputs Four programmable digital outputs 25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500') SS316 Electrodes SS Body Carbon Steel Class D Flanges (2) SS Grounding Rings See specification sheet for detailed information Manufacturing lead time is up to 10 working days once ordered.						
2.000	UM06-14	14" ULTRA MAG, 150#	1	EA	$6,067.00	23.5%	$4,641.26	$4,641.26
		AC or DC Powered converter Dual 4-20mA Outputs Four programmable digital outputs 25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500') SS316 Electrodes SS Body Carbon Steel Class D Flanges (2) SS Grounding Rings See specification sheet for detailed information Manufacturing lead time is up to 30 working days once ordered.						
3.000	UM06-16	16" ULTRA MAG, 150#	1	EA	$6,306.00	23.5%	$4,824.09	$4,824.09
		AC or DC Powered converter Dual 4-20mA Outputs Four programmable digital outputs 25' Remote Mount cable, or directly-mounted converter (Additional cable is $3.28/ft up to 500') SS316 Electrodes SS Body Carbon Steel Class D Flanges (2) SS Grounding Rings See specification sheet for detailed information Manufacturing lead time is up to 30 working days once ordered.						

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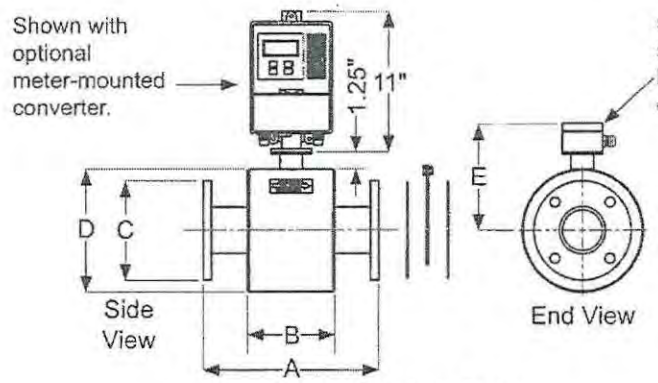
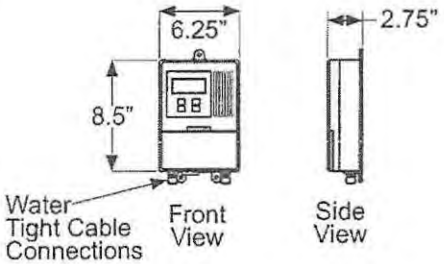
ULTRA MAG

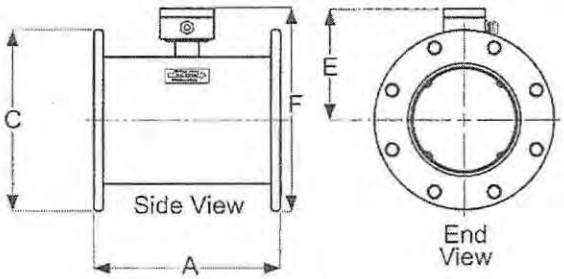
MODEL UM06 AND UM08
ELECTROMAGNETIC FLOW METER



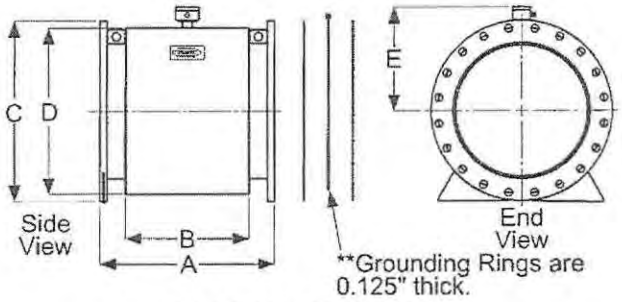
2" and 3" Models Body Style



Converter Dimensions



4" to 12" Models Body Style



14+" Models Body Style

METER & PIPE SIZE/ (METER ID)	FLOW RANGES, GPM STANDARD .2 TO 49 FPS MIN. - MAX.	DIMENSIONS								ESTIMATED SHIPPING WEIGHT POUNDS	
		A* UM06	A* UM08	B	C UM06	C UM08	D	E	F UM06 / UM08	UM06	UM08
2 (2 5/32)	2 - 480	11.0	11.0	6.7	6	6.5	7.9	7.95	10.95 / 11.45	55	60
3 (3 1/4)	5 - 1,080	13.4	13.4	6.7	7.5	8.25	9.4	8.7	12.45 / 12.83	90	105
4 (3 3/4)	8 - 1,920	13.4	13.4	n/a	9	10	n/a	6.75	11.25 / 11.75	55	100
6 (5 3/4)	19 - 4,320	14.6	14.6	n/a	11	12.5	n/a	7.75	13.25 / 14.00	65	115
8 (7 3/8)	33 - 7,680	16.1	17.25	n/a	13.5	15	n/a	8.75	15.50 / 16.25	85	130
10 (9 3/4)	52 - 12,000	18.5	18.5	n/a	16	17.5	n/a	9.15	17.15 / 17.90	110	175
12 (11 3/4)	74 - 17,300	19.7	19.7	n/a	19	20.5	n/a	11	20.50 / 21.25	150	210
14 (13 5/8)	90 - 23,500	21.7	22.75	12.0	21	23	20.3	14.15	24.65 / 25.65	401	480
16 (15 5/8)	118 - 30,700	23.6	25.25	14.2	23.5	25.5	21.1	14.9	26.65 / 27.65	448	500
18 (17 5/8)	150 - 39,000	23.6	25.25	14.2	25	28	21.1	15.9	28.40 / 29.90	550	600
20 (19 9/16)	185 - 48,000	25.6	28.25	16.2	27.5	30.5	24.8	16.95	30.70 / 32.20	588	725
24 (23 1/2)	270 - 69,000	30.7	35.75	21.7	32	36	29.6	18.8	34.80 / 36.80	815	1,430
30 (19 1/4)	420 - 108,000	35.8	41.75	26.5	38.75	43	35.9	21.95	41.33 / 43.45	1,330	2,290
36 (35 1/4)	610 - 156,000	46.1	46.1	28.2	46	50	42.7	25.35	48.35 / 50.35	1,450	2,915
42 (41 1/4)	830 - 212,000	48.05	***	32.1	52.75	***	48.35	28.68	55.05 / ***	***	***
48 (47 1/4)	1,080 - 277,000	50	***	36	59.5	***	54	32	61.75 / ***	***	***

$3,763.80
4,641.26
4,824.09
5,688.54
5,870.61
7,372.31
11,377.08
15,017.72
20,479.05
22,133.75

* Laying lengths for meters with ANSI Class 150 Flanges are equal to UM08 laying lengths.
** Required for 2", 3" and 14+" models only.
*** Consult Factory

McCROMETER
www.mccrometer.com
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EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

BID CANVASS

ARVIN-EDISON WATER STORAGE DISTRICT

SYCAMORE CHECK IMPROVEMENT PROJECT

Bid Opening Date 04/24/2018 Project Manager RH

Prevailing Wages Required YES Project Engineer RH

				ENGINEER'S ESTIMATE		APPARENT LOW BIDDER W.M. Lyles Co.		Bosco Constructors, Inc.	
Item	*Description*	*Quantity*	*Unit*	*Unit Cost*	*Total*	*Unit Cost*	*Total*	*Unit Cost*	*Total*
	Base Bid								
1	Mobilization/Demobilization, Bonds, and Insurance	1	LS	$94,000.00	$94,000.00	$106,000.00	$106,000.00	$191,190.00	$191,190.00
2	Miscellaneous Facilities, Operations, and Worker Protection	1	LS	$94,000.00	$94,000.00	$1,060.00	$1,060.00	$42,696.00	$42,696.00
3	Implement DCP & SWPPP	1	LS	$30,000.00	$30,000.00	$25,440.00	$25,440.00	$52,936.00	$52,936.00
4	Remove Existing Concrete Liner	4,500	SF	$3.50	$15,750.00	$3.00	$13,500.00	$4.00	$18,000.00
5	Site Preperation / Clearing & Grubbing	1	LS	$26,000.00	$26,000.00	$40,400.00	$40,400.00	$28,944.00	$28,944.00
6	Construct Check Structure	1	LS	$300,000.00	$300,000.00	$550,730.00	$550,730.00	$587,198.00	$587,198.00
7	Furnish and Install Langemann Gates	1	LS	$225,000.00	$225,000.00	$212,410.00	$212,410.00	$237,350.00	$237,350.00
8	Canal Overexcavation and Recompaction STA 579+00 to STA 668+40 (F)	10,000	CY	$28.00	$280,000.00	$54.90	$549,000.00	$35.00	$350,000.00
9	Canal Rough & Finish Grading STA 579+00 to STA 668+40 (F)	4,000	CY	$21.50	$86,000.00	$32.00	$128,000.00	$149.00	$596,000.00
10	Construct Concrete Canal Liner	1,600	SF	$7.70	$12,320.00	$11.40	$18,240.00	$26.00	$41,600.00
11	Construct Concrete Canal Liner Extension STA 579+00 to STA 668+40	60,000	SF	$6.00	$360,000.00	$9.80	$588,000.00	$24.00	$1,440,000.00
12	Modify Well Discharges	10	EA	$8,000.00	$80,000.00	$8,260.00	$82,600.00	$4,838.00	$48,380.00
13	Modify Well Discharge Structures	5	EA	$5,200.00	$26,000.00	$8,780.00	$43,900.00	$10,680.00	$53,400.00
14	Modify Turnouts	6	EA	$15,000.00	$90,000.00	$13,950.00	$83,700.00	$12,500.00	$75,000.00
15	Modify Drainage at Bear Mountain Blvd.	1	LS	$41,000.00	$41,000.00	$74,250.00	$74,250.00	$35,000.00	$35,000.00
16	Site Electrical and Controls	1	LS	$190,000.00	$190,000.00	$77,700.00	$77,700.00	$195,750.00	$195,750.00
	TOTAL BASE BID			***Subtotal***	***$ 1,950,070.00***	***Subtotal***	***$ 2,594,930.00***	***Subtotal***	***$ 3,993,444.00***
	Additive Bid Items								
17	Demolish Existing Check Structure	1	LS	$77,000.00	$77,000.00	$52,290.00	$52,290.00	$78,000.00	$78,000.00
18	Construct Concrete Liner at Check Structure	5,000	SF	$7.70	$38,500.00	$18.30	$91,500.00	$9.00	$45,000.00
19	Remove Temporary Bypass	1	LS	$29,000.00	$29,000.00	$60,805.00	$60,805.00	$97,500.00	$97,500.00
20	Construct Concrete Liner at Bypass	5,600	SF	$7.70	$43,120.00	$18.60	$104,160.00	$9.00	$50,400.00
21	Well Discharge Structure Bypass	5	EA	$25,000.00	$125,000.00	$50,600.00	$253,000.00	$21,000.00	$105,000.00
22	Furnish Stop Logs	2	EA	$40,000.00	$80,000.00	$37,150.00	$74,300.00	$77,500.00	$155,000.00
23	Canal Overexcavation and Recompaction STA 576+58 (Start) to 579+00 and STA 668+40 to 678+43 (End) (F)	1,400	CY	$28.00	$39,200.00	$63.20	$88,480.00	$93.00	$130,200.00
24	Canal Rough & Finish Grading STA 576+58 (Start) to 579+00 and STA 668+40 to 678+43 (End) (F)	600	CY	$21.50	$12,900.00	$40.00	$24,000.00	$130.00	$78,000.00
25	Construct Concrete Canal Liner Extension STA 576+58 (Start) to 579+00 and STA 668+40 to 678+43 (End)	3,000	SF	$6.00	$18,000.00	$10.30	$30,900.00	$16.00	$48,000.00
	TOTAL ADDITIVE BID			***Subtotal***	***$ 462,720.00***	***Subtotal***	***$ 779,435.00***	***Subtotal***	***$ 787,100.00***
	TOTAL BASE AND ADDITIVE BID			***Total***	***$ 2,412,790.00***	***Total***	***$ 3,374,365.00***	***Total***	***$ 4,780,544.00***

Bid Completeness		
Section 00 41 43 - Bidder's Proposal	X	X
Section 00 43 36 - List of Subcontractors	X	X
Section 00 43 83 - Preliminary Construction Schedule	X	X
Section 00 43 93 - Bidder's Checklist	X	X
Section 00 45 13 - Qualification Statement	X	X
Section 00 45 16 - Non-Collusion Affidavit	X	X
Section 00 45 26 - Workers Compensation Certification	X	X
Section 00 45 47 - PCC 10162 - Questionnaire on Disqualification	X	X
Section 00 45 48 - PCC 10232 - Statement on Contempt	X	X
Section 00 45 51 - Labor and Other Code Requirements Certificate	X	X
Executed Addendum No. 1	X	X
Executed Addendum No. 2	X	X
Bid Security	X	X
(Type)	**BID BOND**	**BID BOND**
DBE Good Faith Effort Documentation	**4/26/2018**	**Received w/ Bid**

Stage Discharge Recorder (SDR)

Overview

Sutron fused our ultra-reliable SDI-12 optical encoder with our state-of-the-art SatLink2 Logger technology to create an encoder that never forgets.

Features

- Dual Sensor: Setup SDR to measure a second stage using an analog* or SDI-12 sensor
- Rating Table: Compute discharge using a rating table with up to 50 points
- Averaging: Stage can be computed by averaging multiple samples over a user-set period
- 4-20mA output:* Output stage or discharge using the 4-20mA circuit (*requires SDR w/analog: SDR-0001-4)
- With proven float-tape-counterweight technology, it's a "plug compatible" replacement for a Stevens strip chart or punched-tape recorder.
- Saves your data in ultra-reliable Flash Memory
- No back-up batteries and you never lose your data
- Incorporates standard flume and weir equations
- Computes and logs discharge totals
- Displays discharge as well as flume/weir stage
- Built-in event log tracks events such as data views, data downloads, and setup changes
- Runs up to 1 year on an industrial alkaline battery
- Data delivered in easy-to-read & -open CSV files
- All setup can be done from front panel
- Download utilities available for Pocket PC-compatible PDAs & Windows laptops
- SD Card Option

Sutron Recommends

1. Stilling well with minimum 8" diameter
2. 5/16" shaft float wheel/pulley with circumference of 12", 18", & 375mm. If the float wheel does not have an insulating hub, a PVC float must be used. (See Ordering Options)
3. Beaded wire/tape compatible with the float wheel.
4. Float/counterweights.
5. 12-volt alkaline battery with capacity of at least 20 amp-hrs. (See Ordering Accessories).

Stage Discharge Recorder Model SDR-0001-1

Displays

- Stage - Daily & Log
- Volume So Far Today
- Flow
- Discharge
- Review Discharge by Day

Applications & Benefits

- SDR is a Logging Shaft Encoder used in surface water & groundwater applications.
- Front panel programmable, it holds over one year of data, & operates for over one year on alkaline batteries.
- An SDR model is available with an SD Card Slot for log retrieval.
- SDR works with low-cost cellular data modems & Sutron's Autopoll Desktop Software to create an automatically-polled, IP-based data collection system.
- SDRs are also SDI-12 sensors.
- SDR works for sites with or without stilling wells
- Ground Water Monitoring
- Records Discharge on Canals, Ditches, Turnouts, etc.
- Runs all year on 2 lantern batteries
- Log file does not erase.
- Simply enter flume/weir formula
- 2 years of data storage

Stage Discharge Recorder Analog Model (SDR Analog) SDR-0001-3

Applications

- 0-5 V Sensors
- Low-Level Bridge Output Sensors
- 4 to 20 mA Sensors
- SDR analog sensor input version works with ultrasonics, submersibles & other sensors.
- A switched 24-volt power supply provides everything needed to operate 4 to 20mA loop sensors.

Features

- Extremely Accurate, Low-Noise Analog Measurement System
- Removable terminal strip(s)
- 0-5 V Single Ended Analog Input
- 0 to (+/-)39 mV Differential Analog Input (for Bridge Type Pressure Sensors)
- 4-20 mA Input
- 2.5 V Precision Reference Voltage
- Switched Battery Output to power sensors and conserve battery power when not performing measurements
- 24 V Output to power 4-20 mA current loop sensors

SDR ANALOG SPECIFICATIONS *Specifications subject to change without notice*	
Operating Voltage	8-16 Volts
Operating Temperature Range	-40° C to +60° C
Volt Reference	2.5 volt reference, +/- 10 mv, 19 mA max
Reference Temperature Coefficient	10 ppm/° C max
A/D Number of Bits	24
Switched Battery	Short Protected
SINGLE ENDED INPUTS	**2 CHANNELS***
Full Scale	0 to 5 Volts
Resolution	0.298 uV
Noise (p/p) @25° C	6.5 uV (p/p)
Noise (rms) @25 ° C	3.4 uV RMS
Accuracy @25° C	0.02% FS
Input Impedance	>2M Ohm
DIFFERENTIAL INPUTS	**3 CHANNELS***
Full Scale	+/- 0.0390625 V
Resolution	4.657 nV
Noise (p/p) @25° C	1.6 uV (p/p)
Noise (rms) @25° C	0.38 uV
Accuracy @25° C	<.01% ratiometric
Input Impedance	>3M Ohm
4-20mA INPUT	**1 CHANNEL***
Full Scale	20mA
Resolution	<1mA
Accuracy @25° C	.02% FS
24 Volt Current Loop Pwr	24 Volt +/- 5%, short protected

NOTE: Software supports only 2 total measurements: Stage & Additional Sensor. Other channels are for future use.

SPECIFICATIONS

Specifications subject to change without notice

Measurements	Stage/Level measurements, Internal Temp, Battery. Note: a second stage can be measured via SDI-12 or via optional analog interface.
Automeasure Interval	15-minute default, 1, 5, & 10 minutes user selectable. 30 & 60 minute intervals also available.
Stage/Level Resolution	Shaft encoder has 400 count/revolution. SDR-0001-3 supports analog input in place of the encoder. The analog input can measure a 0-5V sensor, 4-20ma sensor or resistive bridge sensor.
Shaft	5/16" diameter
Supported Wheels	1ft, 00.375 meter, 0.5 meter and custom
Stage/Level Range	+/-80 ft of calibration point
Calculations	Discharge using Parshall Flume, Broad Crested Weir equations, Dual Sensor, Rating Table or general purpose equation with user entered constants. Calculation of daily volume and daily average stage.
Recording intervals	15-minute default, 1, 5, & 10 minutes user selectable. 30 & 60 minute intervals also available.
Available data	Station name, date/time, current stage, current discharge, current total, battery voltage & logged values of the stage & discharge, daily average stage, average discharge & total discharge.
Enclosure	NEMA 3, IP63 resists dripping water & spray
Comm. Ports	SDI-12, RS232
Operating Temp	-40°C to +60°C
Display Type	2x20 LCD with backlight
Keypad Type	6 button
Memory	
Built-In Flash	>300,000 readings
SD	yes
USB	no
Ethernet	no
Clock Accuracy (at 0°C – 40°C)	2 minutes per month, optional RS232 GPS sync
Power Requirements	5.5 to 16 VDC
Current Drain	<3.5mA @12 VDC
Communication Protocols	MODBUS Slave. SCP, SDI-12
Programming	via front panel or SDR communicator program
Log capacity	Over one (1) year of 15-minute stage data with accompanying daily average of discharge and midnight battery voltage
Log wrapping	PERMANENT LOG wraps when full (oldest data replaced by newest data). There is NO mechanism to erase the log.
Data downloads	Compatible with Pocket PC , PDA or laptop/desktop Windows PC
Event log	Any stage or setup changes written to the event log.
Download time	Less than 6 minutes, even for a 6-month log
Download	Comma-separated variable (CSV)
Graphing data	PDA and laptop utilities provide data graphing
Status lights	2 on front panel show "heartbeat" & run/error status

Device Dimensions	
Height	4.5" (11.5 cm)
Length	4" (10.2 cm)
Width	7" (17.8 cm)

ORDERING

SDR-0001-1	Stage Discharge Recorder, Standard Unit, with shaft encoder only. Battery cable included.
SDR-0001-1SD	SDR-0001-1 with SD Card
SDR-0001-3	SDR w/Analog Input & 4-20mA outputs The Analog Stage Discharge Recorder does not include a shaft encoder. Order separately.
SDR-0001-3SD	SDR-0001-3 with SD Card
SDR-0001-4	SDR w/Analog Input, 4-20mA outputs,. Includes a shaft encoder
SDR-0001-4SD	SDR-0001-4 with SD Card
ACCESSORIES	
5100-0040	Battery, 12VDC, 24 AH, sealed, rechargeable lead-acid
5100-0530-2	Float, 6" PVC
5100-0118-1	Float Wheel, 375mm/revolution for beaded cable and 5/16" shaft
5100-0581	Chain, Beaded, 12.5cm, 1 Meter Length Increments
5100-0550	Counterweight, 8 oz.
6661-1213	2 GB SD Card

SHIPPING

Shipping Height	14 in. (35.6 cm)
Shipping Length	10 in. (25.4 cm)
Shipping Width	6 in. (15.3 cm)
Shipping Weight	5 lbs. (2.3 Kg)

Batteries not Included: Use lead acid or alkaline batteries providing 12 volts or use two 6 volt lantern batteries (Eveready 528 or 529) connected in series. In most applications this will provide 12 months of operation.



MODEL H-3123

SUBMERSIBLE PRESSURE TRANSDUCER

The **H-3123** is a Submersible Pressure Transducer used to accurately measure water level/pressure. Transmit data digitally over long cable lengths of up to 304.8 meters (1000 feet).

APPLICATIONS

Accurately measure ground and surface water pressure, temperature, and levels in storm water stations, stream gauge sites, waste water facilities, aquifer monitoring, and hydrometeorological systems.

H-3123

KEY FEATURES

- Accuracy over temperature range <= 0.02% FS. For our 15 psi range this exceeds 3mm (±0.01 ft) of water
- Stainless steel sensor diaphragm, ballast, and casting
- SDI-12 Output
- Polyurethane vented sensor cable is durable and rugged
- Dry air moisture barrier system provides atmospheric compensation
- No on-site calibration required

YSI

a xylem brand

SPECIFICATIONS

PERFORMANCE			
Accuracy	Pressure	Less than or equal to 0.02% of full scale output (FSO) over temperature range	
	Long-term Stability	Drift is less than ± 0.10% of FSO per year	
Resolution	Pressure	1 part in 1,000,000 (0.0001%)	
	Temperature	1 part in 1,000,000 (0.0001%)	
Range	PSI ranges: 15, 30, 50 or 100		
	Pressure	Depth	Accuracy
	0 to 103.4 kPa (15 psi)	0 to 10.54 m (34.6 ft)	±2 mm (0.007 ft)
	0 to 206.8 kPa (30 psi)	0 to 21 m (69.2 ft)	±4 mm (0.01 ft)
	0 to 344.7 kPa (50 psi)	0 to 35.16 m (115.35 ft)	±7 mm (0.02 ft)
	0 to 689.5 kPa (100 psi)	0 to 70.3 m (230.7 ft)	±14 mm (0.05 ft)
General	Pressure Overload	Less than 2 times the rated pressure	
	Media Compatibility	Liquids and gases compatible with stainless steel and polyurethane.	
	Dry Air System	Prevents moisture from condensing in the submersible pressure transducer. Provides compensation for changes in atmospheric pressure without impairing the sensor's accuracy.	
MECHANICAL / POWER			
Size	Housing	22.2 mm max W x 165 mm L (0.875 in max W x 6.5 in L)	
Material	Material	316 L stainless steel with polyurethane vent tubing	
Power Requirements	Voltage Input	9.6 to 16.0 volts DC	
	Current	Standby: 1 mA maximum	
		Active: 15 mA maximum	
Connector	Cables	3.048 m (10 ft) Cable (H-3123 to junction box): Polyurethane jacket, vented, shielded, three-wire cable. *Stainless steel cable not necessary. UV vented cable sold separately.	
General	Cable Length	Maximum: 304.8 m (1000 ft)	
	Protection	On-board transient surge protection 1.5KVA	
COMMUNICATION			
SDI-12	Baud Rate	1200	
	Protocol	SDI-12, V1.3	
	Response Time	4-second measurement sequence	

ENVIRONMENTAL		
General	Operating Temperature	0° to 40° C (non-freezing)
	Compensated Temperature	0° to 40° C
	Storage Temperatures	-10° to 75° C
MISCELLANEOUS		
Accessories	H-3123-DAA	Dry Air Assembly
	H-3123-MB	Media Barriers
	H-3123-VC	Vented Cable (price per foot)
	H-3123-H	Vented Cable Mesh Grip Hanger
	H-306	Dry Air System Desiccant Pack (10/pack)
Warranty	The WaterLOG® H-3123 is warranted against defects in materials and workmanship for one year from date of shipment.	
Note	Specifications subject to change without prior notice due to ongoing commitment to product testing and improvement. LR May, 2016. (D06-06 0516)	

xylem
Let's Solve Water

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