Juniper Riviera County Water District Implementation Plan

Backup Generator Funding Program

March 2023

Prepared by:
California Rural Water Association

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1.0 BACKGROUND INFORMATION

Juniper Riviera County Water District (JRCWD) is located in San Bernardino County, California, approximately four miles southeast of the town of Apple Valley. It is a remote location in the foothills of the San Bernardino mountains. The system applied for the Backup Generator Funding Program administered by the California State Water Resources Control Board (SWRCB). The application was reviewed by the Division of Drinking Water (DDW) and approved by the Division of Financial Assistance (DFA). This Implementation Plan falls under Section 3.3 of California Rural Water Association's agreed upon Scope of Work for the Program.

1.1 Water System Details

JRCWD serves a population of at least 850 residents through 280 service connections. Well 1 is the main producer for JRCWD with a production capacity of 106 gallons per minute (gpm) and can supply enough water to meet the Maximum Daily Demand (MDD) of the system. Well 2 (75 gpm) is used intermittently and Well 3, only during emergencies. There is continuous chlorination at each of the wells. The water is stored in three storage tanks with capacities of 50,000, 50,000 and 75,000 gallons, located at various elevations throughout the distribution system. The two lower tanks, Tanks 1 and 2, have two booster pumps each to pump water to the next tank higher in elevation. Booster Pumps 1 and 2 (BP 1/BP 2) are located at Tank 1 and used to pump water into the distribution system directly as well as to Tank 2. Similarly, BP 3/BP 4 pump water from Tank 2 to Tank 3. Both sets of booster pumps currently operate in Duty/Standby mode.

The well and booster pumps are operated in AUTO mode controlled by the SCADA system based on the water levels in the tanks.

With recent increase in water demand, the system is currently in the design phase of an upgrade project to construct two new tanks at the same sites as Tanks 2 and 3, and a new source well. Following the upgrades, the system anticipates using both sets of booster pumps simultaneously to feed the tanks. The new generators being installed will be sized to accommodate this anticipated increase in load.

JRCWD classifies as a Priority 2 for the generator program. Neither the wells nor the booster pumps stations have any auxiliary power. Although the system has sufficient storage, with the increased likelihood of a public safety power shutoff (PSPS) in the past two years due to wildfire risks, the ability to maintain continuous and sufficient water supply during power outages is at risk.

2.0 GENERATOR INFORMATION

The system requires four generators - three stationary and one portable. Stationary generators will provide backup power for Well 1 and the booster pumps at two of the tank sites. The portable generator will be moved to Wells 2/3 to power the well pumps if needed or used to power the SCADA system at the District Office so the overall operation of the system can be monitored during an outage. The specifications of each generator will be determined during the design phase. An assessment of the generator size and voltage requirements are presented in Table 1.

JRCWD has one vehicle available that can transport the portable generator to the various sites as needed.

Table 1: System Facilities Requiring Backup Power

#	Equipment	Motor Size	Proposed Gen. Size	Phase/ Voltage	Type	Fuel
1	Well 1	30 hp	80 kW	3-Phase/ 480 V	Stationary	Diesel
2	Wells 2, 3; District Office[1]	20 hp	100 kW	Dual Rated-480V, 3 phase and 120/240V, 1 phase	Portable	Diesel
3	BP 1/BP 2	25 hp	125 kW	3-Phase/ 480 V	Stationary	Diesel
4	BP 3/BP 4	25 hp	125 kW	3-Phase/ 480 V	Stationary	Diesel

[1] Generator could be used at any of these three sites as needed

2.1 Clean Energy Options

Due to the remote location of JRCWD, natural gas and propane generators are not a feasible option. A solar energy system is not feasible for JRCWD as the size of the pumps are too large. A majority of the solar generation systems which are prepackaged in a trailer or shipping container supply a limited amount of power, typically less than 15 kW. These systems also typically only provide single phase power which would not meet the needs of JRCWD. A larger solar generation system such as a microgrid could potentially produce enough power for JRCWD However, these systems need a large area, up to one acre, and are significantly more expensive than a diesel fuel generator.

Therefore, diesel is the most feasible and economical option for generator fuel at JRCWD.

2.2 Generator Availability

Availability of generators varies greatly due to the current global supply chain issues. Multiple vendors were contacted for estimated lead times for various sizes. As of February 2023, generators 100 kW and under are expected to have a lead time of 9-12 months. Generators between 100-200 kW are expected to have a lead time of 9-12 months. Portable generators over 100 kW are expected to have a lead time of approximately 16-18 months. These are only estimates and may change. Availability will be determined once generator sizes have been finalized.

2.3 Operation Parameters

Following a site visit to JRCWD in January 2023 by an electrical engineer and CRWA staff, the following plan and parameters were developed for efficient system operation.

The following will be provided at each generator site:

1. The generators will be located outside in weather-proof enclosures. The existing fence at the well sites will be moved to make room for a concrete pad for the generator and fuel tank. The fence enclosures at the tank sites will not need to be moved as there is sufficient space surrounding the tanks.
2. Chlorination pumps (at all well sites) will be turned on simultaneously with the well pumps.
3. Automatic Transfer Switches (ATS) will be provided and will allow the generator to be turned on automatically in case of a power outage. The ATS will ensure smooth operation should a power outage occur at night.
4. Since the operation of the booster pumps is controlled by SCADA based on water level in the Tanks 2 and 3, the SCADA system and associated level sensors will need to be powered as well for the system to operate smoothly without operator intervention. BP 3&4 will be controlled using a pressure transducer installed on the booster pump discharge line since no generator is being provided at Tank 3 site.
5. The portable generator will be located at the Office Site and moved to well sites 2 or 3 as needed. The generator will be used to power the central SCADA system located at the office to ensure uninterrupted system monitoring.
6. Manual Transfer Switches (MTS) will be installed at Wells 2 and 3 along with an electrical panel to allow the generator to be plugged in to start the well pump as needed.
7. A start up sequence for each site will be planned during the design phase.

2.4 Required Infrastructure Changes

The following changes are recommended to the existing infrastructure to accommodate the new generators.

- Well 1 will require a main breaker to be installed in the Utility Metering Panel. There is space to mount a circuit breaker.
- Well 2 requires replacing the existing Utility Metering Panel with a new Utility Metering Panel with a built-in 100A main breaker.
- Well 3 will require a main breaker to be installed in the Utility Metering Panel. There is space to mount a circuit breaker.
- Booster Pump Station (BP1/BP2) will require replacing the existing panelboard with a panelboard with more circuits.
- Booster Pump Station (BP3/BP4) will require replacing the existing panelboard with a panelboard with more circuits.

2.5 Required Permits

The following permits are expected for this project:

- Mojave Desert Air Quality Management District; Emergency Diesel Generator
- County of San Bernardino; Building Permit
- San Bernardino County Fire Department; Hazardous Materials Handler Permit
- California Environmental Quality Act; Categorical Exemption

2.6 Summary of Planning Tasks

2.6.1 Planning

- Execute contract with electrical engineer - Complete
- Confirm generator size with electrical engineer - Complete
- Confirm required electrical infrastructure changes to facility site - Complete
- Confirm availability of generator(s) with manufacturer - Complete
- Prepare plans for all generator locations and specifications.
- Submit plans and specifications to Project Manager and regulating agency.
- Acquire all necessary permits.
- Coordinate construction activities with applicant and installer.

2.6.2 Implementation

- Provide oversight of onsite installation.
- Prepare an Installation Summary Report

2.6.3 Operation and Maintenance Support

- Review installation and O&M requirements with applicant
- Assist applicant with required record keeping.

2.7 Preliminary Cost Estimate

The total cost of providing backup generators at JRCWD is estimated to be approximately $1,230,000.

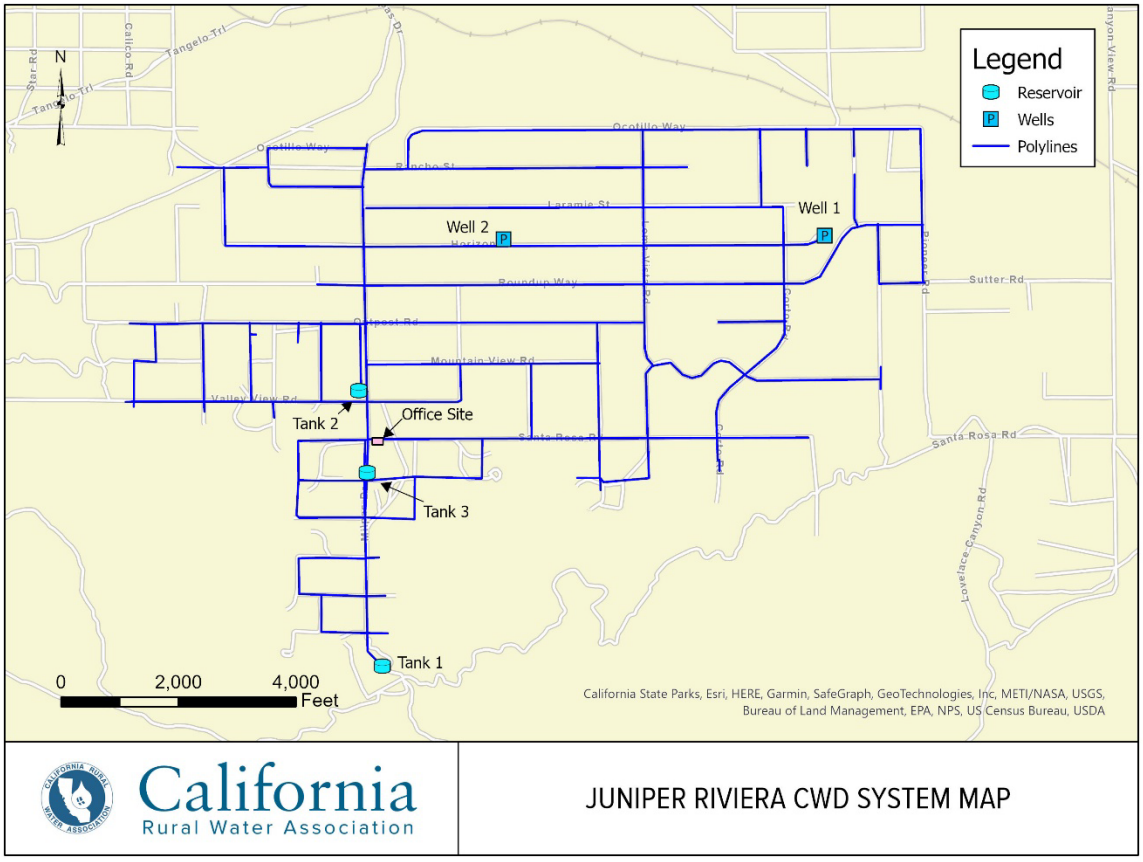
A detailed cost estimate can be found in Appendix C.

2.8 Estimated Schedule

Task	Description	Duration
Planning	Confirm generator size and place order; Prepare plans and specifications; Acquire all necessary permits	3-4 months
Construction	Receive generator from vendor; install generator	9-12* months

*** Following completion of planning task; Depending on generator availability**

Appendix A



California Rural Water Association

JUNIPER RIVIERA CWD SYSTEM MAP


Tank 3


Tank 2

Appendix B

California Rural Water Association **Preliminary Construction Estimate**

Client: **JRCWD** **Date:** 3/14/2023

Project: **Backup Generator Program** **Prepared By:** OM

No.	Item	Quantity	Unit	Unit Cost	Cost
1	Mobilization / Demobilization	10%	LS	-	$ 78,000
2	Well 1 Generator and Electrical Upgrades	1	LS	$ 144,200	$ 144,200
3	Well 2 Electrical Upgrades	1	LS	$ 51,600	$ 51,600
4	Well 3 Electrical Upgrades	1	LS	$ 47,400	$ 47,400
5	District Office Electrical Upgrades	1	LS	$ 20,400	$ 20,400
6	Booster Pump 1&2 Generator and Electrical Upgrades	1	LS	$ 169,900	$ 169,900
7	Booster Pump 3&4 Generator and Electrical Upgrades	1	LS	$ 169,900	$ 169,900
8	Portable Generator - 100kW	1	LS	$ 115,000	$ 115,000
9	Concrete Slabs for Stationary Generators	3	LS	$ 19,300	$ 57,900
10	Permitting	1	LS	$ 2,000	$ 2,000
11	0	1	LS	$ -	$ -
12	0	1	LS	$ -	$ -
13	0	1	LS	$ -	$ -
14	0	1	LS	$ -	$ -
15	0	1	LS	$ -	$ -
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26	0	1	LS	$ -	$ -
27	0	1	LS	$ -	$ -
28	0	1	LS	$ -	$ -
29	0	1	LS	$ -	$ -
30	0	1	LS	$ -	$ -

SUB-TOTAL ESTIMATED BID COST =	$857,000
PROJECT ADMINISTRATION COSTS:	
Construction Inspection:	$37,000
Construction Management:	$37,000
Labor Compliance Program:	$14,800
PRE-DESIGN LEVEL CONTINGENCY @ 30% =	$284,000
ESTIMATED PROJECT COST:	**$1,230,000**

CALIFORNIA RURAL WATER ASSOCIATION
JUNIPER RIVIERA COUNTY WATER DISTRICT
GENERATOR PROJECT
JANUARY 2023

Electrical Site Totals	Materials	Labor, Shipping, Utility	
Well 1	$ 94,666	$ 49,500	$ 144,166
Well 2	$ 20,344	$ 31,220	$ 51,564
Well 3	$ 17,631	$ 29,720	$ 47,351
District Office	$ 9,982	$ 10,460	$ 20,442
100kw generator with trailer	$ 115,000		$ 115,000
Boster Pump BP1/BP2	$ 113,817	$ 56,100	$ 169,917
Boster Pump BP3/BP4	$ 113,817	$ 56,100	$ 169,917
Subtotal	$ 485,256	$ 233,100	$ 718,356
Contingency (15%)	$ 72,788	$ 34,965	$ 107,753
Construction Total	$ 558,045	$ 268,065	$ 826,110