California WATER COMMISSION

Water Storage Investment Program Concept Paper Form

Please complete the questions below and return your completed concept paper by email to cwc@water.ca.gov by 5:00 p.m. on March 31, 2016. Completed concept papers should not exceed four pages.

Contact Information

Contact Name: Christine Zimmerman	
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Phone Number: (661) 410-7500	
Agency/Organization Name: Valley Water Management Company	
Agency Type (select one):	☐ Public Agency ☒ Nonprofit Organization ☐ Public Utility ☐ Tribe ☐ Mutual Water Company ☐ Local Joint Powers Authority ☐ Other:

Project Information

Project Name: Treatment and Groundwater Banking of Oil Field Produced Water	
Project Type:	☐ CALFED Surface Storage ☒ Groundwater Storage ☒ Groundwater Contamination Prevention or Remediation ☐ Conjunctive Use ☐ Reservoir Reoperation ☐ Local Surface Storage ☐ Regional Surface Storage ☐Other:
Estimated Project Cost: $3,250,000	
Estimated WSIP Funding Request: $750,000	

Please describe your project, including location, water source, facilities, and operations:

Valley Water Management Company (VWMC) manages oil field produced water from a broad range of oil producers most of whom, in the three proposed project areas, are very small independent producers. Historically, the gathered produced water has been disposed of via evaporation and percolation. In the Kern Front #2 area, the produced water is blended with fresh water and utilized by Cawelo Water District's agricultural end users. In the Edison Race Track area, the produced water is sent to a combination of percolation ponds and sprayfield system in the immediate vicinity of the Arvin-Edison Water Storage and Olcese Water Districts. Finally, produced water in the Maricopa area facilities is sent to evaporation and percolation ponds in the West Kern Water District.

Low salinity produced water is a very important source of water for agriculture in this region. High quality produced water is used for both irrigation and groundwater recharge. The objective of this project is to increase the supply of high quality water in the region by treating lower quality produced water to effluent standards compatible with existing beneficial uses.

This project proposes to utilize a pilot study already under construction for the Edison Race Track area at all three project areas to determine feasibility of treating the produced water to effluent standards compatible with existing beneficial uses so that the treated produced water can be utilized for groundwater banking in the respective water districts. The project proposes to utilize existing monitoring well data, as well as to install additional wells, in order to establish the feasibility of

groundwater storage in these issues as well as to quantify the prevention and/or remediation of existing groundwater relative to its beneficial uses.

In addition, this project proposes to look at existing or legacy volumes of produced water already banked in the project area vicinities. These volumes of banked water would be quantified using historic discharge data dating back through the 1950s and 1960s. The feasibility of re-producing and treating this water would be considered under this project scope. VWMC has extensive water data for multiple facilities that can be shared with Lawrence Berkeley National Laboratory (LBNL).

LBNL will provide technical expertise to VWMC as part of this project and assist VWMC in submission of a full project proposal. Produced water has been identified as a potentially important water resource in drought stricken areas of the Western US, in part due to the location of oil and gas development in regions dependent on irrigated agriculture. LBNL is working with both industry and government to investigate beneficial reuse of produced water. Larger-scale demonstration projects, such as the project proposed here, are critical to determining the economic and environmental sustainability of water reuse in California. LBNL will provide independent validation of treatment outcomes and assist VWMC in investigating the effects of infiltrating produced water on groundwater sustainability.

Per Water Code section 79753, the Commission may only fund the public benefits of water storage projects. Further, ecosystem improvements must make up 50% of the funded public benefits (Water Code section 79756(b)). What public benefits does your project provide? (select all that apply):

☐ Ecosystem Improvements ☒ Water Quality Improvements ☐ Flood Control
☐ Emergency Response ☐ Recreation

Please describe the magnitude of the public benefits and how the project will be operated to provide the public benefits:
The three subject facilities represent approximately 9,000 acre feet of oil field produced water per year. While this may seem like a small volume of water relative to freshwater projects, it is most significant when the opportunity to convert the volume from a waste stream to a beneficial re-use stream new to the State's water balance. This water could be used in efforts to address legacy produced water issues, as well as for irrigation purposes.

Water Code section 79752 requires that funded projects provide measurable improvements to the Delta ecosystem or to the tributaries of the Delta. Please describe how your project provides ecosystem improvements in the Delta or tributaries to the Delta:
Beneficial re-use of oil field produced water in these areas provides additional water for recharge and recovery in these water districts and reduces their dependence on Delta water resources, allowing more water to remain in the Delta, thereby improving the Delta ecosystem.

Water Code sections 79755 and 79757 require the Commission to make a finding that a project will advance the long-term objectives of restoring ecological health and improving water management for beneficial uses in the Delta prior to allocating funding for a project. Please describe how your project could help advance the long-term objectives of restoring ecological health and improving water management for beneficial uses in the Delta:
This project allows for a reduction in demand on the Delta in the southern Tulare Lake Basin. This decreased demand over time advances the long-term objectives of restoring ecological health and improving water management beneficial uses in the Delta by finding non-Delta water resources for these districts demands.

Please describe any other benefits provided by your project, such as water supply reliability benefits, and the potential beneficiaries:
The small communities and agricultural end-users associated with West Kern, Arvin-Edison, Olcese, and Cawelo water districts will have a new beneficial re-use water source that is nearby and allows for groundwater recharge and recovery independent of State water resources supply systems. In addition, treatment of oil field produced water for beneficial re-use eliminates waste discharges in these areas.