

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

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Agency/Organization Name: Valley Mutual Water Company, a member of the Semitropic-Rosamond Water Bank Authority
Agency Type (select one): <input type="checkbox"/> Public Agency <input type="checkbox"/> Nonprofit Organization <input type="checkbox"/> Public Utility <input type="checkbox"/> Tribe <input type="checkbox"/> Mutual Water Company <input type="checkbox"/> Local Joint Powers Authority <input checked="" type="checkbox"/> Other: Public Agency, Mutual Water Company, or Joint Powers Authority (to be determined)

Project Information

Project Name: Willow Springs Water Bank (formerly Antelope Valley Water Bank)
Project Type: <input type="checkbox"/> CALFED Surface Storage <input type="checkbox"/> Groundwater Storage <input type="checkbox"/> Groundwater Contamination Prevention or Remediation <input checked="" type="checkbox"/> Conjunctive Use <input checked="" type="checkbox"/> Reservoir Reoperation <input type="checkbox"/> Local Surface Storage <input type="checkbox"/> Regional Surface Storage <input type="checkbox"/> Other:
Estimated Project Cost: \$200 M
Estimated WSIP Funding Request: \$100 M
Please describe your project, including location, water source, facilities, and operations: Willow Springs Water Bank (“WSWB” or the “Bank”) is a publicly owned (CalPERS) and privately managed water storage facility in the recently adjudicated Antelope Valley Groundwater Basin. The Bank’s environmental impact report (“EIR”) was approved by Kern County in 2006; the EIR approved the bank for instantaneous recharge and recovery capacities of 350 cfs and 250 cfs, respectively, and 500,000 to 1,000,000 AF of water storage. Situated near major water conveyances (California Aqueduct, AVEK West Feeder) on highly permeable soils, the Bank offers water storage opportunities to both upstream and downstream State and local water agencies. Its location within the Antelope Valley results in excellent water quality, which has been monitored annually since 2008 by a Monitoring Committee. The area for recharge and recovery facilities is located about 10 miles due west of the town of Rosamond, CA and covers about 13,400 acres. WSWB is uniquely situated to contribute towards enhanced efficiency of the State Water Project operations and Delta restoration measures. The Bank has been in partial operation since 2010. In 2011, it recharged roughly 20,000 acre-feet. The Bank’s ultimate facilities include about 1,000 acres of percolation ponds, pump stations, 62 water wells, and a 72”-84” two-way pipeline to deliver water to and from the CA Aqueduct. It is also co-located with about 640 acres of solar panels. The capital cost estimate of \$200 M is based on an updated project master plan, completed in early 2016. This unit capital cost of \$200/AF provides a low cost source of new storage volume. WSWB is actively seeking additional partners and customers to take advantage of this cost-

effective storage.

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:

Willow Springs Water Bank is a multi-benefit project. Storage capacity will be set aside for (1) ecosystem, (2) water quality, (3) emergency response, (4) flood control, and (5) recreation:

(1) Ecosystem The Bank will provide water for the ecosystem during dry and low flow years via reservoir reoperations and exchanges. The Bank's location and large capacity makes it ideal to be operated in conjunction with State's existing surface reservoirs. The new water supply needed for public benefits will be created by banking water that otherwise would spill from San Luis Reservoir in very wet years. Once stored in the Bank, water will be shifted from the Bank into Lake Oroville via exchanges. Having the surplus water stored in the Bank will reduce the amount of Delta water exports during dry years. This provides the additional water needed to improve the ecosystem. The economic value of the ecosystem benefits will be at least 50% of the total value of the public benefits.

(2) Water Quality Similar to the ecosystem improvements, the Bank will use reservoir reoperations to improve the water quality of the Delta. Pumping from the Delta will be reduced during dry years as water previously stored with WSWB can be used to supplement supplies south of the Delta, which allows more water to flow into the Delta. This will result in water quality improvements through the release of cold water that improves Delta water quality and protects against salt water intrusion.

(3) Emergency Response The Bank will provide stored water south of the Delta for emergencies. This will provide water to meet demands south of the Delta if the levees fail due to earthquakes, floods, rising sea levels, etc.

(4) Flood Control Reservoir reoperations as described above will also help with flood control. It will provide more empty storage space in the existing surface reservoirs to capture flood flows by shifting water into the Bank via exchanges.

(5) Recreation Hiking trails will also be developed at the Bank as a recreational opportunity for the local community, particularly for nearby Disadvantaged Communities.

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:

The Bank proposes to dedicate a portion of its capacity to provide public benefits including ecosystem improvements and species protection in the Delta. New water supply will be created when the Bank captures surplus water spills from San Luis Reservoir. In normal years, the captured spill water will be retained in WSWB. During dry or low flow years, the banked water will be delivered to Southern California while an equivalent amount of water stored in the surface reservoirs in the northern parts of the State will be released into the Delta. These integrated operations will reduce the Delta freshwater exports during low flow years, and provide for reliable inflows to counteract seawater intrusion and consequent impacts on wildlife and fish habitat. Quantification of the improvements will be monitored

by tracking changes in Delta water temperature, salinity, dissolved oxygen, flow, etc. and relating them to the quantity of water dedicated to the ecosystem. Storage of water earmarked for the ecosystem in a groundwater bank increases the amount of water available for the ecosystem because it avoids annual evaporation losses waiting for a dry year. During emergencies the Bank can also use stored water to meet demands and prevent further habitat degradation. Therefore the Bank provides measurable ecosystem improvements in the Delta.

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:

Willow Springs Water Bank will allow the capture of additional or 'new' water during wet years in the existing surface reservoirs via reservoir reoperations. This will be done by capturing water that otherwise would have spilled from San Luis Reservoir and dedicating it to public benefits (spills occur when Delta constraints force the pumps at Banks Pumping Plant to be shut down early, which is the functional equivalent of allowing water to spill to the ocean). This will increase the yield of the State Water Project. The Bank will advance the long-term ecological health and water management objectives with the following:

- Reliable Operations The bank provides firm put and take capacity with direct recharge to percolation ponds and direct well extraction and pumping back to the California Aqueduct). Willow Springs Water Bank is located in an adjudicated basin which provides legal certainty for extractions and a third party water-master for transparency. The Bank has excellent water quality, avoiding the potential operational constraints due to groundwater contaminants.
- Supplements San Luis Reservoir. The bank can be used to supplement the annual operational storage in San Luis Reservoir needed to meet seasonal demands. This is possible because its reliable put and take capacity enable it to be functionally equivalent to San Luis Reservoir.
- Minimizes Environmental Impact The Bank provides new storage without impacting the environment. It avoids the concurrent ecological damage often associated with the large new dams needed for surface reservoirs such as flooded habitat, flooded archeological sites, flooded Native American sites, etc. Instead, by operating in conjunction with existing surface reservoirs, it provides new storage and Delta ecosystem benefits without damaging the environment
- Shovel Ready The Bank can be online in as little as 2-3 years. The rapid online date is possible because the project is "shovel ready" with a completed EIR and it does not involve major new earthworks such as a large new dam. This provides a unique opportunity to meet short-term as well as long-term water management objectives for the Delta: it can capture surface water and mitigates flood risks during the 5-10 years while other large storage projects are planned, designed, and built.
- Climate Change: Rising air temperatures and the shrinking snowpack due to climate change will increase the need for new storage capacity. Storage capacity south of the Delta will be especially valuable as more intense and severe floods coupled with sea level rise increase the risk of Delta levee failures. This emergency water is better held in a groundwater bank because it does not evaporate each year.
- Increased SWP yield The yield of the existing State Water Project will be increased with the capture of spills from San Luis Reservoir that otherwise would spill to the ocean.

Please describe any other benefits provided by your project, such as water supply reliability benefits, and the potential beneficiaries:

Other benefits are as follows:

- a. Operational Storage The Bank can be used to provide storage on a short-term annual operating basis or a long-term carryover basis. Seasonally, the Bank can be operated as an expansion of San Luis Reservoir to address annual operational water quality problems when storage volumes drop below 300,000 acre-feet. This additional operational storage can be created without the need to take Sisk Dam out of service during construction to raise the dam.
- b. Diversifies the Storage Portfolio The Bank is located in Southern California and therefore allows the State to have a more geographically distributed storage portfolio. Water is stored downstream of the large pumping lift at Edmonston Pumping Plant, increasing the flexibility of when energy is used to pump water over the Tehachapi Mountains. This can provide operational flexibility for the State and optimize when water is pumped to Southern California. Expanding storage south of the Delta is important because it mitigates the risk to water supplies in the event of Delta levee failure after earthquakes, floods, etc.
- c. Mitigates East Branch bottleneck The Bank enhances the capacity of the East Branch of the California Aqueduct by providing a place to store water upstream of the hydraulic bottleneck at Pearblossom Pumping Plant.
- d. Environmental Benefits As a groundwater bank, it does not flood habitat, archeological sites, or Native American sites when filled with water. Instead, it maintains the agricultural character of the area by growing crops when not used for percolation. The project also helps address the existing regional overdraft with the 10% of water that is left behind in the basin for every acre-foot banked.
- e. Helps DACs The project also has the potential to help out Disadvantaged Communities (DACs) in the region. It will provide hiking trails for recreation. It can also provide storage for imported surface water which can be used to replace well water in DAC systems with water quality problems.
- f. Part of the IRWMP The Bank is an important component of Antelope Valley Integrated Regional Water Management Plan. It is a public and private hybrid that can be integrated with water recycling, water supply, water quality and other groundwater banking projects in the region and in the State.
- g. Pumped Storage The Bank is evaluating the potential for a 6 to 12 MW pumped storage component using pipes, reservoirs, and pumping units planned for the Bank. This evaluation is funded via a grant from the California Energy Commission. The project had the highest ranking of all 21 projects submitted to the CEC for funding requests (GFO-15-309 Group 11). Energy could be generated during peak hours every day, regardless of whether the bank is recharging, extracting, or idle. This will improve the penetration of both solar and wind renewable energy sources that are plentiful in the Antelope Valley, helping the state meet renewable energy goals.
- h. Solar co-location Water bank facilities are co-located with 640 acres of solar panels, enhancing the State's ability to meet renewable energy goals. Co-location is possible because the solar arrays use the surface of the ground while the water bank facilities are largely underground.