



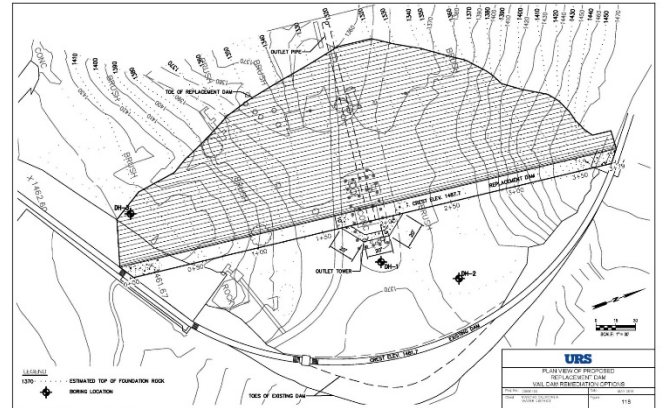
# RANCHO CALIFORNIA WATER DISTRICT

## Vail Dam Rehabilitation Project

### Vail Dam

Vail Dam was constructed by the Vail Company in 1949 as a 152-foot high concrete arch dam for irrigation and water supply purposes. Vail Dam is located east of the City of Temecula, in southwest Riverside County, in the State of California. Vail Dam has a maximum storage capacity of 42,680 acre-feet, a surface area of 1,030 acres and the dam forms Vail Lake along Temecula Creek, within the Santa Margarita River Watershed. Appropriations Permit No. 7032 allows up to 40,000 acre-feet of stormwater to be diverted, stored and beneficially reused.

Rancho California Water District (RCWD) acquired Vail Dam in 1978 for water supply purposes and enhancement of RCWD's groundwater recharge and recovery program. RCWD utilizes Vail Dam for water reliability purposes by providing an annual operating quantity for water supply, drought storage capacity for recharge to the downstream groundwater basin, and an emergency water supply to RCWD during a short-term catastrophic event. Vail Dam also provides downstream flood control protection for the City of Temecula and the United States Marine Corps Base Camp Pendleton. In 2010, RCWD extended pipeline and pumping facilities to provide the ability to purchase, convey, and store imported water from MWDSC in Vail Lake. In addition, Vail Lake is not infested with Quagga or Zebra mussels.



### Rehabilitation Project

The California Department of Water Resources Division of Safety of Dams (DSOD) has determined that Vail Dam is deficient based on seismic stability and hydrologic analyses performed. Vail Dam is seismically deficient from over-stressing during a maximum credible earthquake and hydrologically deficient by over-topping during a probable maximum flood. Water stored behind Vail Dam has never over-topped the Dam structure, but has previously spilled over its spillway structures in major rain events that occurred in 1981 and 1993. DSOD determined the deficiency in 2012 when they updated their study and used different analysis than they previously had in 1980.

Upon review and confirmation of the analyses performed by the DSOD, RCWD has determined that replacing the existing concrete arch portion of the dam with a roller compacted concrete dam (approximately 6-feet higher and 400 feet in length) between the existing concrete abutments, will sufficiently mitigate the seismic and hydrologic deficiencies. The total estimated project cost is \$65 million.





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RCWD has completed a comprehensive geotechnical investigation and is near complete on a Preliminary Design Report (PDR) with 30% complete Design Drawings for the roller compacted concrete dam. Upon completion of the 30% Design, the Final Design and Environmental compliance phase of the project is estimated to take approximately 2 years and construction will take another 2-1/2 years to complete.



### Benefits of Vail Dam

Vail Dam Reservoir captures runoff from the watershed and RCWD uses this water to augment its overall water supplies. RCWD utilizes controlled releases from Vail Lake, as available, to recharge the downstream groundwater basin. Groundwater is extracted from the underlying basin through RCWD owned and operated wells.

- Provides a reliable supply of water for

RCWD customers

- Relieves stress on the California Bay-Delta imported water supply
- Provides drought storage capacity
- Provides an emergency water supply to RCWD during a short term catastrophic event
- Provides downstream flood control protection to the City of Temecula and the United States Marine Corps Base Camp Pendleton

### Other Dams Facing Similar Issues

Almost everyone is familiar with the recent collapse of Oroville Dam's principal spillway. The crisis exposed weaknesses with the dam complex and also showed the stress on America's aging infrastructure.

- By 2020, 65% of dams in the U.S. will be past their designated lifespan of 50 years
- The American Society of Civil Engineers classifies nearly 4,000 dams as "deficient," meaning these facilities have aged to the point where they are more susceptible to failure