

## **Large new dam construction steaming ahead in Santa Clara and Alameda County**

By Paul Rogers

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A venerable Bay Area landmark. Built decades ago, but now in danger of a collapse in a major earthquake. Engineers beating a path to restore it with a massive construction project.

The Bay Bridge? Think again.

A similar effort — without the fanfare or attention — is gaining momentum to rebuild a vital linchpin of the Bay Area's Hetch Hetchy water system.

Environmental studies are due out Tuesday on a \$409 million project to replace Calaveras Dam, a 210-foot-high structure east of Milpitas in the remote, oak-studded hills along the border between Santa Clara and Alameda counties. The project by the San Francisco Public Utilities Commission, the first new Bay Area dam in a decade, will also potentially save lives in case of a disaster and rekindle the supply of endangered steelhead trout.

When it was built in 1925, Calaveras was the tallest earth-fill dam in the world, an engineering marvel that created a lake three miles long. But in 2001, the state Division of Safety of Dams declared it unsafe for a major earthquake. If the dam collapsed during such a quake on the nearby Calaveras Fault, it would send a 30-foot-high wall of water rushing into Fremont and toward Interstate 880, later studies showed. Such an event could potentially kill thousands of people.

"The original dam was built in a different era. In the 1920s, it was state of the art. But it was built with horses and wagons," said Dan Wade, the San Francisco PUC's manager of the Calaveras Dam project.

Because of the threat, the state ordered the reservoir drained to only 40 percent of capacity, losing enough water for 300,000 people a year.

With California struggling through the third year of a drought, the loss has come at a bad time.

South Bay impact

Unlike water from Hetch Hetchy Reservoir in Yosemite National Park, which flows to homes and businesses in San Francisco and northern San Mateo County, most of the Calaveras Reservoir's water serves South Bay communities like North San Jose, Palo Alto and Fremont.

The new dam will be the same size as the old one, built several hundred yards downstream on Calaveras Creek. Construction bids are scheduled to go out next year, with work beginning in 2011, and the project finished by 2015.

The base of the dam will be a quarter-mile thick, made with earth and rock quarried from the reservoir site and compacted with modern equipment far tighter than the old dam.

It will contain enough dirt and rock to fill 300,000 dump trucks, and be built to withstand a 7.2 magnitude quake, the largest that geologists believe is possible on the Calaveras Fault.

The current dam is considered safe now with its lowered level of water. It went unscathed on Oct. 30, 2007, for example, when a moderate 5.6 quake on the Calaveras Fault near Alum Rock Park shook communities from downtown San Jose to Monterey County. But as with the 1930s-era Bay Bridge, nobody wants to see how Calaveras Dam would perform in a massive quake.

"Certainly we are in a race against time," Wade said.

#### Colorful history

The original Calaveras Dam was built by California's most famous water engineer, William Mulholland. In 1913 Mulholland supervised construction of the Los Angeles Aqueduct, which brought the water from Owens Valley that enabled Los Angeles to grow into the nation's second-largest metropolis, a story on which the movie "Chinatown" is loosely based.

The first Calaveras Dam failed in 1918 when large sections slumped during construction, although no water was released. Mulholland's career ended in 1928 when another dam he built near Santa Clarita in Los Angeles County collapsed, killing more than 450 people.

When the new Calaveras Dam is finished, crews will carve a large notch in the old dam, allowing the reservoir to pour in behind it. The old dam will be left in place, looking like a peninsula of land sticking into the 96,000-acre-foot reservoir.

Originally, the PUC considered enlarging Calaveras Reservoir, but the high cost and expected opposition from environmental groups stalled that plan.

The clay core of the new dam, however, is built in a way that the reservoir could be enlarged fourfold someday.

The job is part of a \$4.5 billion renovation by the San Francisco PUC to upgrade its Hetch Hetchy water system to provide more reliability in earthquakes and droughts.

The largest water system in the Bay Area, it delivers water 167 miles from Hetch Hetchy Reservoir in Yosemite to Crystal Springs Reservoir along I-280 in San Mateo County. It serves 2.5 million Bay Area residents from Alameda County to North San Jose to San Francisco.

Another agency, the Santa Clara Valley Water District, provides water to 1.8 million people in Santa Clara County from groundwater and the delta.

### Steelhead benefit

Environmentalists say that in addition to improving public safety, the Calaveras Dam project can go a long way to restoring endangered steelhead trout.

"This is the biggest restoration opportunity for steelhead in the Bay Area," said Jeff Miller, director of the Alameda Creek Alliance, a nonprofit group.

Historically, Alameda and Calaveras creeks had rich runs of steelhead and salmon. But starting in the 1870s, the creeks were dammed, diverted and altered, virtually wiping out the fish.

Over the past 10 years, environmental groups have lobbied the San Francisco PUC and other agencies to remove five small dams and other impediments on Alameda Creek, which starts near Mount Hamilton and empties into the bay in Fremont.

When fish ladders are built around the remaining four impediments, as is expected in the next several years, it will open 26 miles of Alameda Creek from the bay to Calaveras Dam for fish.

"There certainly are going to be some steelhead. If they will be viable, we don't know. But we are going to make a run at it," said Tim Ramirez, natural resources manager for the San Francisco PUC.

A battle looms, however, over how much water the dam will be required to release for fish. For years, the PUC refused to release any water. Now it is proposing to release 20 to 42 cubic feet per second from the Calaveras Dam complex, but Miller said he'd like to see more than 100, and federal agencies may require a larger number.

"We've made an incredible amount of progress in getting fish upstream," said Miller "The last piece of the puzzle is getting the flows. The Calaveras Dam project is key to that."

