



# Seismic Improvement Program

Spring 2004



## Seismic Upgrades to Protect Water System

Less Damage and Quicker Restoration of Service

In 1995, EBMUD began work on a long-term Seismic Improvement Program (SIP) to protect its customers and the local economy from long water service disruptions following a major earthquake. Upgrades such as flexible pipe connections, stronger pipes, well-anchored pumps and equipment, and reinforced distribution reservoirs will reduce earthquake damage and speed system recovery.

The SIP addresses the specific effects of earthquake damage with seven sub-programs:

- **Reservoir Upgrades:** Anchoring and reinforcing local water storage reservoirs make them more likely to survive a large earthquake. So far, 53 of 73 reservoirs have been upgraded or replaced.
- **Pumping Plants:** Pumping plants move water through pipelines and fill storage reservoirs. EBMUD has upgraded all of its pumping plants to protect critical equipment and increase the likelihood that these facilities will continue to function after an earthquake.
- **Transmission System and Fault Crossings:** Water distribution pipes cross active earthquake faults at more than 200 locations. Using new technology such as flexible joints and flexible hoses, EBMUD can minimize pipe rupture and reroute water around broken pipes. Upgrades are complete at 86 locations where critical pipes cross faults and 14 more fault crossings are scheduled for upgrades in the coming years.
- **Claremont Corridor:** The Claremont Tunnel, which crosses the active Hayward Fault, carries up to 175 million gallons of water a day from treatment facilities in Orinda to customers west of the Oakland-Berkeley hills. Construction work for the tunnel's seismic improvements will begin in the summer of 2004.

- **Water Treatment Plants:** Seismic work at these plants includes strengthening buildings and anchoring pipelines and equipment to minimize damage and improve EBMUD's ability to provide treated water to customers after an earthquake. Seismic improvements to all water treatment plants are now complete.



*A reservoir is reinforced with seismic cables and shotcrete.*

- **Southern Loop:** EBMUD has completed the 11-mile Southern Loop Pipeline, a major element of the SIP. This emergency pipeline runs from San Ramon to San Leandro and provides an alternate water supply route to serve either side of the East Bay hills at the southern end of the EBMUD water distribution system. The pipeline adds vital backup protection for water treatment and distribution systems and allows greater flexibility in water operations following a catastrophic earthquake.
- **Building Upgrades and Equipment Anchorage:** This work will protect the lives of employees and visitors during an earthquake and ensure that facilities remain functional after a disaster. Making these buildings safe will allow EBMUD to respond to a post-earthquake emergency more quickly. This portion of the SIP is under way and will be completed in 2005.

EBMUD is the first water agency in the United States to retrofit its facilities on such a comprehensive scale and is internationally recognized for its proactive approach to seismic risk assessment and mitigation.

Seismic experts predict a 70 percent chance of at least one 6.7+ magnitude earthquake striking the San Francisco Bay Area by the year 2030, causing catastrophic damage throughout the region. EBMUD has already completed 80 percent of its planned SIP upgrades and is on course to complete nearly all elements within the next two years. With each improvement, earthquake damage will be less and restoration of service will be faster.

Project	% Complete
Reservoir Upgrades	77%
Pumping Plants	100%
Transmission System & Fault Crossings	75%
Claremont Tunnel	25%
Water Treatment Plants	100%
Southern Loop	100%
Building & Equipment Anchorages	35%
<b>Total</b>	<b>80%</b>

**For More Information**

For questions on the Seismic Improvement Program and any other EBMUD program or service, please contact the Office of Public Affairs at (510) 287-0138.

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