

2004

PROGRESS REPORT

2005



10 YEARS OF ACCOMPLISHMENTS

Seismic
Improvement
Program



c o n t e n t s

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In 1994, East Bay Municipal Utility District's (EBMUD) Board of Directors formally adopted a 10-year \$189 million Seismic Improvement Program (SIP) and authorized work to begin in July 1995. With 2006 now here, EBMUD is proud of the 10 Years of Accomplishments that provide stronger safeguards to protect lives, preserve the health of the regional economy and maintain our customers' investment in its water distribution system.

EBMUD has put its seismic protections in place before others in the region have started, and provided a model program for the rest of the country to follow. EBMUD continues to receive recognition for its forward-thinking and proactive approach to strengthen, reinforce and upgrade its water distribution system on such a comprehensive scale.

Four main goals for post-earthquake water service guided EBMUD to protect its water system through the SIP:

- **Life Safety:** *Prevent the loss of life due to the failure of any EBMUD facility.*
- **Fire Service:** *Improve water service in all areas, especially high fire-danger zones.*
- **Customer Service:** *Restore water service quickly.*
- **Water Quality and Public Health:** *Guarantee that all water entering the distribution system is fully treated.*

We cannot prevent earthquakes, but with new technology and innovative seismic engineering we can limit their damage. At the end of 10 years, EBMUD has successfully accomplished over 300 projects and, with the strengthening of the Claremont Tunnel, the last major component of the SIP is nearing completion.

Innovation



FROM THE GENERAL MANAGER

Living in earthquake country, we know that a major earthquake will happen; what we don't know is when or where. As a forward-thinking public agency, EBMUD has long recognized the need to be prepared and, in 1995, became the first water utility to undertake a major seismic retrofit program. EBMUD's multi-million dollar Seismic Improvement Program has recently completed 10 years of accomplishments. Innovative solutions and leading edge technology have been characteristic of EBMUD's comprehensive approach. Using the newest and best technology available improves our water distribution system and will speed our region's recovery from a major seismic event.

After upgrading more than 300 facilities, there are only a few more key projects to complete. The Claremont Tunnel project, which will strengthen our major water transmission tunnel, is nearing completion and our emergency response and recovery plan is being updated. Investing in these upgrades now and having the emergency response and recovery plan in place will provide our customers with a more reliable water system, support the operation of businesses and industries in our region and protect our customers' investment in water treatment, storage and distribution.

EBMUD's outstanding accomplishments during these past 10 years have made it possible to deliver a water system that will protect lives, improve fire service, and distribute the highest quality of water to the millions of customers in its service area, even in the wake of a major earthquake.

A handwritten signature in black ink that reads "Dennis M. Diemer". The signature is written in a cursive, flowing style.

Dennis M. Diemer

10 years

Building Structures and Equipment Anchorage projects

- 11 building structures and equipment anchorage projects have been seismically retrofitted for the protection of the public and staff.
- 2 are in progress (East Area Service Center and South Area Service Center).

Storage Reservoirs

- 71 storage reservoirs have been upgraded or demolished.
- 2 are in progress (Richmond and Berryman South).

Pumping Plants

- 110 pumping plants have been upgraded and emergency backup equipment added.

Water Treatment Plants

- 5 water treatment plants have been upgraded to improve post-earthquake operations by upgrading control buildings, filter gallery roofs, chemical tanks and pipelines, and pumps and valves.

Fault Crossings and Transmission System Improvements

- 51 pipeline fault crossings and 5 transmission system upgrades have been completed to improve flexibility for transmitting water in the distribution system and to mitigate landslide hazards for key pipes.

Southern Loop Pipeline

- Southern Loop Pipeline has been completed to provide redundancy in the water system on both east and west sides of the EBMUD's service area.

Claremont Tunnel

- Claremont Tunnel Seismic Upgrade Project will provide a reliable source of water to customers west of the Berkeley Hills. Construction is in progress with an expected spring 2007 completion date.



Projects Completed

- Building Structures & Equipment Anchorage
- Pumping Plants
- Reservoir Upgrades
- Treatment Plant Upgrades
- Transmission System & Fault Crossings
- Southern Loop Pipeline

Projects In Progress

- Building Structures & Equipment Anchorage
- Reservoir Upgrades
- Claremont Tunnel

In 1995

Just How Vulnerable Were We?

The probability of a magnitude 7 earthquake occurring along the Hayward Fault in the next 30 years is 32 percent. Should such an earthquake have happened in 1995, EBMUD customers could have expected:

- Water cut off within a matter of minutes for 63 percent of customers, including hospitals and disaster centers;
- Loss of water for fire hydrants and increased fire risk;
- Over 5,500 pipelines serving homes and businesses to break;
- A likelihood of untreated drinking water due to damage to four out of six treatment plants;
- EBMUD's most critical water conduit, the Claremont Tunnel, to be cut off west of the Oakland/Berkeley hills – affecting 70 percent of EBMUD customers;
- Major damage to 65 water reservoirs and about 87 pumping plants that would require months, or even years, to repair;
- An estimated impact of \$2 billion to the regional economy due to fire damage and a lack of water; and
- Interrupted water service to two thirds of EBMUD customers for weeks after an earthquake, with some customers lacking service as long as six months.

After 10 years of seismic improvements, EBMUD is now poised to provide water to our customers within a matter of days following a major seismic event, thereby protecting lives, preserving the health of the regional economy and maintaining our customers' investment in its water system.



Alternate

Water Supply Route

The Southern Loop Pipeline

Community Needs – An Alternative Way to Deliver Water

Following a significant earthquake on either the Hayward Fault (located west of the Oakland/Berkeley Hills) or the Calaveras Fault (located east of the Oakland/Berkeley Hills), existing critical transmission pipelines may be damaged and not available to deliver water from water treatment plants to distribution facilities.



On February 9, 2002 a modern tunnel-boring machine broke through the sandstone and siltstone, creating a 10-foot diameter, 1800-foot long tunnel beneath Crow Canyon Road linking together two vital portions of Alameda and Contra Costa Counties.

While other seismic projects are working to improve the post-earthquake reliability of these pipelines, the Southern Loop Pipeline provides an alternative way to deliver water between the Castro Valley area and the San Ramon Valley.



Workers lay a 36-inch diameter pipe during construction of the Southern Loop Pipeline along Crow Canyon Road in Castro Valley.

Goals Accomplished –

The Southern Loop Pipeline extends 11 miles between San Ramon and Castro Valley and ranges in size from 42 inches to 30 inches in diameter. The portion of the pipeline in San Ramon crosses the Calaveras Fault where up to 12 inches of ground movement could occur. At this location, a state-of-the-art pipeline design, involving thick and specialized steel pipe buried in a sand trench, will allow the pipeline to resist the movement on the Calaveras Fault. As the pipeline heads towards Castro Valley, it passes through an underground tunnel drilled at the high point of Crow Canyon Road. This tunnel allows for gravity flow of the water from east to west following an earthquake on the Hayward Fault. In Castro Valley, diesel-driven portable pumps are stationed next to the pipeline and can be quickly connected to push water back uphill to the San Ramon area in the event of an earthquake on the Calaveras Fault. Through a combination of careful routing and specialized design, this project helps to ensure a reliable water supply for the southern portion of EBMUD's service area.



Protected

Water Delivery System

Transmission Lines, Fault Crossings and Landslide Areas

Community Needs – Transmission Lines

Following a significant earthquake event on the Hayward Fault, transmission lines west of the Oakland/Berkeley hills may not be available to transmit water from water treatment plants to distribution facilities due to damage caused by landslides, liquefaction, and ground movement. To meet the service goals of life safety, water quality, fire and customer services, the Transmission System Upgrades Project was implemented. A portion of this project included procuring large portable pumps and constructing pump connections to move water. The main function of the portable pumps is to bypass broken sections of pipeline to move water from where it is available to where it will be needed.

Goals Accomplished –

A number of pump connections have been strategically placed to provide redundancy and flexibility in operating the system following an earthquake. Depending on the location of damaged pipelines or aqueducts, three portable pumps will be placed at the locations that will be most effective in moving water to where it is needed.



Crane lowering a shoring box (above) to reinforce the sides of a major transmission pipeline crossing a fault at Lake Temescal. With the shoring box in place (left), work to prevent water loss at this fault crossing location was completed.

Community Needs – Protection at Fault Crossings, Landslide and Liquefaction Areas

Two active faults are present in the EBMUD service area – the Hayward and Calaveras Faults. The Hayward Fault passes through the entire service area and is the biggest hazard to the EBMUD service area. The probability of a magnitude 7 or larger earthquake on the fault in the next 30 years is approximately 32 percent. An earthquake of that magnitude could result in earth displacements of over 6 feet. The northern section of the Calaveras Fault enters into EBMUD's service area. This fault is not as hazardous as the Hayward Fault in terms of earthquake magnitude and risk of occurrence. Nonetheless, it is capable of producing earth displacements of over 3 feet.

There are real hazards to pipelines that cross earthquake faults. The buried pipe is embedded and restrained by the ground on each side of the fault. When movement develops across the fault due to slow fault movements (creep) or abrupt offsets during major earthquakes, pipe deformations occur, with possible rupture. Should the pipe rupture and a leak or complete break occur, it can cause life-safety risks or disrupt fire-fighting capabilities. Approximately 225 pipelines were initially identified as crossing the two major faults in EBMUD's service area. Supplemental studies identified critical pipelines and reduced that number to 112 prone to fault crossings or landslide/liquefaction areas.

Goals Accomplished –

Four major upgrade components were developed for pipeline fault crossings and landslide damage:

- **Emergency Bypass System** – temporary hoses are placed on either side of the fault, landslide or liquefaction area to bridge the broken pipeline.
- **Remote/Automatic Seismic Isolation Valves** – a shutoff valve automatically closes off water leakage.



Workers install a 42-inch manifold to protect critical pipelines prone to landslide damage.

- **Pipeline Replacements** – use of improved pipe material such as high-density polyethylene or coated steel to accommodate ground movement.
- **Flexible Joints** – these can accommodate ground movement by allowing the pipe to deflect up to 15 degrees at each joint. The joint works like a telescope to allow the pipeline to compress or stretch without breaking, and also works like a ball and socket that allows the pipeline to deflect. These types of flexible joints have been installed at various locations throughout EBMUD.



Reliable

Water Storage Facilities

Reservoir Upgrades

Community Needs – Protection of Reservoirs

EBMUD has approximately 173 reservoirs located throughout its service area that store water for local communities. It is important to keep critical water storage tanks and the vulnerable piping around them functioning after an earthquake

to provide water for fire fighting and drinking. In addition, the most vulnerable facilities located close to a fault must be protected against collapse to prevent loss of life and property damage.

A worker prepares rebar and concrete from a demolished water storage tank for reuse and recycling.



- All of the old and seismically unsafe redwood tanks were replaced or decommissioned.
- Seismically unsound steel tanks were strengthened by adding steel hoop straps to strengthen the tank shell, and anchoring the tanks by welding steel straps to each tank and embedding them into a new perimeter ring footing buried in the ground.
- Landslide protection was provided for tanks that could be damaged by earthquake-triggered landslides through a combination of hillside strengthening and the addition of large retaining walls.
- Storage reservoirs located at the water treatment plants had their vulnerable roof structures strengthened against collapse.
- Remote controlled isolation valves were installed at strategically located reservoirs to prevent post-earthquake water loss from breakage of downstream piping.

Goals Accomplished –

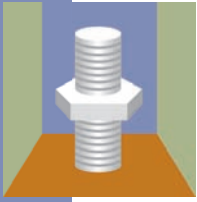
Using the following steps, we protected EBMUD's reservoirs to ensure treated water will be available after a major earthquake:

- Essential valves, piping and equipment to operate the reservoirs are located in concrete boxes next to the reservoir. These "valve pits" have concrete covers that can collapse in an earthquake, damaging the essential equipment and disabling reservoir operation. The reservoir upgrades included anchoring of the valve pit roofs to prevent their movement and collapse.
- The largest reservoirs have roofs that could collapse during an earthquake. Steel grates were installed over the outlet pipes at these reservoirs to prevent the pipes from being blocked by debris from roof collapse.

Worker sets foundation forms for a new perimeter reinforced concrete footing to anchor seismic cables and to prevent the water storage tank from sliding off its foundation.

- Concrete water tanks near the Hayward and Calaveras Faults were strengthened against collapse by wrapping each tank with high-strength wire cables, installing multi-strand anchors to provide tie-down, and adding new footings to resist sliding. In addition, cracks were repaired and interior sealants and coatings were replaced to protect against leakage.





Safety

For the Community and our Employees

Building Upgrades and Equipment Anchorage

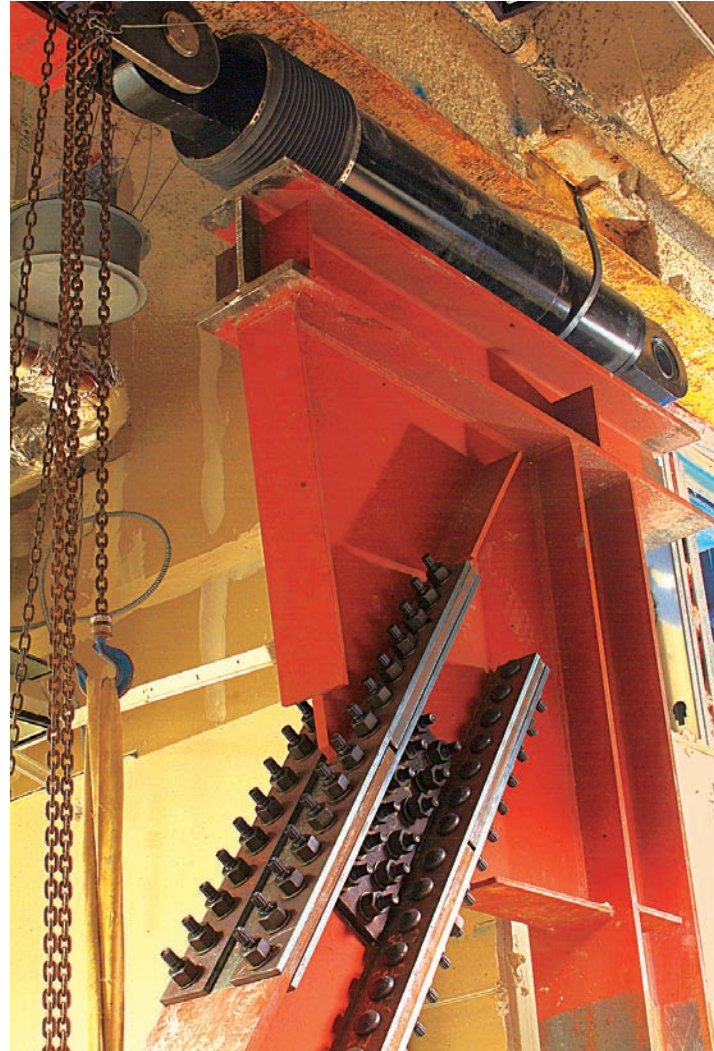
Community Needs – Protecting the Lives of Customers and Employees

Concerned with the direct threat of life safety, EBMUD needed to make substantial upgrades to its facilities to protect the lives of employees and the public for safe evacuation against life-threatening hazards following a major earthquake.

Goals Accomplished –

Anchoring of building contents and critical mechanical equipment at offices and buildings has been completed at EBMUD's north, south and east area facilities. Mechanical equipment such as gas heaters, emergency generators, chillers, pumps, fans and cooling towers were also secured against toppling. Anchoring building contents at the Administration Building, including securing bookcases, printer carts, vending machines and storage cabinets, is scheduled for completion in 2007.

One of the largest challenges was the seismic upgrade to EBMUD's Administration Building, which included construction of structural upgrades and the relocation of staff during construction. The method of seismic improvement is an energy dissipation system. This consists of adding 50 piston dampers (similar to shock absorbers) in new steel-framed structures at 29 sites and strengthening approximately 120 beam-column



The piston damper (shown in black above) is bolted into the ceiling above a welded steel frame and filled with viscous fluid to absorb intense seismic motion reducing the likelihood of a collapse.

connections in the Administration Building. The combination of stronger joints and piston dampers will allow the nine-story building to flex, but not collapse, during a major earthquake.



Dependable

Major Water Transmission System

Claremont Tunnel Project

Community Needs – Safely Conveyed Water Supply

The Claremont Tunnel was built in the 1920s to bring treated water approximately 18,000 feet through the Oakland/Berkeley Hills to customers in Berkeley, Oakland and Alameda. The Hayward Fault crosses the Claremont Tunnel, and earthquake damage to this 9-foot diameter tunnel would result in a loss of the primary water supply for nearly 800,000 people.

Goal Accomplished –

In February 2002, the Claremont Tunnel was taken out of service for seven days to conduct a physical inspection, the first in over 30 years. The inspection documented the tunnel's condition and confirmed that earthquake movement along the fault could cause the tunnel lining to break and that the structural integrity of the concrete lining was in jeopardy.

The solution was to construct a new 1,570-foot long tunnel that would bypass the vulnerable portion that crosses the fault, and to provide repairs and grout injection reinforcement for concrete lining in the remaining 16,000 feet of the existing tunnel.

Site construction for the new bypass tunnel began in June 2004 at the Claremont Center in Berkeley. In September 2004, excavation for the tunnel portal was completed and a road header began mining the access tunnel.

In late November 2004, the existing tunnel was drained and repairs and grouting work began. Since work on the existing tunnel can only occur during the low-water use winter months, work went



The "access" tunnel on the left will provide a permanent entry for the "bypass" tunnel on the right. The bypass tunnel will connect to the existing tunnel when completed in 2007.

1989

1990

1991

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1993

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1997

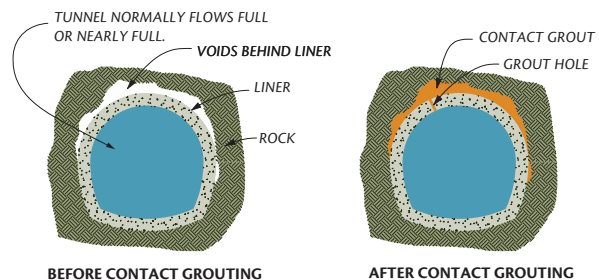


The tunnel excavation (above) is inspected continuously for changes in geology and to assure compliance with design requirements. The roadheader mining machine (below) grinds the rock face into fine gravel as it excavates.



on around the clock, 24-hours a day, seven days a week. On March 1, 2005 at the end of the winter outage, the repairs to the existing tunnel were completed along with half of the grouting of the existing tunnel liner.

At the end of July 2005, the length of the bypass tunnel was approximately 1,200 feet, including the critical mining activity within the heart of the Hayward Fault zone. Since ground conditions in the fault zone can change rapidly, strict safety procedures are exercised. Mining of the new bypass tunnel continued through late 2005, followed by the installation of the final concrete lining. The tie-in to the existing tunnel, and project completion, is anticipated for the winter of 2006-07.





Quality

Assurance for Water Customers

Water Treatment Plants

Community Needs – Treated Water

EBMUD's water treatment plants ensure that water delivered to our customers meets the high quality standards required by law and expected by our customers. At the start of the SIP, modeling showed that five of EBMUD's six water treatment plants could be out of service after a seismic event. One of the major treatment plants is within one-half mile of the Hayward Fault and could sustain major damage, while four of the other plants could each suffer varying degrees of damage – from failure of valves to falling roof materials – thereby degrading the water quality in these areas or creating a reduced water supply.



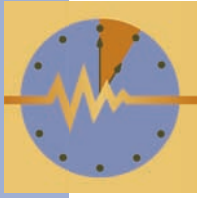
Workers install a seismic retrofit to strengthen the filter gallery at one of five upgraded water treatment plants.



Goals Accomplished –

The seismic program successfully retrofitted five of EBMUD's six treatment plants (the sixth plant was already scheduled for modernization). This major work included bracing electrical and mechanical equipment, adding concrete columns and shear walls for building stability, and providing seismic ties to increase the buildings' overall strength. Some of the most important upgrades included strengthening the buildings' housing filter controls and the sedimentation and filter basins to prevent their collapse during an earthquake.

Workers replace the wooden roof at Upper San Leandro and add a plywood diaphragm over diagonal timber sheathing to provide additional strength to the building.



Next Steps...

Public Education and Involvement

EBMUD's efforts do not end with the completion of this ten-year program. EBMUD will continue its outreach and act as a source of communication and information between all regional utilities and the public at-large through its publications and events.

EBMUD's seismic improvements were designed to help us better survive earthquakes by reducing known physical risks to our water system. Equally important are the efforts that can be taken by all East Bay residents and businesses. Individual efforts should be made to store bottled water and canned food, strap and secure water heaters, and prepare a family meeting place and message plan.

The purpose of any emergency plan is to help mobilize community resources quickly and effectively in the event of an emergency. You can be part of this mobilization by asking "Who's in charge?" in your community and "What should I do?"

For more information on how to prepare for and respond to a disaster, contact your local or state office of emergency services and your local Red Cross chapter.



EBMUD continues its public outreach to schools and the community-at-large by providing information that can assist residents and businesses in preparing for emergencies and disasters.

Facilities

Location	Project	Facility	FY05 Status
Alameda	Fault Crossings	Emergency Response and Recovery Planning	Complete
Alamo	Pumping Plants	Emmons	Complete
Alamo	Pumping Plants	Hill Mutual	Complete
Alamo	Pumping Plants	Ridgewood	Complete
Berkeley	Fault Crossings	Stonewall Rd. / Private Rd.	Complete
Berkeley	Fault Crossings	Canyon Rd. / Rim Way Rd.	Complete
Berkeley	Fault Crossings	Alvarado Rd. / Willow Walk	Complete
Berkeley	Fault Crossings	Santa Barbara Rd. / Florida Ave.	Complete
Berkeley	Fault Crossings	Tunnel Rd. / Vicente Rd.	Complete
Berkeley	Fault Crossings	Euclid Ave. / Rose St.	Complete
Berkeley	Fault Crossings	Summit Reservoir	Complete
Berkeley	Fault Crossings	Rim Way Rd. South / Canyon Rd.	Complete
Berkeley	Fault Crossings	Claremont Ave.	Complete
Berkeley	Fault Crossings	Dwight Way/Hillside Way	Complete
Berkeley	Fault Crossings	Rim Way Rd. at Stadium	Complete
Berkeley	Landslide and Liquefaction	Cragmont Ave. south of Acacia Ave.	Complete
Berkeley	Landslide and Liquefaction	Shasta Rd.	Complete
Berkeley	Landslide and Liquefaction	Michigan Ave. at Kentucky Ave. / 471 Vassar Ave.	Complete
Berkeley	Landslide and Liquefaction	The Alameda at Vallejo St. / Arlington Ave. at Santa Barbara Road	Complete
Berkeley	Landslide and Liquefaction	7th St. at Hearst and University Aves.	Complete
Berkeley	Landslide and Liquefaction	Yosemite Road	Complete
Berkeley	Landslide and Liquefaction	Contra Costa Ave.	Complete
Berkeley	Pumping Plants	Summit-East	Complete
Berkeley	Pumping Plants	Berkeley View	Complete
Berkeley	Pumping Plants	Dingee	Complete
Berkeley	Pumping Plants	Shasta	Complete
Berkeley	Pumping Plants	Woods	Complete
Berkeley	Pumping Plants	University	Complete
Berkeley	Pumping Plants	Berryman	Complete
Berkeley	Reservoir Upgrade	Shasta No. 1	Complete
Berkeley	Reservoir Upgrade	Shasta No. 2	Complete
Berkeley	Reservoir Upgrade	Summit	Complete
Berkeley	Reservoir Upgrade	Woods	Complete
Berkeley	Reservoir Upgrade	Summit Reservoir Automatic Shutoff Valve	Complete
Bixler	Pumping Plants	Bixler Low Lift Raw Water	Complete
Blackhawk	Pumping Plants	Acorn	Complete
Blackhawk	Pumping Plants	Blackhawk	Complete
Blackhawk	Pumping Plants	Blackhawk-East	Complete
Blackhawk	Pumping Plants	San Ramon	Complete
Blackhawk	Pumping Plants	Scenic	Complete
Castro Valley	Fault Crossings	Bayfair Reservoir / Fairmont	Complete
Castro Valley	Fault Crossings	Foothill / Carolyn	Complete
Castro Valley	Fault Crossings	Mattox / Marion	Complete
Castro Valley	Fault Crossings	Liberty / 164th Ave.	Complete
Castro Valley	Fault Crossings	South Reservoir	Complete
Castro Valley	Fault Crossings	Grove / Locust / Birch	Complete
Castro Valley	Landslide and Liquefaction	Grove Way at Oak St. near Bedford Dr.	Complete
Castro Valley	Pumping Plants	Almond	Complete
Castro Valley	Pumping Plants	Bayview	Complete
Castro Valley	Pumping Plants	Eden	Complete
Castro Valley	Pumping Plants	Fire Trail No. 1	Complete
Castro Valley	Pumping Plants	Jensen	Complete
Castro Valley	Pumping Plants	Jensen No. 2	Complete

Location	Project	Facility	FY05 Status
Castro Valley	Pumping Plants	Madison	Complete
Castro Valley	Pumping Plants	Norris	Complete
Castro Valley	Pumping Plants	Proctor	Complete
Castro Valley	Reservoir Upgrade	Stanton	Complete
Castro Valley	Reservoir Upgrade	Almond	Complete
Castro Valley	Reservoir Upgrade	South	Complete
Castro Valley	Reservoir Upgrade	Arcadian	Complete
Castro Valley	Reservoir Upgrade	El Portal	Complete
Castro Valley	Reservoir Upgrade	Fire Trail No. 1	Complete
Castro Valley	Reservoir Upgrade	Proctor No. 1	Complete
Castro Valley	Reservoir Upgrade	Cull Creek	Complete
Castro Valley	Reservoir Upgrade	Fire Trail No. 2	Complete
Castro Valley	Reservoir Upgrade	Proctor No. 2	Complete
Castro Valley	Reservoir Upgrade	South Reservoir Automatic Shutoff Valve	Complete
Castro Valley	Reservoir Upgrade	Jensen	Complete
Castro Valley	Transmission System Upgrade Project	No. 7 - Foothill Blvd.	Complete
Castro Valley	Transmission System Upgrade Project	No. 9 - John RCS	Complete
Clayton	Building and Equipment Anchorage	Kreagor Peak Microwave Station	Complete
Crockett	Pumping Plants	Rolph	Complete
Crockett	Reservoir Upgrade	Crockett	Complete
Danville	Reservoir Upgrade	Green Valley	Complete
Danville	Building and Equipment Anchorage	Mount Diablo Microwave Station	Complete
Danville	Building and Equipment Anchorage	Rocky Ridge Microwave Station	Complete
Danville	Pumping Plants	Apollo	Complete
Danville	Pumping Plants	Diablo	Complete
Danville	Pumping Plants	Las Trampas	Complete
Danville	Pumping Plants	Montair	Complete
Danville	Pumping Plants	San Ramon	Complete
Danville	Pumping Plants	Sky Terrace	Complete
Danville	Pumping Plants	Castenada	Complete
Danville	Pumping Plants	Danville	Complete
Danville	Reservoir Upgrade	Las Trampas	Complete
Danville	Reservoir Upgrade	Montair	Complete
Danville	Reservoir Upgrade	Sky Terrace	Complete
El Cerrito	Fault Crossings	Rifle Range Rd. / Linda Vista Dr.	Complete
El Cerrito	Fault Crossings	Mira Vista Country Club & Golf Course	Complete
El Cerrito	Fault Crossings	Arlington / Havens	Complete
El Cerrito	Landslide and Liquefaction	Ganges Ave. south of Fairview Dr.	Complete
El Cerrito	Landslide and Liquefaction	Potrero Ave. east of Roger Ct.	Complete
El Cerrito	Landslide and Liquefaction	Alva Ave.	Complete
El Cerrito	Landslide and Liquefaction	Carquinez Ave.	Complete
El Cerrito	Pumping Plants	Arlington	Complete
El Cerrito	Pumping Plants	Berryman-North	Complete
El Cerrito	Pumping Plants	Summit-North	Complete
El Cerrito	Pumping Plants	Tewksbury	Complete
El Cerrito	Reservoir Upgrade	Arlington	Complete
El Cerrito	Reservoir Upgrade	Navallier	Complete
El Cerrito	Reservoir Upgrade	Berryman-North	Complete
El Cerrito	Reservoir Upgrade	Tewksbury	Complete
El Sobrante	Fault Crossings	Del Monte / Richmond	Complete
El Sobrante	Fault Crossings	Rollingwood / Bancroft	Complete
El Sobrante	Fault Crossings	El Portal Drive / Fordham	Complete
El Sobrante	Fault Crossings	Alpine / Drake Way	Complete
El Sobrante	Landslide and Liquefaction	Between Sobrante FP and Malone PP	Complete
El Sobrante	Pumping Plants	Argyle	Complete
El Sobrante	Pumping Plants	Greenridge	Complete
El Sobrante	Pumping Plants	Maloney	Complete



cont...

Location	Project	Facility	FY05 Status
El Sobrante	Reservoir Upgrade	Verde	Complete
El Sobrante	Reservoir Upgrade	Sobrante CW	Complete
El Sobrante	Reservoir Upgrade	Argyle No. 1	Complete
El Sobrante	Treatment Plant Upgrades	Sobrante Filter Plant	Complete
Hayward	Building and Equipment Anchorage	Hayward Microwave Station	Complete
Hayward	Pumping Plants	Fairview	Complete
Hayward	Pumping Plants	Quarry	Complete
Hayward	Reservoir Upgrade	Fairview	Complete
Hayward	Reservoir Upgrade	Quarry	Complete
Hayward	Reservoir Upgrade	Walpert	Complete
Hayward	Reservoir Upgrade	Bayview No. 2	Complete
Hayward	Reservoir Upgrade	Bayview No. 1	Complete
Hercules	Pumping Plants	Luzon	Complete
Hercules	Reservoir Upgrade	Mendocino	Complete
Hercules	Reservoir Upgrade	Luzon	Complete
Kensington	Pumping Plants	San Pablo PP	Complete
Kensington	Pumping Plants	Aqueduct	Complete
Kensington	Pumping Plants	Berryman-West	Complete
Kensington	Pumping Plants	Summit-West	Complete
Kensington	Reservoir Upgrade	San Pablo Clearwell	Complete
Kensington	Transmission System Upgrade Project	No. 3 - Fairmount/Ashbury	Complete
Kensington	Treatment Plant Upgrades	San Pablo Filter Plant	Complete
Lafayette	Landslide and Liquefaction	Moraga Rd. near Madrone Dr.	Complete
Lafayette	Pumping Plants	Diablo Vista	Complete
Lafayette	Pumping Plants	Moraga RW PP	Complete
Lafayette	Pumping Plants	Bacon	Complete
Lafayette	Pumping Plants	Bryant No. 2	Complete
Lafayette	Pumping Plants	Echo Springs	Complete
Lafayette	Pumping Plants	Hink	Complete
Lafayette	Pumping Plants	Bryant No. 1	Complete
Lafayette	Pumping Plants	Valory	Complete
Lafayette	Reservoir Upgrade	Brookwood	Complete
Lafayette	Reservoir Upgrade	Diablo Vista	Complete
Lafayette	Reservoir Upgrade	Valley View	Complete
Lafayette	Reservoir Upgrade	Leland	Complete
Lafayette	Reservoir Upgrade	Withers	Complete
Lafayette	Reservoir Upgrade	Grizzly	Complete
Lafayette	Reservoir Upgrade	Rheem	Complete
Lafayette	Reservoir Upgrade	Valory	Complete
Lafayette	Reservoir Upgrade	Echo Springs	Complete
Lafayette	Treatment Plant Upgrades	Lafayette Filter Plant	Complete
Moraga	Building and Equipment Anchorage	Mulholland Microwave Station	Complete
Moraga	Pumping Plants	Arroyo	Complete
Moraga	Pumping Plants	Fay Hill	Complete
Moraga	Pumping Plants	Rheem	Complete
Moraga	Reservoir Upgrade	Carter	Complete
Moraga	Reservoir Upgrade	Donald	Complete
Oakland	Building and Equipment Anchorage	Administration Building	Complete
Oakland	Building and Equipment Anchorage	Oakport Storage	Complete
Oakland	Building and Equipment Anchorage	Central Area Service Center	Complete
Oakland	Building and Equipment Anchorage	Engineering Materials Laboratory	Complete
Oakland	Fault Crossings	39th / Victor	Complete
Oakland	Fault Crossings	73rd / Outlook	Complete
Oakland	Fault Crossings	Lake Temescal Embankment	Complete
Oakland	Fault Crossings	Calaveras Ave.	Complete
Oakland	Fault Crossings	Monterey / Pedestrian U.C.	Complete

Location	Project	Facility	FY05 Status
Oakland	Fault Crossings	Broadway Terr. / Warren Fwy.	Complete
Oakland	Fault Crossings	Lincoln Ave. / Lincoln Way	Complete
Oakland	Fault Crossings	35th Ave. / Jordan	Complete
Oakland	Fault Crossings	Huntington St. at Fair Ave.	Complete
Oakland	Fault Crossings	Peralta Reservoir I/O Line	Complete
Oakland	Fault Crossings	Kuhlne/Sunnymere / Archmont	Complete
Oakland	Fault Crossings	Park Blvd./ Moutain and Monterey	Complete
Oakland	Fault Crossings	Moraga / Thornhill	Complete
Oakland	Fault Crossings	Mountain / La Salle	Complete
Oakland	Fault Crossings	39th and Victor	Complete
Oakland	Fault Crossings	Golf Links / Mountain Blvd. A	Complete
Oakland	Fault Crossings	USL WTP	Complete
Oakland	Fault Crossings	Coolidge Ave.	Complete
Oakland	Fault Crossings	Golf Links / Castlewood	Complete
Oakland	Fault Crossings	Golf Links / Mountain Blvd. A	Complete
Oakland	Fault Crossings	End of Chabot Rd.	Complete
Oakland	Fault Crossings	39th Ave. Reservoir	Complete
Oakland	Landslide and Liquefaction	3300 Butters Dr.	Complete
Oakland	Landslide and Liquefaction	Brunnel Dr. at Joaquin Miller Reservoir	Complete
Oakland	Landslide and Liquefaction	Grand Ave. at El Embarcadero / Brooklyn Ave. at Wesley Ave.	Complete
Oakland	Landslide and Liquefaction	Park Blvd. at Newton Ave. and East 18th St.	Complete
Oakland	Landslide and Liquefaction	26th St. at Valdez	Complete
Oakland	Landslide and Liquefaction	Bay Pl. and Grand Ave.	Complete
Oakland	Landslide and Liquefaction	Contra Costa Rd.	Complete
Oakland	Pumping Plants	Fontaine	Complete
Oakland	Pumping Plants	39th Ave.	Complete
Oakland	Pumping Plants	Bayfair	Complete
Oakland	Pumping Plants	Chabot Raw Water	Complete
Oakland	Pumping Plants	Peralta	Complete
Oakland	Pumping Plants	Carisbrook	Complete
Oakland	Pumping Plants	City Line	Complete
Oakland	Pumping Plants	Country Club	Complete
Oakland	Pumping Plants	Field	Complete
Oakland	Pumping Plants	Gwin	Complete
Oakland	Pumping Plants	Madrone	Complete
Oakland	Pumping Plants	Palo Seco	Complete
Oakland	Pumping Plants	May	Complete
Oakland	Pumping Plants	Montclair	Complete
Oakland	Pumping Plants	Pinehaven	Complete
Oakland	Pumping Plants	Redwood	Complete
Oakland	Pumping Plants	Skyline	Complete
Oakland	Pumping Plants	Strathmoor	Complete
Oakland	Pumping Plants	Joaquin Miller	Complete
Oakland	Reservoir Upgrade	Swainland	Complete
Oakland	Reservoir Upgrade	Burdeck	Complete
Oakland	Reservoir Upgrade	May	Complete
Oakland	Reservoir Upgrade	Thornhill	Complete
Oakland	Reservoir Upgrade	Forest Park	Complete
Oakland	Reservoir Upgrade	USL No. 2 CW	Complete
Oakland	Reservoir Upgrade	Berryman-South	In Progress
Oakland	Reservoir Upgrade	Forestland	Complete
Oakland	Reservoir Upgrade	Joaquin Miller	Complete
Oakland	Reservoir Upgrade	Palo Seco	Complete
Oakland	Reservoir Upgrade	Skyline	Complete
Oakland	Reservoir Upgrade	Dingee	Complete
Oakland	Reservoir Upgrade	Oak Knoll	Complete



cont...

Location	Project	Facility	FY05 Status
Oakland	Reservoir Upgrade	Berkeley View No. 2	Complete
Oakland	Reservoir Upgrade	Stonewall	Complete
Oakland	Reservoir Upgrade	Estates	Complete
Oakland	Reservoir Upgrade	Redwood	Complete
Oakland	Reservoir Upgrade	Berkeley View No. 1	Complete
Oakland	Reservoir Upgrade	Peralta	Complete
Oakland	Reservoir Upgrade	Rilea	Complete
Oakland	Reservoir Upgrade	Coolidge Ave. Automatic Shutoff Valve	Complete
Oakland	Reservoir Upgrade	Upper San Leandro Automatic Shutoff Valve	Complete
Oakland	Reservoir Upgrade	Strathmoor	Complete
Oakland	Reservoir Upgrade	Madrone	Complete
Oakland	Reservoir Upgrade	Field	Complete
Oakland	Transmission System Upgrade Project	No. 6 - Central Reservoir/Central RCS	Complete
Oakland	Treatment Plant Upgrades	Upper San Leandro Filter Plant	Complete
Orinda	Building and Equipment Anchorage	Microwave Stations	Complete
Orinda	Landslide and Liquefaction	Glorietta Blvd. at Moraga Way	Complete
Orinda	Landslide and Liquefaction	Glorietta Blvd. at Meadow View Rd.	Complete
Orinda	Pumping Plants	Los Altos	Complete
Orinda	Pumping Plants	Briones Raw Water No. 1 PP	Complete
Orinda	Pumping Plants	Briones Raw Water No. 2 PP	Complete
Orinda	Pumping Plants	Crossroads	Complete
Orinda	Pumping Plants	Donald	Complete
Orinda	Pumping Plants	Encinal	Complete
Orinda	Pumping Plants	Laguna	Complete
Orinda	Pumping Plants	Las Aromas	Complete
Orinda	Pumping Plants	Orinda WW PP	Complete
Orinda	Pumping Plants	Siesta	Complete
Orinda	Pumping Plants	Sleepy Hollow	Complete
Orinda	Pumping Plants	Baseline	Complete
Orinda	Reservoir Upgrade	Las Aromas	Complete
Orinda	Reservoir Upgrade	Diablo	Complete
Orinda	Reservoir Upgrade	Westside	Complete
Orinda	Reservoir Upgrade	Baseline	Complete
Orinda	Reservoir Upgrade	Happy Valley	Complete
Orinda	Reservoir Upgrade	Glorietta	Complete
Orinda	Reservoir Upgrade	Claremont Tunnel East Portal	Complete
Orinda	Reservoir Upgrade	Los Altos	Complete
Orinda	Reservoir Upgrade	Bryant	Complete
Orinda	Treatment Plant Upgrades	Orinda Filter Plant	Complete
Piedmont	Pumping Plants	Estates	Complete
Piedmont	Pumping Plants	Piedmont	Complete
Piedmont	Reservoir Upgrade	Piedmont	Complete
Piedmont	Transmission System Upgrade Project	No. 5 - Piedmont PP	Complete
Pinole	Pumping Plants	Stott	Complete
Pinole	Pumping Plants	Mendocino	Complete
Pinole	Reservoir Upgrade	Stott	Complete
Pinole	Reservoir Upgrade	Maloney	Complete
Richmond	Building and Equipment Anchorage	North Area Service Center	Complete
Richmond	Landslide and Liquefaction	Carlson Blvd. at Carl Ave. and I-80 Underpass	Complete
Richmond	Landslide and Liquefaction	Carquinez Rd.	Complete
Richmond	Pumping Plants	Pearl	Complete
Richmond	Pumping Plants	Castro	Complete
Richmond	Pumping Plants	Moyers	Complete
Richmond	Pumping Plants	Shawn	Complete
Richmond	Reservoir Upgrade	Richmond	In Progress

Location	Project	Facility	FY05 Status
Richmond	Reservoir Upgrade	Road 24	Complete
Richmond	Reservoir Upgrade	Pearl	Complete
Richmond	Reservoir Upgrade	Nicholl Knob	Complete
Richmond	Reservoir Upgrade	Schapiro	Complete
Richmond	Reservoir Upgrade	Summit North	Complete
Richmond	Transmission System Upgrade Project	No. 2 - Nevin/Key	Complete
Rodeo	Reservoir Upgrade	Selby	Complete
Rodeo	Reservoir Upgrade	Birch	Complete
San Leandro	Reservoir Upgrade	Bayfair	Complete
San Leandro	Transmission System Upgrade Project	No. 6 - Liberty Blvd.	Complete
San Leandro	Transmission System Upgrade Project	No. 7 - Liberty Blvd.	Complete
San Leandro	Transmission System Upgrade Project	No. 8 - Liberty Blvd.	Complete
San Lorenzo	Building and Equipment Anchorage	South Area Service Center	In Progress
San Pablo	Fault Crossings	San Pablo Dam Rd. / Morrow	Complete
San Pablo	Fault Crossings	McClothen Way / Payne	Complete
San Pablo	Fault Crossings	Crockett PP/San Pablo Ave. / Robert Miller	Complete
San Pablo	Pumping Plants	Crockett	Complete
San Pablo	Pumping Plants	Road 24 No. 1	Complete
San Pablo	Pumping Plants	Schapiro	Complete
San Pablo	Reservoir Upgrade	Road 20 RCS	Complete
San Pablo	Transmission System Upgrade Project	No. 1 - Crockett Pumping Plant	Complete
San Pablo	Landslide and Liquefaction	Marin Ave. at Casino	Complete
San Ramon	Fault Crossings	Crow Canyon Rd. / San Ramon Valley Blvd.	Complete
San Ramon	Pumping Plants	Derby	Complete
San Ramon	Reservoir Upgrade	Castenada 1 & 2	Complete
San Ramon	Reservoir Upgrade	Amador	Complete
San Ramon	Reservoir Upgrade	San Ramon Reservoir Automatic Shutoff Valve	Complete
Walnut Creek	Building and Equipment Anchorage	East Area Service Center	In Progress
Walnut Creek	Pumping Plants	Walnut Creek No. 3 Raw Water PP	Complete
Walnut Creek	Pumping Plants	Brookwood	Complete
Walnut Creek	Pumping Plants	Castle Hill	Complete
Walnut Creek	Pumping Plants	Hawthorne	Complete
Walnut Creek	Pumping Plants	Holly	Complete
Walnut Creek	Pumping Plants	Larkey	Complete
Walnut Creek	Pumping Plants	Walnut Creek No. 1 Raw Water PP	Complete
Walnut Creek	Pumping Plants	Walnut Creek No. 2 Raw Water PP	Complete
Walnut Creek	Reservoir Upgrade	Pleasant Hill	Complete
Walnut Creek	Reservoir Upgrade	Tice	Complete
Walnut Creek	Reservoir Upgrade	Colorados	Complete
Walnut Creek	Treatment Plant Upgrades	Walnut Creek Filter Plant	Complete

Building and Equipment Anchorages include any of the following:

- Equipment anchorages
- Structural modifications
- Non-structural modifications

Reservoir Upgrades include any of the following:

- Seismic upgrade of reservoirs
- Installation of grates in open-cut reservoirs
- Anchorage of valve pit roofs
- Seismic isolation valves at reservoirs

Pumping Plants include any of the following:

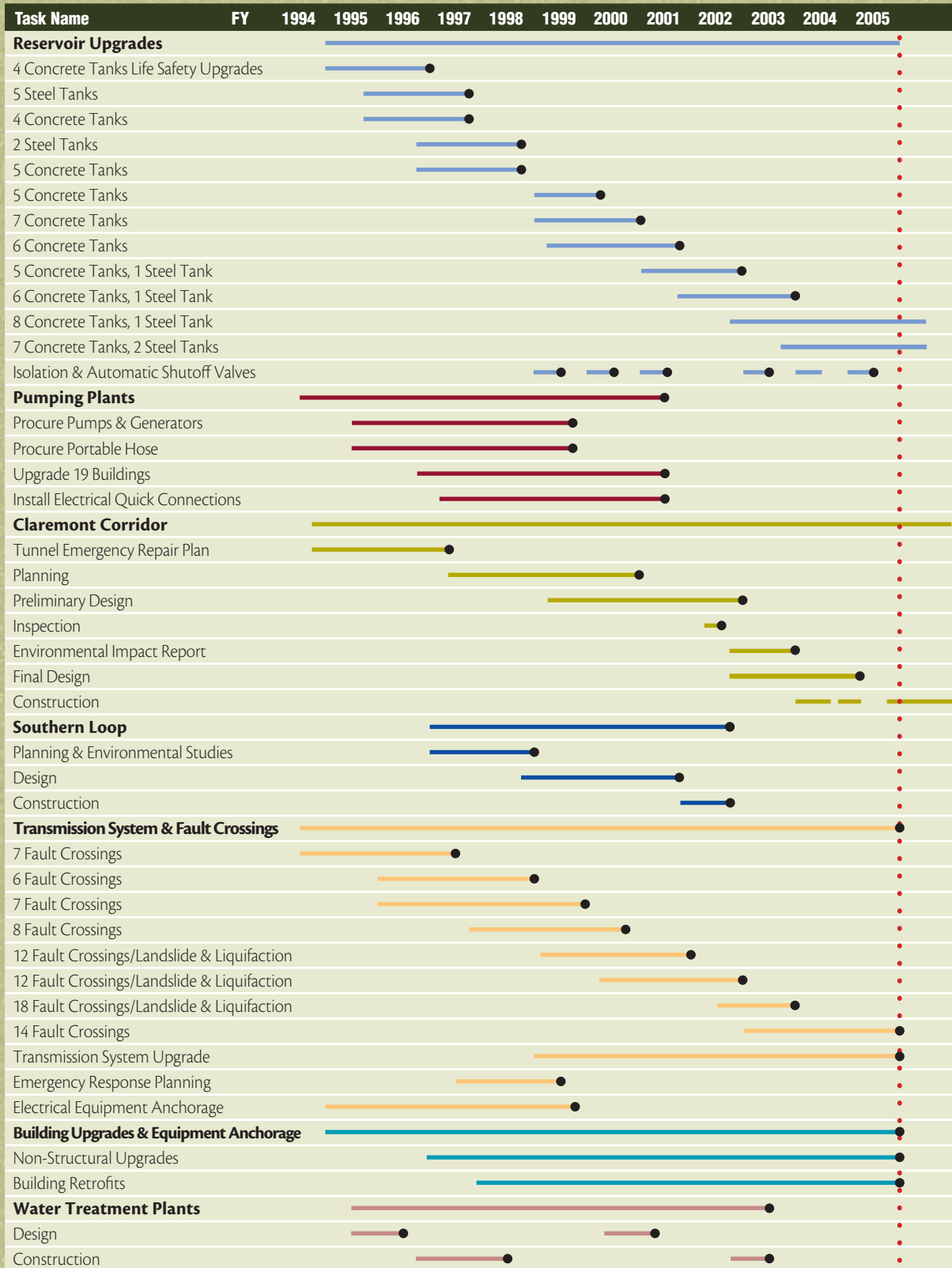
- Equipment anchorages
- Quick connects and hydrants
- Pumping plant building structural upgrades
- Seismic restraint of overhead trolleys

Water Treatment Plant Upgrades include any of the following:

- Equipment anchorages
- Building structural upgrades



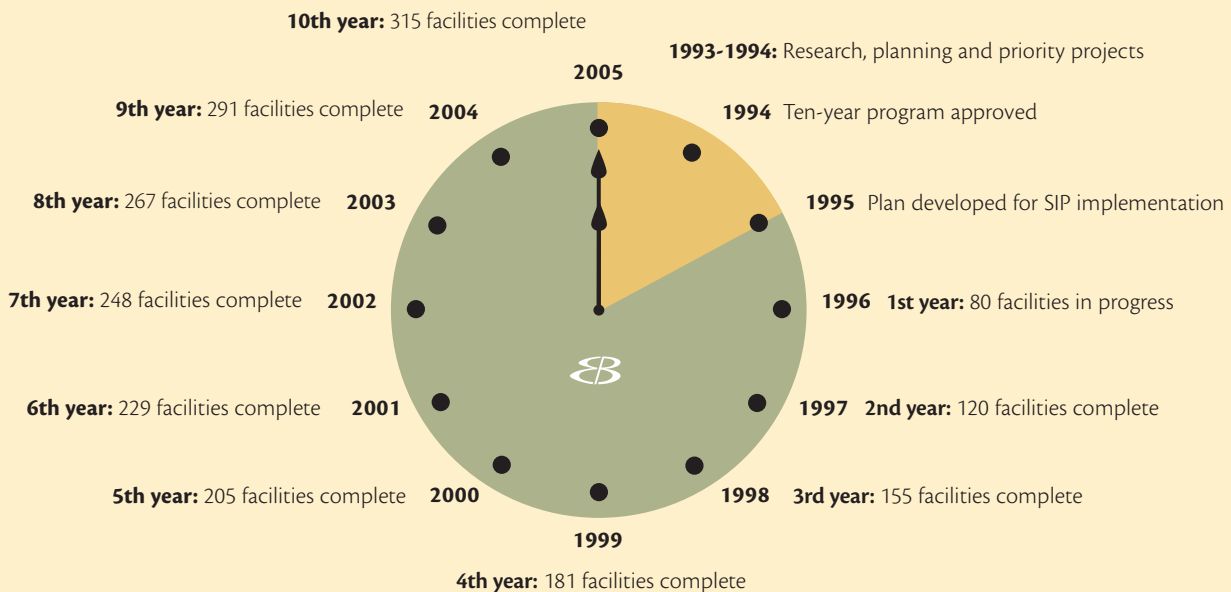
Schedule



● Work Completed

Project	Priority Projects Budget	SIP Budget	Original Seismic Budget	Current Seismic Budget	Total Costs to Date in 93\$	% Spent of Current	% Complete
Reservoir Upgrades	7,185,000	66,400,000	73,585,000	83,773,000	71,459,000	85%	85%
Pumping Plants		4,900,000	4,900,000	5,592,000	5,592,000	100%	100%
Claremont Corridor	1,050,000	25,400,000	26,450,000	59,473,000	33,250,000	56%	56%
Southern Loop		30,500,000	30,500,000	42,875,000	42,875,000	100%	100%
Transmission System & Fault Crossings	4,150,000	49,500,000	53,650,000	23,778,000	23,400,000	98%	90%
Building & Equipment Anchorages	615,000	8,500,000	9,115,000	12,023,000	11,661,000	97%	98%
Water Treatment Plants		3,800,000	3,800,000	4,185,000	4,185,000	100%	100%
Total	13,000,000	189,000,000	202,000,000	231,699,000	192,422,000	83%	90%

*All budget figures are represented in 1993 dollars. It is anticipated that the seismic surcharge revenues will be sufficient to cover the expected total program costs.



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Published by the Seismic Improvement Program

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