



# East Branch Extension Moves Forward

By Jennifer Iida

It's been a long time coming, but engineering projects are finally underway to bring the full allotment of State Water Project water to the San Geronio Pass Water Agency.

The projects on the East Branch Extension of the California Aqueduct also will allow the San Bernardino Valley Municipal Water District to deliver additional SWP water to its Yucaipa Valley service area.

"This will be a major DWR accomplishment," said **Richard Sanchez**, Chief of the Division of Engineering.

"The East Branch Extension leg of the State Water Project is being expanded to provide an increase in the system's flow capacity and reliability to meet the growing water demands of the San Bernardino, Mentone, Redlands, Yucaipa, Cherry Valley, Beaumont, and San Geronio communities," Sanchez noted.

State Water Project water also will reduce supply demands on groundwater basins.

The San Geronio Pass Water Agency (SGPWA) became a State Water Project contractor in 1962, but didn't receive SWP water until completion of Phase I of the East Branch Extension in 2003.

Phase I brought Lake Oroville water via the California Aqueduct to the San Bernardino Valley Municipal Water District's (SBVMWD) Yucaipa Valley service area in San Bernardino County and the SGPWA in Riverside County's



**Above:** Contractors working on Yucaipa Connector Pipeline Valve Vault I in February of 2011. **Right:** (Left to Right) EBX Project Manager Ted Craddock meets with EBX Engineering Team Members Dave Otto, Damon Grimes, Zerguy Maazouddin, Dawn Remme, and Matt Kasjaka.

*“Work on Phase II began in 2005 about 15 years earlier than originally planned. Initial planning activities were focused on the size and location of Citrus Reservoir and evaluation of 10 pipeline alignments to convey water from the existing Foothill Pipeline to Crafton Hills Pump Station.”*

**Ted Craddock**  
EBX Project Manager



EBX Project Manager Ted Craddock

Cherry Valley. (The SBVMWD was already receiving SWP water from Lake Silverwood via the East Branch of the California Aqueduct.)

East Branch Extension Phase I (EBX I) is a 33-mile long pipeline conveyance system that carries water from Devil Canyon Powerplant Afterbay's Foothill Pipeline to Yucaipa, Calimesa, Beaumont, Banning and other communities in Riverside and San Bernardino counties, more than 450 miles from the source of the SWP water in Lake Oroville.

Engineers realized when building EBX I that some of the infrastructure it used, previously constructed by the SBVMWD, limited water deliveries to the SGPWA. Hence EBX II: six additional miles of pipe; a new 400 acre-foot reservoir (Citrus Reservoir); a 160 cubic foot per second (cfs) pump station (Citrus Pump Station), expansion of the existing Crafton Hills Pump Station from 60 to 135 cfs, and an additional pump at the existing Cherry Valley Pump Station to increase capacity from 32 to 52 cfs.

Phase II will double the SGPWA's SWP deliveries to 17,300 acre-feet a year.

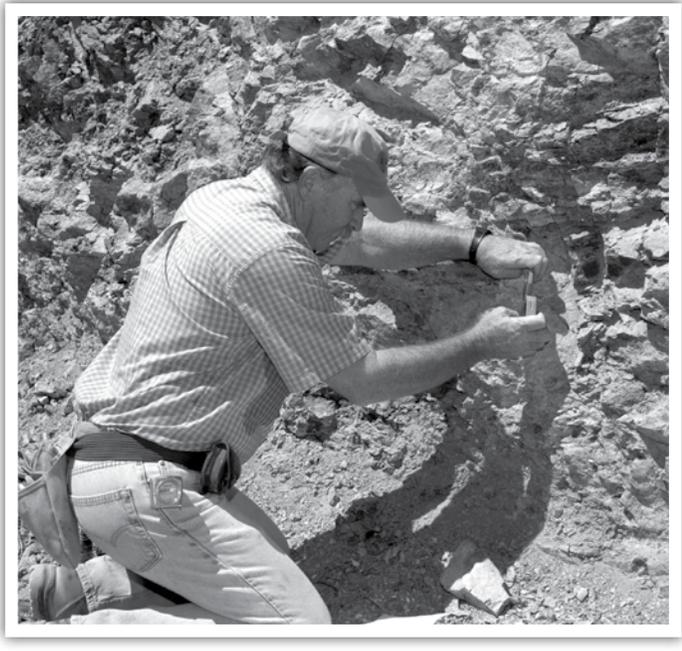
“Soon after completion of Phase I, SBVMWD and SGPWA requested DWR begin project formulation and planning studies for Phase II,” said **Ted Craddock**, EBX Project manager.

“Work on Phase II began in 2005 about 15 years earlier than originally planned,” Craddock said. “Initial planning activities were focused on the size and location of Citrus Reservoir and evaluation of 10 pipeline alignments to convey water from the existing Foothill Pipeline to Crafton Hills Pump Station.”

As Phase II is underway, so also is the East Branch Extension – Phase I Improvements Project. This work dovetails to increase the operating storage capacity of the existing Crafton Hills Reservoir from 85 acre-feet to 225 acre-feet. This will enhance the system's operational flexibility and reliability, and reduce on-peak energy demands. Also, a half-mile-long, 42-inch diameter pipeline will connect the existing EBX pipeline with the existing Yucaipa Pipeline. The pipeline will bypass the reservoir to allow continued deliveries while the reservoir is being enlarged. It also will be used during future outages of the reservoir.

“The (reservoir size) increase is a huge benefit because currently there is a small margin of error in the system,” said Craddock. “If a valve needs repair on the pipeline upstream of the reservoir, you're out of water within a day. The additional storage will provide at least a couple of days to fix the problem or shift to backup water supplies.”

The East Branch Extension projects – including Phase I, Phase I Improvements, and Phase II – exemplify sound



*In 2008, Project Geology Geologist Ted Bruce uses compass to measure strike and dip of foliation in exploration dozer trench for EBX-Phase I Improvements at Crafton Hills Reservoir.*

planning to expand projects as dictated by service needs.

Phase I, completed in 2003, delivers half of the SGPWA'S contracted water for recharge of groundwater basins in Beaumont and Cherry Valley. The phase I system also delivers water to SBVMWD's Yucaipa Valley Service area.

Phase I Improvements, at an estimated cost of \$20 million, interlock with Phase II, which DWR began planning in 2005.

Improvements Project work, begun early this year, to date has included fabrication of pipe sections, construction of the vaults at the connections to existing pipelines, and installation of portions of the Yucaipa connector pipeline. Also, Highway 38 had to be detoured around the work area. Pipeline construction is scheduled to be completed in July, prior to work on the Crafton Hills Reservoir enlargement, which includes

construction of a second, 100-foot-tall dam in a ravine west of the existing dam.

All work on Phase I Improvements and Phase II is scheduled to be completed by late 2014.

### **Preserving Valuable Natural Resources**

The Crafton Hills area is a labyrinth of scenic hiking trails utilized by scores of nature enthusiasts. During planning of the Phase I Improvements Project, environmental studies were conducted to evaluate impacts to aesthetics, air quality, biology, cultural resources, geology, hazardous materials, hydrology, land use, noise and vibration, public service and utilities, and transportation and traffic.

Mitigation measures were developed to minimize impacts. Another impact identified by DWR is the loss of open space where the new dam and reservoir will be located. As a result, DWR is committed to acquiring a similar amount of open space within the Crafton Hills and is working with a local conservancy to identify suitable property.

### **Phase II on the Horizon**

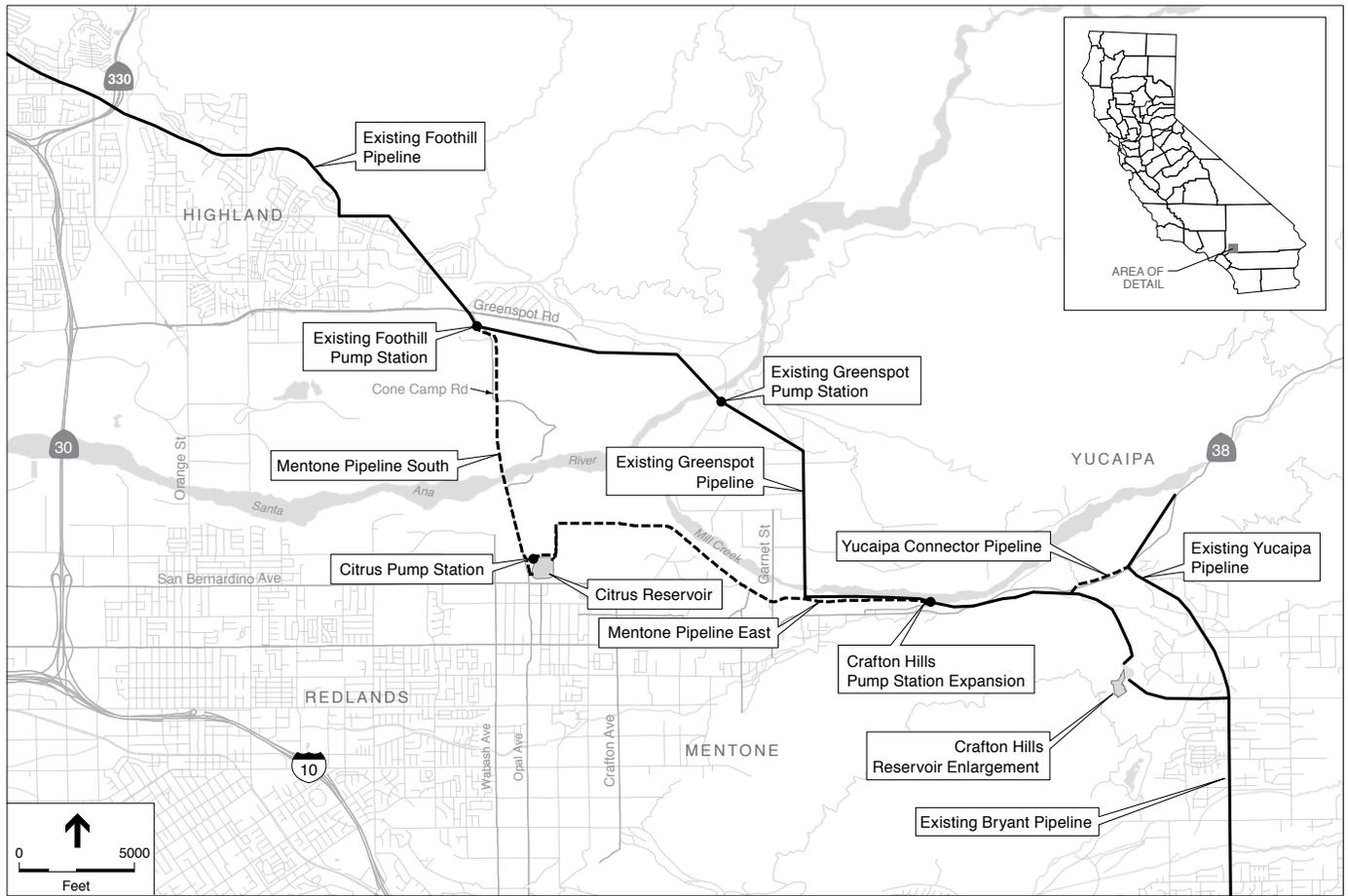
Phase II construction of the Mentone Pipeline and Citrus Reservoir will begin late this year.

"The thing that is exciting about this is more than 100 staff throughout DWR have been working on this project (Phase II)



*Rich Brewer (right) of Lancaster Project Headquarters reviews Yucaipa connector pipeline plans with contractor.*

## EAST BRANCH EXTENSION PHASE I IMPROVEMENTS AND PHASE II



**Above:** Crafton Hills Reservoir enlargement dam site  
**Right:** Rich Brewer of Lancaster Project Headquarters at construction of Yucaipa connector pipeline.



for the last five years and now it's finally all coming together," said Craddock.

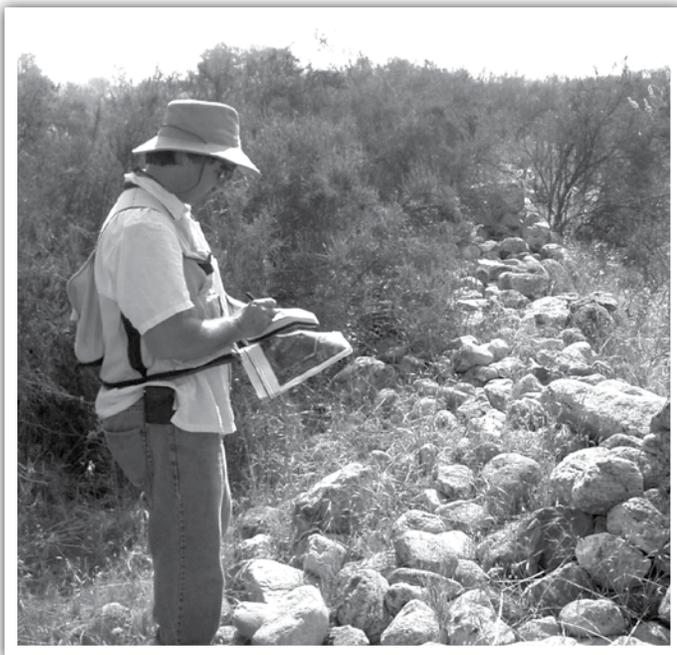
One of the highlights of Phase II will be at the Citrus Pump Station, where eight pumps will lift water 715 feet to a new forebay tank at Crafton Hills Pump Station.

Occupying a footprint of 160 feet by 80 feet with a building height of 40 feet, the Citrus Pump Station will have motors ranging in size from 1,250 to 2,750 horsepower. Citrus Reservoir with a storage capacity of 400 acre-feet and a surface area of about 18 acres, will act as a forebay for Citrus Pump Station and will be filled from the south segment of Mentone Pipeline.

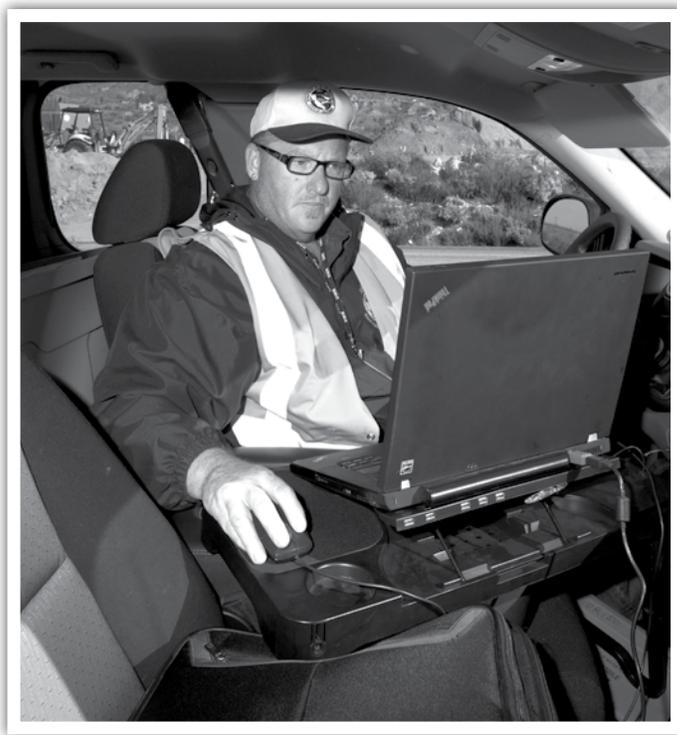
Mentone Pipeline's southern segment, which starts at the existing Foothill Pipeline and will end at Citrus Reservoir, will include about two miles of 72-inch diameter steel pipe with a capacity of 175 cfs. The south segment of the pipeline will also cross the Santa Ana River wash and will be placed 40 feet below the ground surface at the main channel of the Santa Ana River to ensure the pipeline is not affected by high flows in the river.

The eastern segment, which will start at Citrus Pump Station and will terminate at Crafton Hills Pump Station will include about four miles of 66-inch diameter steel pipe with a capacity of 160 cfs.

Citrus Pump Station will require about 20 megawatts of



*(Photo by Mark Pagenkopp) Geologist Don Hoirup of DOE's Project Geology Section in the Geotechnical and Structures Branch performing geologic reconnaissance along the EBX-Phase II Mentone Pipeline alignment.*



*Dave Sale, Assistant Chief of Lancaster Project Headquarters, works from his mobile office at the Yucaipa connector pipeline site.*

energy to power the eight pumps. As a result, DWR is working with Southern California Edison to build new transmission and interconnection facilities and execute agreements to purchase power. Edison plans to tap a 115 kilovolt power line located about 1,000 feet away from Citrus Pump Station to bring power to the site.

## Environmental Studies for Phase II

Environmental studies were also conducted to evaluate impacts resulting from the Phase II project. These studies identified the possible presence of four threatened and endangered species within the pipeline construction area. The species include the San Bernardino Kangaroo Rat, Coastal California Gnatcatcher, Santa Ana River Woollystar, and Slender-Horned Spineflower.

To mitigate the project's impacts on these species, a 33-acre mitigation property has been acquired within the Santa Ana River Wash. The property currently is occupied with San Bernardino Kangaroo Rat and Coastal California Gnatcatcher. DWR has committed to performing periodic vegetation clearing to maintain the habitat value in the future.

DWR is also working cooperatively with the United States Fish and Wildlife Service to develop a plan to restore and enhance the pipeline construction corridor where it crosses the



*Lancaster Project Headquarters staff*

Woolly Star Preservation Area (WSPA). The WSPA is a conservation easement established for the nearby Seven Oaks Dam. Enhancements to the WSPA include spreading natural material from the Citrus Reservoir excavation over the pipeline construction corridor to make surface soils more suitable for San Bernardino Kangaroo Rat.

### **A Dedicated Team**

“Implementing projects as large as the East Branch Extension requires the dedicated and tireless efforts of DWR employees,” said Craddock.

The Division of Engineering (DOE) is responsible for overall management of the planning, design, and construction. DOE’s Civil Engineering Branch; Geotechnical and Structures Branch; and Mechanical and Electrical Engineering Branch are responsible for the engineering design with the Administrative



*EBX Engineering Team Members during March 2011 meeting*

Services Branch providing administrative support. The Real Estate Branch is responsible for property acquisition, while the Geodetic Branch provides topographic surveys that support real estate, design and construction efforts.

In the Construction Branch, there is currently a staff of approximately 90 employees within five sections and headquarters which include the Contract Development Section, Planning and Scheduling

Section, Equipment and Materials Section, Lancaster Project Headquarters, Sacramento Project Headquarters and Levee Repair Project Headquarters.

“Our group is responsible for advertising, bidding, awarding, and administering construction contracts issued by the DWR,” said **Robert Fill**, Chief of DOE’s Construction Branch.

The Lancaster Project Headquarters employs about 10 people and that number is expected to climb during Phase II. They are responsible for administering construction contracts for the southern region of the state.

In addition to DOE staff, several DWR divisions are collaborating on the projects as members of the overall project team.

Environmental studies and compliance activities are being managed by Southern Region Office with support from the Division of Environmental Services for specific analyses such as cultural and hazardous

material assessments. DOE along with Southern Region and the Office of Chief Counsel prepared the Environmental Impact Reports. The State Water Project Analysis Office is responsible for developing the proportional use factors and agreements with SBVMWD and SGPWA. The SWP Power and Risk Office is responsible for developing agreements with Southern California Edison for long-term power supply and construction of the transmission and interconnection facilities for the pump stations.

The Division of Operations and Maintenance Headquarters and Southern Field Division, SBVMWD, and SGPWA also perform important roles providing input and review of the long-term operation scenarios and facility designs. They will ultimately be involved with operating and maintaining the new facilities. In addition, O&M staff is involved in outages and operational tests of the system.

“It’s satisfying to know the water we provide will serve several communities and help ensure thousands of people have water to live their lives and conduct business to benefit the economy of California,” said Craddock.



*With the city of Yucaipa in the background, DWR Geologist Mike Purcell logs core CHE-10 drill site.*



*At Cranton Hills Reservoir enlargement dam site, Project Geology Geologist John Curless logging drill core from exploration drill hole. Background: Drilling rig at site.*

