THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- Board of Directors
  Engineering and Operations Committee

8/19/2014 Board Meeting

7-4

Subject

Appropriate $1.68 million; and authorize three rehabilitation projects at the Joseph Jensen Water Treatment Plant (Approps. 15486 and 15442)

Executive Summary

This action authorizes three projects at the Joseph Jensen Water Treatment Plant which will: (1) refurbish the roof on Finished Water Reservoir No.1; (2) upgrade the chemical feed system controls; and (3) provide electrical reliability for critical treatment processes.

Timing and Urgency

The chemical feed systems, finished water reservoirs, and electrical unit power centers (UPCs) are critical components of the Jensen plant's water treatment process. Improvements are needed at the plant to maintain plant reliability, enhance safety, and comply with water quality regulations.

These projects have been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria and are categorized as Infrastructure Rehabilitation projects. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2014/15.

Details

Background

The Jensen plant was placed into service in 1972 with an initial capacity of 400 million gallons per day (mgd), and was expanded in the early 1990s to its current capacity of 750 mgd. The Jensen plant treats water from the West Branch of the State Water Project and delivers it to Metropolitan's Central Pool and to exclusive service areas on the west side of the distribution system. The facility is located in Granada Hills.

The Jensen plant uses a multistep water treatment process consisting of pre-oxidation and disinfection with ozone, coagulation, flocculation, sedimentation, granular media filtration, and disinfection. Plant inlet flow meters and water quality analyzers are used to control chemical addition throughout the plant. In addition to the coagulation and disinfection chemicals, caustic soda and sodium hypochlorite are used to control pH and biomass growth in the filters, respectively. Following the filtration process, drinking water is stored in two 50-million-gallon finished water reservoirs.

To efficiently meet water treatment goals, Metropolitan staff performs regular maintenance on the plant's mechanical and electrical equipment. Although the Jensen plant continues to perform reliably today, some of its facilities are aging and require upgrades to maintain plant reliability and enhance worker safety.

Project No. 1 – Finished Water Reservoir Roof Refurbishment – Preliminary Design Phase ($190,000)

The Jensen plant has two 50-million-gallon finished water reservoirs. Reservoir No. 1 is a concrete structure with a concrete roof that was built in 1972. Reservoir No. 2 is asphalt-lined with a polypropylene floating cover that was added in 1995. The concrete roof of Reservoir No. 1 has a bituminous built-up roofing system and lightweight concrete cap made of perlite. The lightweight concrete cap has deteriorated over time due to

weathering. Any further deterioration may result in ponded rainwater leaking into the reservoir, leading to reduction in the plant's finished water storage capacity in order to maintain treated water quality. Staff recommends proceeding with preliminary design to replace the 260,000-square-foot perlite cap with a longer-lasting, resilient roofing system. Planned activities include field surveys; assessment and structural evaluation of alternate roofing systems; hazardous materials testing; and development of final design criteria and a preliminary cost estimate.

This action appropriates $190,000 and authorizes preliminary design activities to provide a new roofing system for Finished Water Reservoir No. 1. All work will be performed by Metropolitan staff. Requested funds include $117,000 for the above-noted technical analyses and preparation of a preliminary design report; $49,000 for field surveys, permitting, and project management; and $24,000 for remaining budget.

Project No. 2 – Chemical Feed Control Upgrades – Design Phase ($930,000)

Several components of the Jensen plant's water quality monitoring and chemical feed control systems need to be upgraded to maintain the reliability of chemical addition. These components include the raw water quality and flow monitoring equipment, the caustic soda control system, and the sodium hypochlorite control system.

The raw water quality analyzers and flow meters are used to control the addition of treatment chemicals and provide water balance information. The existing inlet instrumentation is currently located on the exterior of the plant inlet structure, where it is exposed to extreme ambient conditions. Inaccurate readings for raw water quality constituents, plant flows, and service connection meters have been observed, and some of the equipment has begun to fail due to exposure. Timely and accurate water quality monitoring results are needed to properly control treatment processes and to monitor regulated constituents. Poor flow readings can result in inaccurate water balance and water sales data.

At the Jensen plant, caustic soda is added both downstream of the ozone contactors and upstream of the finished water reservoirs to provide pH control. At the present time, caustic soda feed equipment is housed in an uninsulated metal building located within the chemical tank spill containment area. The existing caustic metering and control equipment is 40 years old, and its current floor level is below the elevation of a future chemical containment wall. In the event of a leak, this facility would become flooded.

The Jensen filters are currently operated as biologically active filters. Their biomass is controlled by backwashing with chlorinated water, which is accomplished by injecting sodium hypochlorite into the backwash water. The existing sodium hypochlorite delivery system includes two storage tanks, pumps, metering valves, and flow control for each filter module. Several leaks have occurred in the sodium hypochlorite feed system within the last year. The system needs to be upgraded to improve reliability, prevent leakage, and enhance worker safety.

The planned upgrades include addition of an enclosure to protect the raw water quality and flow monitoring equipment; addition of a new caustic control facility to house electrical and control equipment; relocation of the existing caustic soda pumps to a raised foundation above the future containment wall elevation; and rehabilitation of the sodium hypochlorite delivery system. The upgrades must be executed in sequential stages so the chemical feed systems can remain in operation as the work takes place.

This action appropriates $930,000 and authorizes design to upgrade the chemical feed control systems at the Jensen plant. Planned activities include conceptual layout of the improvements; preparation of drawings and specifications; development of a construction cost estimate; and receipt of competitive bids. All work will be performed by Metropolitan staff.

Requested funds include $194,000 for preliminary design and hydraulic modeling, hazardous materials testing, potholing and geotechnical investigations, surveying, documentation of control system operation, and development of a preliminary cost estimate; $395,000 for final design; $179,000 for bidding and project management; and $162,000 for remaining budget. The final design cost as a percentage of the estimated construction cost is approximately 14.8 percent. Engineering Services' goal for design of projects with construction cost less than $3 million is 9 to 15 percent. The construction cost for this project is anticipated to range from $2.3 million to $2.9 million.

The total estimated cost to complete the Chemical Feed Control Upgrades, including the current funds requested and future construction cost, is anticipated to range from $3.1 million to $3.7 million.

Project No. 3 – UPC-7 Reliability Upgrade– Construction ($560,000)

The Jensen plant's electrical system was initially designed with a radial configuration, with power running through a single path to each local UPC for distribution to powered equipment. The practice of powering all the components of a critical system from a single electrical source does not provide backup or reliability, and leaves the plant vulnerable to an unplanned outage caused by a single failure in the power system. This single-point-of-failure characteristic will be addressed in the Jensen plant's electrical upgrades project by splitting the power supply and replacing UPCs to improve reliability. In July 2013, Metropolitan's Board authorized final design of the Stage 1 Electrical Upgrades. Final design is planned to be completed in late 2015 and construction is scheduled to be completed in 2017.

Metropolitan staff has recently identified the near failure of a key circuit breaker in UPC-7, along with damage to the bus bar within the UPC. This breaker is the sole source of power for several critical equipment items: the service water pumps, which are essential to supply filtered water for chlorine disinfection and for carrier water for the chemical feed systems; the washwater supply pumps; the emergency generator fuel pumps; and 75 percent of the filters. Staff has replaced the breaker with a spare unit, while the original equipment manufacturer is assessing the UPC's bus damage.

Staff recommends that a new substation be procured and installed to provide a second source of power for the above-noted equipment, in order to mitigate the risk of a single electrical failure that could jeopardize the plant's treatment and disinfection capability. Installation of a new substation at this time will improve reliability during the interim period until the plant's full-scale electrical upgrades are completed. This work will be consistent with the planned full-scale upgrades.

This action appropriates $560,000 and authorizes procurement and installation of a new substation to power UPC-7 at the Jensen plant. The procurement contract is planned to be awarded under the General Manager's Administrative Code authority to award contracts of less than $250,000. The requested funds include $230,000 for equipment; $180,000 for installation by Metropolitan forces; $90,000 for preparation of equipment specifications, project management, and receipt of bids; and $60,000 for remaining budget. This work is a component of the Jensen Stage 1 Electrical Upgrades project, whose final design was authorized by Metropolitan's Board in July 2013. The cost of final design for the Stage 1 electrical upgrades is approximately 11.9 percent of the estimated total construction cost. The total construction cost for the Stage 1 electrical upgrades is anticipated to range from $23 million to $25 million.

The estimated cost to complete the Stage 1 electrical upgrades, including the amount expended to date, current funds requested, and future construction costs, is anticipated to range from $32 million to $34 million.

Summary

This action appropriates $1.68 million and authorizes three rehabilitation projects at the Jensen plant. These projects have been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available in the fiscal year 2014/15 capital expenditure plan. See **Attachment 1** for the Financial Statements and **Attachment 2** for the Location Map.

Projects Nos. 1 and 2 are included within capital Appropriation No. 15486, the Jensen Improvements Appropriation – FY 2012/13 Through FY 2017/18, which was initiated in fiscal year 2012/13. With the present action, the total funding for Appropriation No. 15486 will increase from $255,000 to $1,375,000.

The Jensen Electrical Upgrades is included within capital Appropriation No. 15442, the Jensen Improvements Appropriation – FY 2006/07 Through FY 2011/12, which was initiated in fiscal year 2006/07. With the present action, the total funding for Appropriation No. 15442 will increase from $29,016,000 to $29,576,000.

Project Milestones

December 2014 – Completion of installation of the UPC-7 power substation

March 2015 – Completion of preliminary design of the Finished Water Reservoir No. 1 roof

July 2015 – Completion of design of the chemical feed control systems upgrades

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

Project No. 1 – Finished Water Reservoir Roof Refurbishment – Preliminary Design Phase

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed activity will consist of basic data collection and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded. Accordingly, the proposed action qualifies for a Class 6 Categorical Exemption (Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

Project No. 2 – Chemical Feed Control Upgrades – Design Phase

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, design, and minor alterations, reconstruction or replacement of existing public facilities along with the construction of minor appurtenant structures with negligible or no expansion of use and no possibility of significantly impacting the physical environment. In addition, the proposed action involves minor modifications in the condition of land and/or vegetation that do not involve removal of healthy, mature, scenic trees. Accordingly, the proposed action qualifies for Class 1, Class 2, Class 3, Class 4, and Class 11 Categorical Exemptions (Sections 15301, 15302, 15303, 15304, and 15311 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under six Categorical Exemptions (Class 1, Section 15301; Class 2, Section 15302; Class 3, Section 15303; Class 4, Section 15304; and Class 11, Section 15311 of the State CEQA Guidelines).

Project No. 3 – UPC-7 Reliability Upgrade – Construction

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed project involves the funding and minor alterations of existing private or public facilities, along with the construction of minor appurtenant structures, with minor modifications in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees. These activities would result in negligible expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 3, and Class 4 Categorical Exemptions (Sections 15301, 15303, and 15304 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301; Class 3, Section 15303; and Class 4, Section 15304 of the State CEQA Guidelines).

CEQA determination for Option #2:

Projects No. 1 and No. 2

None required

Project No. 3 – UPC-7 Reliability Upgrade – Construction

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed project involves the funding and minor alterations of existing private or public facilities, along with the construction of minor appurtenant structures, with minor modifications in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees. These activities would result in negligible expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 3, and Class 4 Categorical Exemptions (Sections 15301, 15303, and 15304 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301; Class 3, Section 15303; and Class 4, Section 15304 of the State CEQA Guidelines).

CEQA determination for Option #3:

None required

Board Options

Option #1

Adopt the CEQA determinations that the proposed actions are categorically exempt, and

a. Appropriate $1.68 million; and
b. Authorize three rehabilitation projects at the Jensen plant.

Fiscal Impact: $1.12 million of capital funds under Approp. 15486, and $560,000 in capital funds under Approp. 15442.

Business Analysis: These projects are needed to maintain Jensen plant reliability and meet water quality goals.

Option #2

Adopt the CEQA determination that the proposed action is categorically exempt, and

a. Appropriate $560,000;
b. Authorize construction to install a new power substation for Jensen UPC-7; and
c. Do not authorize design to rehabilitate the Finished Water Reservoir No. 1 and the chemical feed systems.

Fiscal Impact: $560,000 of capital funds under Approp. 15442.

Business Analysis: This option would help reduce the risk that a single electrical failure could lead to an unplanned outage. This option would forgo an opportunity to improve reliability of other critical components of the Jensen plant's water treatment process.

Option #3

Do not proceed with the three projects at this time.

Fiscal Impact: None

Business Analysis: This option would forgo an opportunity to enhance Jensen plant reliability.

Staff Recommendation

Option #1

7/25/2014
Date

Gordon Johnson
Manager/Chief Engineer,
Engineering Services

8/5/2014
Date

Jeffrey Kightlinger
General Manager

Attachment 1 – Financial Statements

Attachment 2 – Location Map

Ref# es12631515

Financial Statement for Jensen Improvements Appropriation – FY 2006/07 Through FY 2011/12

A breakdown of Board Action No. 2 for Appropriation No. 15486 for two rehabilitation projects at the Jensen Plant[1] is as follows:

	Previous Total Appropriated Amount (May 2013)	Current Board Action No. 2 (Aug. 2014)	New Total Appropriated Amount
Labor			
Studies & Investigations	$ 28,000	$ 292,000	$ 320,000
Final Design	47,000	352,000	399,000
Owner Costs (Program mgmt., bidding)	68,000	228,000	296,000
Submittals Review & Record Drwgs	-	-	-
Construction Inspection & Support	-	-	-
Metropolitan Force Construction	-	-	-
Materials & Supplies	-	3,000	3,000
Incidental Expenses	2,000	14,000	16,000
Professional/Technical Services	80,000	-	80,000
Materials Testing	-	10,000	10,000
Value Engineering	-	35,000	35,000
Equipment Use	-	-	-
Contracts	-	-	-
Remaining Budget	30,000	186,000	216,000
Total	**$ 255,000**	**$ 1,120,000**	**$ 1,375,000**

Funding Request

Appropriation Name:	Jensen Improvements Appropriation – FY 2012/13 Through FY 2017/18		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15486	**Board Action No.:**	2
Requested Amount:	**$** 1,120,000	**Budget Page No.:**	131
Total Appropriated Amount:	**$** 1,375,000	**Total Program Estimate**:	$6,800,000

[1]This action is the intial appropriation to refurbish the roof on Finished Water Reservoir No.1 and upgrade the chemical feed control systems. The total estimated cost to complete these projects, including the current funds requested and future construction cost, is anticipated to range from $4.9 million to $5.5 million.

Financial Statement for Jensen Improvements Appropriation – FY 2006/07 Through FY 2011/12

A breakdown of Board Action No. 13 for Appropriation No. 15442 to replace UPC-7 at the Jesen plant[1] project is as follows:

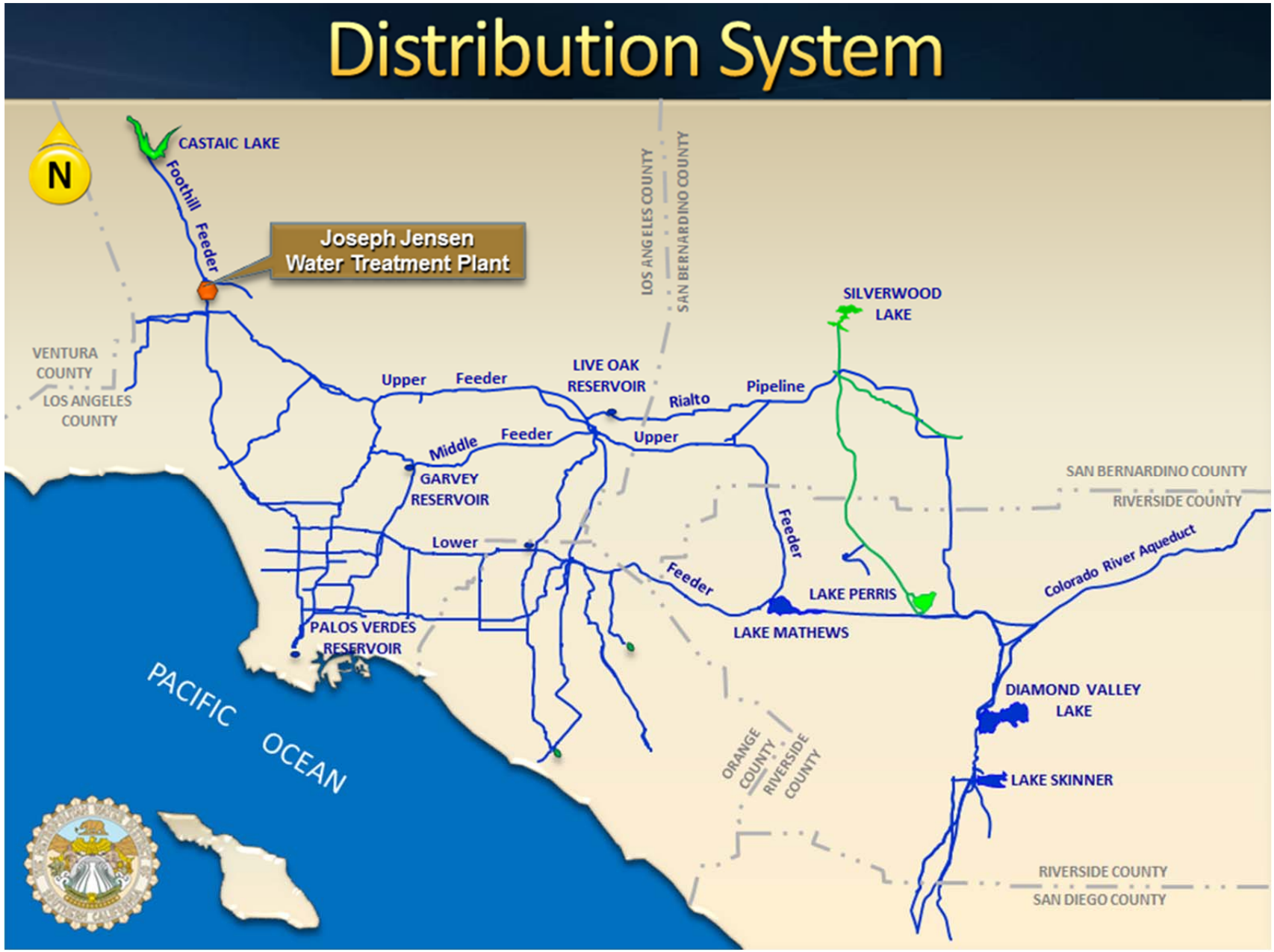
	Previous Total Appropriated Amount (Mar. 2014)	Current Board Action No. 13 (Aug. 2014)	New Total Appropriated Amount
Labor			
Studies & Investigations	$ 1,195,495	$ -	$ 1,195,495
Final Design	4,587,800	60,000	4,647,800
Owner Costs (Program mgmt., bidding)	1,665,963	30,000	1,695,963
Submittals Review & Record Drwgs	536,000	-	536,000
Construction Inspection & Support	1,864,500	-	1,864,500
Metropolitan Force Construction	1,951,033	130,000	2,081,033
Materials & Supplies	657,341	20,000	677,341
Incidental Expenses	106,500	30,000	136,500
Professional/Technical Services	518,454	-	518,454
Equipment Use	19,000	-	19,000
Contracts	13,914,278	230,000	14,144,278
Remaining Budget	1,999,636	[2] 60,000	2,059,636
Total	**$ 29,016,000**	**$ 560,000**	**$ 29,576,000**

Funding Request

Appropriation Name:	Jensen Improvements Appropriation – FY 2006/07 Through FY 2011/12		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15442	**Board Action No.:**	13
Requested Amount:	**$** 560,000	**Budget Page No.:**	128
Total Appropriated Amount:	**$** 29,576,000	**Total Program Estimate:**	$84,700,000

[1]The UPC-7 Power Reliability Upgrade is a component of the Jensen Electrical Upgrades. The amount expended to date on the electrical upgrades is approximately $1.8 million. The total estimated cost to complete the Stage 1 electrical upgrades, including the amount expended to date, current funds requested, and future construction costs, is anticipated to range from $32 million to $34 million.

[2]Includes reallocation of $4,518 from Remaining Budget for completion of the Chemical Trench Extension project.


Distribution System
N
CASTAIC LAKE
Foothill Feeder
Joseph Jensen
Water Treatment Plant
LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
SILVERWOOD
LAKE
VENTURA
COUNTY
LOS ANGELES
COUNTY
Upper Feeder
LIVE OAK
RESERVOIR
Rialto Pipeline
Middle Feeder
Upper
GARVEY
RESERVOIR
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
Lower
Feeder
Feeder
Colorado River Aqueduct
LAKE PERRIS
PALOS VERDES
RESERVOIR
LAKE MATHEWS
PACIFIC
OCEAN
DIAMOND VALLEY
LAKE
ORANGE
COUNTY
RIVERSIDE
COUNTY
LAKE SKINNER
RIVERSIDE COUNTY
SAN DIEGO COUNTY