THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  Engineering and Operations Committee

6/8/2010 Board Meeting

7-2

Subject

Appropriate $420,000; and authorize four distribution system rehabilitation projects (Approp. 15441)

Description

This action authorizes four pipeline protection projects within Metropolitan's distribution system: preliminary design of stray current drain stations for the Allen-McColloch pipeline, the Sepulveda Feeder, and the Second Lower Feeder; and final design of a stray current drain station for the Calabasas Feeder.

Timing and Urgency

Recent corrosion surveys of the Allen-McColloch Pipeline (AMP), Sepulveda Feeder, Second Lower Feeder, and Calabasas Feeder indicate that these prestressed concrete cylinder pipelines (PCCP) are experiencing stray current-induced corrosion damage. Further deterioration of the pipelines may lead to eventual leakage and possible rupture. Stray current drain stations are a proactive and cost-effective measure to protect against further corrosion, and would reduce costly emergency repairs. Given the importance of these pipelines in delivering treated water to Metropolitan's member agencies, staff recommends moving forward with these four projects at this time.

These projects have been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and are categorized as Infrastructure Rehabilitation projects. Each project is budgeted within Metropolitan's CIP for fiscal year 2009/10, and is included in the reprioritized capital budget for fiscal year 2010/11.

Background

Buried metal pipelines are often protected from corrosive soils by the installation of cathodic protection systems. These systems can in turn cause corrosion of adjacent pipelines through the introduction of stray currents into the surrounding soil. Stray currents may flow onto adjacent pipelines in one area, travel along the pipeline, and then leave the pipe (with resulting corrosion) to re-enter the earth. These induced stray currents are known to cause corrosion and may cause significant loss of metal.

To mitigate stray currents within the distribution system, Metropolitan staff regularly monitors pipelines and installs stray current drains on PCCP when stray currents are detected. The stray current drains provide a magnesium or zinc anode, buried in soil adjacent to the pipeline, as a preferential discharge path for the stray current, thus protecting the pipeline. Metropolitan uses stray current drains extensively on PCCP to prevent corrosion.

Metropolitan's PCCP are highly susceptible to stray current corrosion by virtue of their large diameters and because they are not electrically isolated from the soil. Corrosion is the major cause of prestressing wire breakage and potential failure of PCCP sections. Metropolitan's conveyance and distribution system includes 163 miles of large diameter PCCP. Installation of current drain stations provides a cost-effective means to extend the life of these pipelines, and to alleviate the potential for emergency repairs.

These four projects will install a total of 98 stray current drain stations along 75 miles of PCCP lines. The majority of these sites are located in public rights-of-way and will require permits from over a dozen cities and responsible agencies.

Project No. 1 – Allen-McColloch Pipeline Stray Current Drain Stations – Preliminary Design Phase ($85,000)

The AMP line extends south approximately 23 miles from the Diemer plant in Yorba Linda to the El Toro Reservoir in Mission Viejo. The southernmost portion (nine miles) of the AMP is PCCP which is paralleled by numerous cathodically protected pipelines along its route. Testing performed by Metropolitan staff has identified that stray current conditions are creating corrosion on the AMP.

Staff recommends proceeding with preliminary design of stray current drain stations for the AMP. The project will include installation of current drain stations at 18 locations along a 9-mile stretch of the pipeline, between Station 695+08 and Station 1162+09. Work at each drain station will include the installation of sacrificial anodes, reference electrodes, test station cabinet, and conduits.

This action appropriates $85,000 and authorizes preliminary design phase activities for the AMP stray current drain stations at 18 locations. Planned activities include field measurements and technical analyses, site surveys, preparation of a preliminary design report and environmental documentation, permitting, and development of a construction cost estimate. All preliminary design activities will be performed by Metropolitan staff. Staff will return to the Board at a later date for authorization of final design.

Project No. 2 – Sepulveda Feeder Stray Current Drain Stations – Preliminary Design Phase ($140,000)

The Sepulveda Feeder extends south approximately 42 miles from the Jensen plant in Granada Hills to an interconnection with the Second Lower Feeder in Torrance. The Sepulveda Feeder was installed in the early 1970s. Most of the feeder (approximately 37 miles) is constructed of PCCP and is located in a dense, urban area. It closely parallels numerous cathodically protected pipelines along its route. In 1998, Metropolitan installed stray current drain stations at 24 sites to mitigate interference detected during monitoring. Testing performed by Metropolitan staff has identified that most of these drain stations are no longer able to effectively mitigate stray currents because they have reached the end of their useful life. In addition, staff has identified the need for 12 new drain stations to mitigate newly detected stray current interference.

Staff recommends proceeding with preliminary design to add new current drain stations for the Sepulveda Feeder, and to replace depleted drain stations. The project will include replacement of 24 drain stations and installation of 12 new drain stations along a 42-mile stretch of the pipeline, between Station 60+00 and Station 2273+00. Work will include replacing the 24 existing depleted sacrificial anodes, replacement of deteriorated appurtenant equipment, and installation of new sacrificial anodes, reference electrodes and test cabinet equipment at 12 locations.

This action appropriates $140,000 and authorizes preliminary design phase activities for the Sepulveda Feeder stray current drain stations at 36 locations. Planned activities include field measurements and technical analyses, site surveys, preparation of a preliminary design report and environmental documentation, permitting, and development of a construction cost estimate. All preliminary design activities will be performed by Metropolitan staff. Staff will return to the Board at a later date for authorization of final design.

Project No. 3 – Second Lower Feeder Stray Current Drain Stations – Preliminary Design Phase ($150,000)

The Second Lower Feeder extends west approximately 39 miles from the Diemer plant in Yorba Linda to Palos Verdes Reservoir in Rolling Hills Estates. The pipeline was installed in the early 1970s. Most of the Second Lower Feeder (approximately 30 miles) is constructed of PCCP that is closely paralleled by numerous cathodically protected oil and gas pipelines. In 1998, Metropolitan installed stray current drain stations at 38 sites on the Second Lower Feeder to mitigate interference detected during monitoring. Testing performed by Metropolitan staff has identified that most of these drain stations are no longer able to effectively mitigate stray currents because they have reached the end of their useful life. In addition, staff has identified the need for 10 new drain stations to mitigate newly detected stray current interference.

Staff recommends proceeding with preliminary design to add new current drain stations for the Second Lower Feeder and to replace depleted drain stations. The project will include replacement of 33 drain stations and installation of 10 new drain stations along a 22-mile stretch of the pipeline, between Station 920+00 and Station 2060+00. Work will include replacing the 33 existing depleted sacrificial anodes, replacement of deteriorated appurtenant equipment, and installation of new sacrificial anodes, reference electrodes and test cabinet equipment at 10 locations.

This action appropriates $150,000 and authorizes preliminary design phase activities for the Second Lower Feeder stray current drain stations at 43 locations. Planned activities include field measurements and technical analyses, site surveys, preparation of a preliminary design report and environmental documentation, permitting, and development of a construction cost estimate. All preliminary design activities will be performed by Metropolitan staff. Staff will return to the Board at a later date for authorization of final design.

Project No. 4 – Calabasas Feeder Stray Current Drain Station – Final Design Phase ($45,000)

The Calabasas Feeder delivers treated water from the Jensen plant to Las Virgenes Municipal Water District. The Calabasas Feeder is located in western Los Angeles County and extends south from the West Valley Feeder No. 2. This 54-inch diameter prestressed concrete cylinder pipeline was constructed in 1975 and is 9.3 miles long. Testing performed by Metropolitan staff has identified that cathodic protection systems on adjacent pipelines are creating stray current interference on the Calabasas Feeder.

Staff recommends proceeding with final design of a new stray current drain station for the Calabasas Feeder. The project will include installation of one drain station to protect an approximate 1,000-foot stretch of the pipeline between Station 118+96 and Station 130+00. Work at the drain station includes the installation of sacrificial anodes, reference electrodes, test station cabinet and conduits.

This action appropriates $45,000 in budgeted funds and authorizes final design phase activities for the Calabasas Feeder stray current drain station. Planned activities include engineering design, preparation of drawings and specifications, receipt of competitive bids, development of a construction cost estimate, and all other activities in advance of award of a construction contract. All final design activities will be performed by Metropolitan staff. The requested funds include $14,250 for final design; $13,100 for permitting and project management; $10,900 for Metropolitan force potholing of underground utilities; and $6,750 in remaining budget. The final design cost as a percentage of the estimated construction cost is approximately 14 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 $100,000 to $120,000. Staff will return to the Board at a later date for award of a construction contract.

Summary

This action appropriates $420,000 and authorizes four pipeline protection projects within the distribution system. All work has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2010/11 capital budget. See **Attachment 1** for the Financial Statement, and **Attachment 2** for the Location Map.

These projects are consistent with Metropolitan's goals for sustainability by enhancing reliability of the existing conveyance and distribution system in order to maintain reliable water deliveries in the future.

Project Milestones

September 2010 – Completion of final design of Calabasas Feeder Stray Current Drain Station

December 2010 – Completion of preliminary design of AMP, Sepulveda Feeder and Second Lower Feeder Stray Current Drain Stations

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

Allen-McColloch pipeline, Sepulveda Feeder and Second Lower Feeder Current Drain Stations – Preliminary Design Phase

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action consists 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 as 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).

CEQA determination for Option #2:

None required

Calabasas Feeder Current Drain Station – Final Design Phase

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action involves the funding and minor alterations of existing private or public facilities, along 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 or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under both Class 1 and Class 4 Categorical Exemptions (Sections 15301 and 15304 of the State CEQA Guidelines).

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

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determinations and

a. Appropriate $420,000;
b. Authorize preliminary design of stray current drain stations on the Allen-McColloch pipeline, Sepulveda Feeder, and Second Lower Feeder; and
c. Authorize final design of stray current drain station on the Calabasas Feeder.

Fiscal Impact: $420,000 in budgeted funds under Approp. 15441

Business Analysis: These projects will protect Metropolitan's assets, increase service reliability to member agencies, and reduce the risk of costly emergency repairs.

Option #2

Do not authorize the stray current drain station projects at this time.

Fiscal Impact: Unknown

Business Analysis: This option would forego an opportunity to enhance reliability and extend service life on water delivery to Metropolitan's member agencies, and could lead to higher costs, more extensive repairs, and additional unplanned shutdowns.

Staff Recommendation

Option #1

5/21/2010
Roy L Wolfe *Date*
Manager, Corporate Resources

5/26/2010
Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statement

Attachment 2 – Location Map

Ref# cr12604547

Financial Statement for Conveyance and Distribution System Rehabilitation Program – Phase II

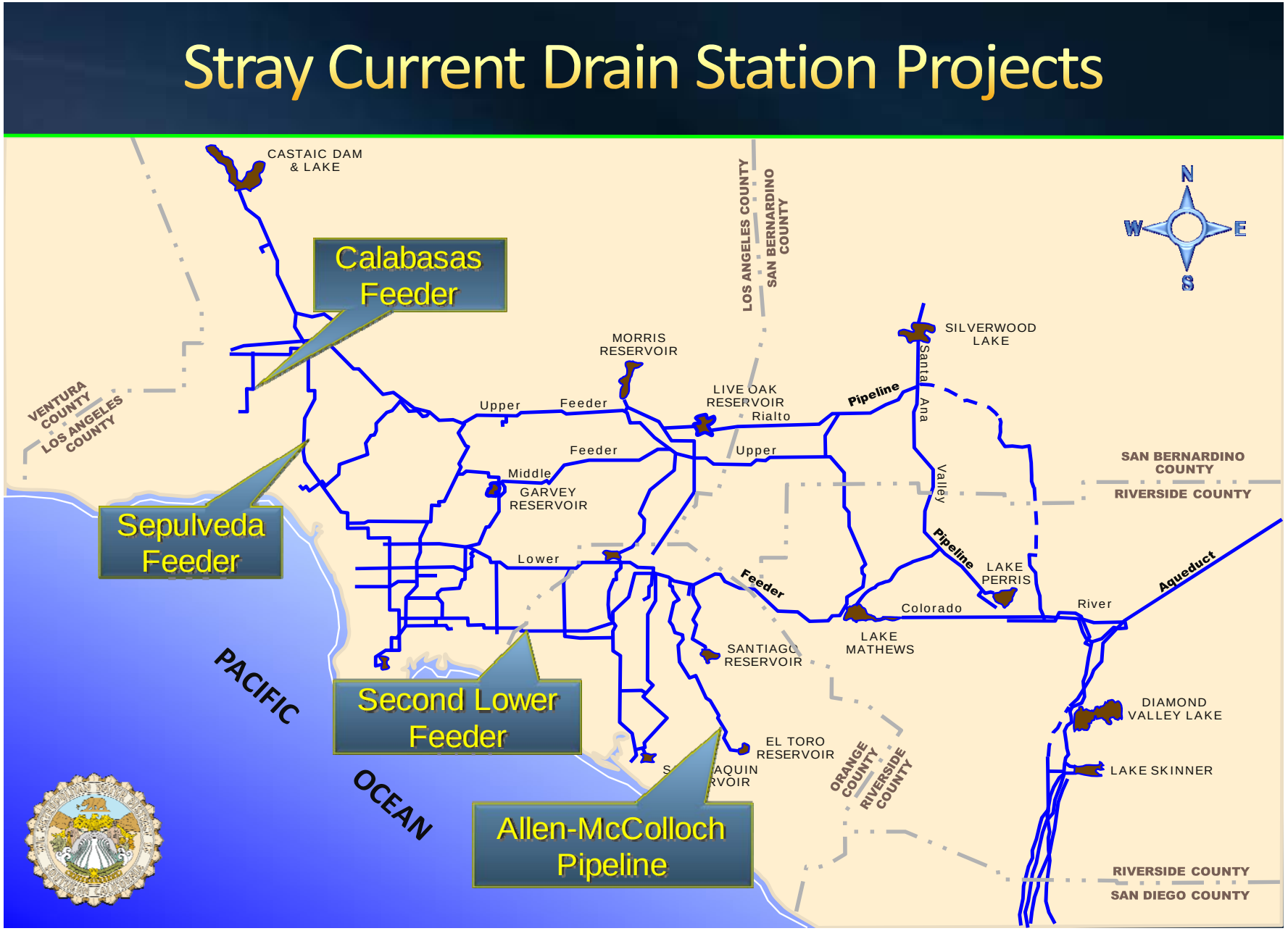
A breakdown of Board Action No. 22 for Appropriation No. 15441 for four stray current drain station projects* for the Allen-McColloch pipeline, Sepulveda Feeder, Second Lower Feeder, and Calabasas Feeder is as follows:

	Previous Total Appropriated Amount (May Exec. Comm. 2010)		Current Board Action No. 22 (June 2010)	New Total Appropriated Amount
Labor				
Studies and Investigations	$ 1,265,600		$ -	$ 1,265,600
Preliminary Design	141,600	**	227,000	368,600
Final Design	2,036,150		14,250	2,050,400
Owner Costs (Program mgmt., permitting envir. doc.)	2,789,650		120,500	2,910,150
Construction Inspection and Support	858,100		-	858,100
Metropolitan Force Construction	5,079,200		5,900	5,085,100
Materials and Supplies	1,077,600		2,500	1,080,100
Incidental Expenses	616,900		7,500	624,400
Professional/Technical Services	867,500		-	867,500
Equipment Use	181,200		-	181,200
Contracts	5,522,647		-	5,522,647
Remaining Budget	2,335,853	**	42,350	2,378,203
Total	**$ 22,772,000**		**$ 420,000**	**$ 23,192,000**

Funding Request

Program Name:	Conveyance and Distribution System Rehabilitation Program – Phase II		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15441	**Board Action No.:**	22
Requested Amount:	**$** 420,000	**Capital Program No.:**	15441-I
Total Appropriated Amount:	**$** 23,192,000	**Capital Program Page No.:**	277
Total Program Estimate:	**$** 53,850,000	**Program Goal:**	I-Infrastructure Reliability

* This action is the initial appropriation for all four stray current drain station projects.
** Reflects reallocation of $10,000 from Remaining Budget to Preliminary Design for Calabasas Feeder Stray Current Drain project.


Stray Current Drain Station Projects
CASTAIC DAM & LAKE
Calabasas Feeder
Sepulveda Feeder
Second Lower Feeder
Allen-McColloch Pipeline
PACIFIC OCEAN
VENTURA COUNTY
LOS ANGELES COUNTY
LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
MORRIS RESERVOIR
Upper Feeder
Feeder
Middle
GARVEY RESERVOIR
Lower
Feeder
LIVE OAK RESERVOIR
Rialto
Upper
Pipeline
SILVERWOOD LAKE
Santa Ana
Valley
Pipeline
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
LAKE PERRIS
Aqueduct
River
Colorado
LAKE MATHEWS
SANTIAGO RESERVOIR
EL TORO RESERVOIR
ORANGE COUNTY
RIVERSIDE COUNTY
DIAMOND VALLEY LAKE
LAKE SKINNER
RIVERSIDE COUNTY
SAN DIEGO COUNTY
N
W
E
S