THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- Board of Directors
  Engineering and Operations Committee

1/8/2013 Board Meeting

7-4

Subject

Appropriate $160,000; and authorize final design of a cathodic protection system for the Sepulveda Feeder (Approp. 15441)

Executive Summary

This action authorizes final design of a cathodic protection system on the southern reach of the Sepulveda Feeder. Twenty-two stray current drain stations are planned to be installed to protect five miles of the feeder from corrosion due to stray currents.

Timing and Urgency

A recent corrosion survey of the Sepulveda Feeder identified that this prestressed concrete cylinder pipe (PCCP) line is experiencing induced stray current corrosion damage. While the corrosion damage is not yet extensive, continued deterioration of the pipeline could lead to eventual leakage and possible rupture. The planned cathodic protection system is a proactive and cost-effective measure to mitigate against stray current interference, and will reduce the risk of costly emergency repairs. Given the importance of this pipeline in delivering treated water to Metropolitan's member agencies, staff recommends moving forward with the project at this time.

This project has been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria, and is categorized as an Infrastructure Rehabilitation and Replacement project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2012/13.

Details

Background

Buried metallic pipelines are often protected from corrosive soils by the installation of cathodic protection systems. Use of these systems is required by state regulation on pipelines that transport hazardous materials such as oil or gas. The installation of these systems may, however, induce corrosion in other 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 on metallic pipes and may cause significant loss of metal. PCCP segments are fabricated with tightly wound steel reinforcing wire which is covered with cement mortar. Corrosion is the major cause of prestressing wire breakage and potential failure of PCCP segments.

Metropolitan's distribution system contains 163 miles of PCCP lines, which are tested for stray currents every one to two years. When stray currents are detected, staff recommends the installation of cathodic protection systems to extend the life of the pipelines and reduce the potential for emergency repairs. Two types of cathodic protection systems are used: galvanic cathodic protection and impressed current cathodic protection. The type of system to be installed is determined based on the level of stray current interference, soil conditions, installation and maintenance costs, and availability of a power source. Under galvanic systems, which are also referred to as current drain stations, anodes are electrically connected to the pipeline metal without using a power source. Because the anodes are composed of metals that are more easily oxidized than the materials in welded steel and

PCCP lines, the anodes corrode first and continue to corrode until they need to be replaced. Impressed current systems use an external power source to apply a protective current to the pipeline. This protective current is then discharged through anodes as in the current drain system. Replacement intervals for the anodes typically range from 10 to 20 years.

The Sepulveda Feeder delivers treated water from the Joseph Jensen Water Treatment Plant to an interconnection with the Second Lower Feeder in Torrance. This feeder is approximately 42 miles long and was installed in the early 1970s. Most of the Sepulveda Feeder (approximately 37 miles) is constructed of PCCP, while the remainder is constructed of welded steel pipe. The line has a relatively high operating pressure of 280 psi.

A section of the southern portion of the Sepulveda Feeder, which extends between interconnections with the West Basin Feeder and the Second Lower Feeder, crosses several cathodically protected oil and gas pipelines. These pipelines originate from refineries and oil handling facilities located in Torrance and San Pedro. The close proximity of the Sepulveda Feeder to these cathodically protected lines subjects the Sepulveda Feeder to increased levels of stray currents, resulting in accelerated corrosion.

In 1998, Metropolitan installed three stray current drain stations on this reach of the Sepulveda Feeder to mitigate stray current interference detected during routine monitoring. Recent testing by Metropolitan staff has identified that these three drain stations are no longer effective in mitigating stray currents. In June 2011, Metropolitan's Board authorized preliminary design to replace the existing stray current drain stations and add additional stations along the Sepulveda Feeder to protect the feeder between the West Basin Feeder and the Second Lower Feeder. During preliminary design, staff concluded that a total of 22 stations are required to adequately protect the pipeline in this reach. Preliminary design is now complete, and staff recommends proceeding with final design.

Sepulveda Feeder South Cathodic Protection – Final Design Phase ($160,000)

Planned final design phase activities include identification of utilities, preparation of drawings and specifications, development of a construction cost estimate, local agency permitting, receipt of competitive bids, and all other activities in advance of award of a construction contract. The work will be performed primarily by Metropolitan staff, with support for utility identification by a consultant.

This action appropriates $160,000 and authorizes final design of 22 stray current drain stations on the southern reach of the Sepulveda Feeder. The requested funds include $79,000 for final design; $16,000 for identification of utilities by a consultant, FJS Cable Engineering; $48,000 for permitting, bidding, and project management; and $17,000 in remaining budget. The final design cost as a percentage of the estimated construction cost is approximately 8.8 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 $900,000 to $1.1 million. Staff will return to the Board at a later date for award of the construction contract.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2012/13 capital expenditure plan. This work is included within capital Appropriation No. 15441, the Conveyance and Distribution System Rehabilitation Program – FY 2006/07 Through 2011/12, which was initiated in fiscal year 2006/07. Other projects authorized under Appropriation No. 15441 include the Santa Ana River Bridge Seismic Retrofit, Eagle Rock and Puddingstone Spillway Gates Rehabilitation, and the Sepulveda Feeder Repairs. With the present action, the total funding for Appropriation No. 15441 will increase from $43,499,002 to $43,659,002. See **Attachment 1** for the Financial Statement, and **Attachment 2** for the Location Map.

Project Milestone

September 2013 – Completion of final design of cathodic protection system on the southern reach of the Sepulveda Feeder

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed project was previously determined to be categorically exempt under the provisions of CEQA and State CEQA Guidelines. The activities associated with this project were found by the Board to be exempt under Classes 1, 2 and 6, Sections 15301, 15302, and 15306 of the State CEQA Guidelines on June 14, 2011. A Notice of Exemption (NOE) was filed on the project at that time and the statute of limitations has ended. With the current board action, there is no substantial change proposed to the project since the original NOE was filed. Hence, the previous environmental documentation in conjunction with the project fully complies with CEQA and the State CEQA Guidelines. Accordingly, no further CEQA documentation is necessary for the Board to act with regards to the proposed action.

The CEQA determination is: Determine that the proposed action has been previously addressed in the 2011 NOE (Classes 1, 2, and 6, Sections 15301, 15302, and 15306 of the State CEQA Guidelines) and that no further environmental analysis or documentation is required.

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination and

a. Appropriate $160,000; and
b. Authorize final design of current drain stations on the Sepulveda Feeder.

Fiscal Impact: $160,000 of capital funds under Approp. 15441

Business Analysis: This project 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 cathodic protection system at this time.

Fiscal Impact: None

Business Analysis: Under this option, staff will continue to monitor levels of stray current and corrosion. This option would forgo an opportunity to enhance reliability and extend the operating life of the Sepulveda Feeder, and could lead to higher repair costs and unplanned shutdowns.

Staff Recommendation

Option #1

12/19/2012

Gordon Johnson *Date*
Manager/Chief Engineer,
Engineering Services

12/20/2012

Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statement
Attachment 2 – Location Map

Financial Statement for Conveyance and Distribution System Rehabilitation Program – FY 2006/07 Through FY 2011/12

A breakdown of Board Action No. 50 for Appropriation No. 15441 for the Sepulveda Feeder South Cathodic Protection[1] project is as follows:

	Previous Total Appropriated Amount (Dec. 2012)	Current Board Action No. 50 (Jan. 2013)	New Total Appropriated Amount
Labor			
Studies & Investigations	$ 2,716,000	$ -	$ 2,716,000
Final Design	3,722,293	78,000	3,800,293
Owner Costs (Bidding, permitting & program mgmt.)	5,165,400	48,000	5,213,400
Submittals Review & Record Drwgs	296,670	-	296,670
Construction Inspection & Support	2,012,550	-	2,012,550
Metropolitan Force Construction	8,906,710	-	8,906,710
Materials & Supplies	2,299,400	-	2,299,400
Incidental Expenses	883,900	1,000	884,900
Professional/Technical Services	2,535,000	-	2,535,000
FJS Cable Engineering	-	16,000	16,000
Right-of-Way	550,000	-	550,000
Equipment Use	325,200	-	325,200
Contracts	11,981,524	-	11,981,524
Remaining Budget	2,104,355	17,000	2,121,355
Total	**$ 43,499,002**	**$ 160,000**	**$ 43,659,002**

Funding Request

Program Name:	Conveyance and Distribution System Rehabilitation Program – FY 2006/07 Through FY 2011/12		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15441	**Board Action No.:**	50
Requested Amount:	**$** 160,000	**Capital Program No.:**	15441-I
Total Appropriated Amount:	**$** 43,659,002	**Capital Program Page No.:**	284
Total Program Estimate:	**$** 114,849,000	**Program Goal:**	I-Infrastructure Reliability

[1] The total amount expended to date on the Sepulveda Feeder South Cathodic Protection project is approximately $124,500.

Distribution System