



## ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7

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**ORIGINATING SECTION:** Facilities Engineering

**CONTACT:** Steven Ellis/Rhett Alzona

**AGENDA DATE:** March 20, 2019

**ITEM NO.** 9d

**SUBJECT:** Engineering Services Contract with Carollo Engineers for the MGDG Concentrate Pipeline Batch Cleaning Project

### **SUMMARY:**

- The Mocho Groundwater Demineralization Plant (MGDP) has been operational since 2009.
- Over the years, scaling/material has been building up on the interior of the pipeline used to convey concentrate solution from the MGDG process to Dublin San Ramon Services District's waste water plant effluent pipeline for discharge into the San Francisco Bay via Livermore-Amador Valley Water Management Agency (LAVWMA) Pipeline.
- The material build-up inside the concentrate pipeline is reducing the MGDG production capacity by limiting the ability to discharge the concentrate at the proper flow rate.
- In order to remove the existing material build-up, the recommendation is to perform an acid-based batch cleaning in FY 19/20 as the Phase 1 project.
- To manage future material build-up, the recommendation is to install a permanent acid injection system for continuous acid feed to the concentrate pipeline for pH adjustment to minimize scaling as the Phase 2 project.
- With their familiarity and experience, Carollo Engineers is best suited to perform the design and construction support services for the batch cleaning operation.
- Staff recommends entering into a contract with Carollo Engineers for design and construction support services for the Phase 1 batch cleaning project in an amount not-to-exceed \$178,000, which includes a 10% contingency.

### **FUNDING:**

Funding for the project is available from Fund 120 – Renewal/Replacement and System Wide Improvements.

### **RECOMMENDED ACTION:**

Adopt the attached resolution.

## **BACKGROUND:**

The Mocho Groundwater Demineralization Plant (MGDP) has been operational since 2009. The minerals removed from the plant by the reverse osmosis (RO) membrane system form a concentrated solution that is discharged through a dedicated concentrate pipeline to Dublin San Ramon Services District's (DSRSD) waste water plant effluent pipeline for discharge to the San Francisco Bay via Livermore-Amador Valley Water Management Agency (LAVWMA) Pipeline.

Over the years, the concentrate has been precipitating out of solution and has caused a scaling build-up (primarily calcium carbonate) along the inside of the concentrate pipeline. The scaling build-up accelerated during the drought due to the intermittent operation of the MGDP plant. The scaling build-up thereby reduces the concentrate pipeline's ability to handle the maximum flow capacity from the RO membrane system.

In November 2016, Carollo Engineers, Inc. evaluated the material build-up and in their report, they recommended a chemical batch cleaning process to reduce the build-up and/or an acid injection facility to manage the material build-up. Funding in the amount of \$1,210,000 to undertake a batch cleaning operation was included in the Capital Improvement Program (CIP) and budget for Fiscal Year 19/20. During the interim period, Zone 7 installed a system to flush the concentrate pipeline after plant shutdowns. This system flushes and fills the concentrate pipeline with potable water instead of concentrate solution during periods of inactivity. Additionally, staff coordinated with various scale inhibitor manufacturers to test better scale inhibitors to keep the concentrate material in solution longer. Despite these efforts, the material build-up continues, although at a slower rate.

## **DISCUSSION:**

Currently, the MGDP cannot be operated at full membrane capacity due to the reduced capacity of the concentrate pipeline from the material build-up. As build-up continues, the situation is getting worse. In order to best manage the build-up in the concentrate pipeline in the near-term, the Phase 1 chemical batch cleaning process would be used to reduce the current build-up with work performed before the end of the calendar year. The batch cleaning process will use an acid to help dissolve the scaling/material build-up. It is anticipated that the basic set up will be large containment tanks (e.g. Baker tanks) with piping and pumps on each end of the concentrate pipeline to be cleaned. Isolation valves, drainage ports, and tees would need to be installed for isolation and to flush the acid solution from one end to the other. The isolation valves, drainage ports, and tees installed in the concentrate pipeline would provide for easier batch cleaning, if needed, in the future. Total cost for the batch cleaning project is estimated to be \$1.2 million.

As the original designers of MGDP, being familiar with the issues and their experience with concentrate pipeline batch cleaning operations at other similar plants, Carollo Engineers, Inc. is best suited to perform the engineering services for the project. The current budget for the batch cleaning project is \$1,210,000. Carollo's design and construction support services for the batch cleaning project is estimated to be \$178,000 which includes a 10% contingency, contractor cost for the implementation of the batch cleaning process is estimated to be \$880,000 and the remainder being staff and other miscellaneous costs.

Over the long-term, installation of a permanent acid injection facility as a Phase 2 project is needed. Continuous acid injection feed would lower pH and better manage material build-up in

the concentrate pipeline. The anticipated project cost for the acid injection facility is \$2.2 million. In addition to more detailed planning and design, outside agency reviews for the introduction of a new chemical to the MGD site and the environmental review process for a new permanent facility is expected to take a couple of years. Given the need, cost and schedule for implementation, the acid injection facility will be included as a project in the Capital Improvement Program and in the upcoming budget. Staff anticipates coming back to the Board to consider approving engineering services contract for the permanent acid injection facility (Phase 2 project) in summer of 2019 to start design, environmental and permitting.

**SCHEDULE:**

Complete design and advertise for bids at the end of the summer 2019 and complete batch cleaning process by the end of the calendar year 2019.

**ATTACHMENTS:**

Zone 7 Board Resolution

ZONE 7  
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO.

INTRODUCED BY  
SECONDED BY

BE IT RESOLVED that the Board of Director of Zone 7 of the Alameda County Flood Control and Water Conservation District does hereby authorize the General Manager to negotiate, execute and amend as needed, a contract with Carollo Engineers, Inc. for design and construction support services for batch cleaning of the concentrate disposal pipeline project for the Mocho Groundwater Demineralization Plant in an amount not to exceed \$178,000, which includes 10% contingency.

ADOPTED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT:

ABSTAIN:

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on March 20, 2019.

By: \_\_\_\_\_  
President, Board of Directors