



# Memorandum

**TO:** HONORABLE MAYOR AND  
CITY COUNCIL

**FROM:** John Stufflebean  
Jennifer A. Maguire  
Joseph Horwedel

**SUBJECT:** ESD TREATMENT PLANT -  
CAPITAL LIMIT DATED  
POSITIONS

**DATE:** May 20, 2011

Approved

Date

5-27-11

## RECOMMENDATION

It is recommended that the City Council:

1. Amend the 2011-2012 Proposed Operating Budget to establish the following limit dated positions in the Environmental Services Department from July 1, 2011 through June 30, 2016:
  - a. 1.0 Process and Systems Specialist II;
  - b. 2.0 Plant Operator;
  - c. 2.0 Plant Mechanic;
  - d. 1.0 Chemist; and
  - e. 1.0 Laboratory Technician I.
2. Amend the 2011-2012 Proposed Operating Budget to establish 1.0 Planner II position in the Planning, Building, and Code Enforcement Department, limit dated from July 1, 2011 through June 30, 2013.

## BACKGROUND

The San José/Santa Clara Water Pollution Control Plant (Plant), originally constructed in 1956 and expanded in the 1960s and 1970s, is embarking on a major program of rehabilitation and facility replacement. This program will be guided by the recently completed Plant Master Plan, of which the preferred alternative was approved by the City Council on April 19, 2011. The Plant Master Plan sets the direction for the Water Pollution Control Plant Capital Improvement Program (CIP) for the next thirty years, with approximately \$2.2 million in projects that will address aging infrastructure, new regulations, and community growth.

May 20, 2011

**Subject: ESD Treatment Plant – CIP Limited Dated Positions**

Page 2

In the early years of this capital program ramp up, a number of new technologies and treatment options will need to be piloted and tested. This testing phase is expected to take approximately five years, and creates a need for temporary staffing as described below.

## **ANALYSIS**

The recommended positions are required to support the initial ramp up of the Water Pollution Control Plant CIP, and particularly the piloting of new technologies that will take place over the next five years. Funding for these positions has been assumed in the 2012-2016 Proposed CIP, however, the analysis of the exact position requirements had not yet been completed by the publication of the 2011-2012 Proposed Operating Budget.

Several large projects included in the Water Pollution Control Plant 2012-2016 Proposed CIP are complex rehabilitation projects that involve changing technology or optimizing the existing technology. These projects require significant piloting and data collection efforts to confirm the design parameters and ensure successful designs. Training protocols and operational procedures for the new technology and processes must also be developed. This design, piloting, and optimization phase is expected to take approximately five years, during which additional staff will be needed to support piloting, evaluation, and design efforts. Some of this additional staff will also support coordination between design teams and existing operations and maintenance staff, to ensure the new construction does not interrupt the treatment of wastewater, and that new technology functions seamlessly with existing Plant infrastructure. Major projects requiring piloting and alternative technology evaluation include:

### **Digester Rehabilitation**

The Digester Rehabilitation project which includes structural rehabilitation of the aging digester tanks, and mechanical and process upgrades to improve performance. As these upgrades are designed, significant oversight and coordination between design teams and the operations and maintenance staff responsible for the existing digesters will be required. Additionally, part of the Digester Rehabilitation project upgrades to the thickening process just upstream of the digesters to reduce the number of digesters the Plant must have and enhance their performance. The upgrade of this thickening process will require dedicated operations staff to collect data, review the performance of the piloted upgrades, and coordinate with existing operations to ensure successful implementation. This program also includes the integration of a Fats, Oils and Grease (FOG) pilot receiving station into the digestion program.

The additional staffing needed for this project for the next five years includes 1.0 Plant Operator, 0.5 Lab Technician, and 0.5 Chemist. The Plant Operator will help run pilots, collect data required for the testing of the thickening process and be responsible for the everyday oversight of the FOG station. The Lab Technician and Chemist will be part of the laboratory team to handle the additional sampling and analysis needs generated from this optimization and piloting effort, including the FOG pilot. In addition to these positions, it is anticipated that the creation of a Principal Sanitary Engineer classification, and the possible addition of a Principal Sanitary Engineer position will be brought forward for Council consideration at a later date. This position

would be the lead and technical director for this estimated \$60M project, providing the overall strategy, QA/QC of consultant work, directing the piloting efforts and managing the program.

#### *Fine Bubble Membrane Diffuser Conversion*

The aeration process at the Plant accounts for 50% of its energy usage. The Fine Bubble Membrane Conversion project, which aims to reduce that energy usage by at least 50 percent, will require piloting to select the most appropriate fine bubble diffusers for the Plant, determine the expected life of the diffusers and the aeration air controls they require, and to evaluate what maintenance and operational issues may arise from different types of technology. This piloting will involve long term side by side testing of different types of fine bubble diffuser systems including controls, flow meters and dissolved oxygen meters. This process is estimated to take five years.

The additional staffing needed for this project for the next five years includes 1.0 Plant Operator, 1.0 Plant Mechanic, 0.5 Lab Technician, and 0.5 Chemist. The Plant Operator will be responsible for operation of the parallel trains of fine bubble diffusers. The Plant Mechanic will assist the engineering staff and operators as they modify the air controls including valving and metering. The Lab Technician will perform additional testing required to calibrate new meters and verify diffuser performance. The Chemist will analyze the laboratory data and performance of the diffusers and related instrumentation to determine performance, initially and over time.

#### *Advanced Process Control and Automation*

The Process Control and Automation project, which is a long term effort to optimize the operations of the plant, will require additional testing and piloting to select the best strategies for process automation in each of the major process areas. The first step in the automation project is accurate measurement of air, liquid and solids flows. Initial work by consultants has concluded that 70 percent of the meters tested are either past their intended service life, inappropriate for the given use, not installed in an appropriate way, or have poor maintenance records. Automation requires accurate metering so testing and replacing meters is a key element of the project. This process is estimated to take 5 years.

A Process and Systems Specialist, who will be responsible for working with the consultant to establish new computer interface and programming strategies is needed to staff this project for the next five years.

#### *Secondary and Nitrification Clarifier Rehabilitation*

The Secondary and Nitrification Clarifier Rehabilitation projects, which assure the structural integrity and reliability of the aging clarifier tanks, will require piloting to determine the most efficient modifications to the clarifier mechanisms, inlet and outlet channels and piping.

Currently consultants are using computational fluid dynamic models to recommend the probable best design for modifications by full scale piloting. This piloting will involve installation of new equipment, channels and piping in several clarifiers, followed by monitoring of the modified and

May 20, 2011

**Subject: ESD Treatment Plant – CIP Limited Dated Positions**

Page 4

control clarifier performance with additional testing and instrumentation. This process, design and implementation is estimated to take 5 years.

The Plant has two parallel Secondary Treatment (Biological Nutrient Removal) process streams with a total of 42 Secondary Clarifiers. These clarifiers were constructed at various times and have different structural design and layout as well as different sludge and scum collection equipment and influent and effluent launders. To effectively pilot new geometry for flows into and out of the clarifiers we plan to pilot a minimum of two and as many as 5 clarifiers.


The additional staffing needed for this project will develop, schedule, and supervise the pilot, collect samples, perform measurements, analyze results, evaluate efficiency and provide recommendations for the rest of the plant's secondary clarifiers. A Plant Mechanic who will assist in the development of the bid package(s) including detailed equipment evaluations; work with operations to develop phasing and construction shut down schedules; review construction packages; and assist with pilot construction and operations is required to staff this project for five years.

*Plant Master Plan EIR/CIP CEQA Support*

In addition to the piloting and design efforts described above, the implementation of the Plant Master Plan recommendations requires environmental review of the proposed alternatives for the California Environmental Quality Act/National Environmental Protection Agency (CEQA/NEPA) process, and development of the Environmental Impact Report/Environmental Impact Statement (EIR/EIS). A dedicated Planner II is needed for two years to guide this process. This position will work with consultants to ensure the EIR meets legal standards, provide direction on City Policy throughout the process and coordinate with regulatory agencies. The Planner may also support other CEQA efforts for the Plant, including the environmental clearance needed to proceed with waste to energy conversion projects. This position is recommended to be added to the Planning, Building and Code Enforcement Department.

The attached chart summarizes the CIP projects that require significant piloting, evaluation of alternative technologies, and design support over the next five years, and indicates the limited staffing component required to support each.

  
JOHN STUFFLEBEAN  
Director of Environmental Services

  
JENNIFER A. MAGUIRE  
Budget Director

/s/  
JOSEPH HORWEDEL  
Director of Planning, Building, and Code Enforcement

Attachment

For questions or more information, please contact Linda Charfauros at 408 535-8553 or Bhavani Yerrapotu at (408) 945-5320.

## Limit Dated Positions Required for Treatment Plant Capital Program through 2016

The chart below summarizes the CIP projects that rely on the proposed limit-dated staffing.

<b>Project Title</b>	<b>Positions Required</b>	<b>Duration</b>
<b>Digester Rehabilitation</b>	1.0 Plant Operator 0.5 Lab Technician I 0.5 Chemist	5-year 5-year 5-year
<b>Fine Bubble Membrane Diffuser Conversion</b>	1.0 Plant Operator 1.0 Plant Mechanic 0.5 Lab Technician I 0.5 Chemist	5-year 5-year 5-year 5-year
<b>Advanced Process Control and Automation</b>	1.0 Process & System Spec II	5-year
<b>Secondary and Nitrification Clarifier Rehabilitation</b>	1.0 Plant Mechanic	5-year
<b>Plant Master Plan EIR / CIP CEQA Support</b>	1.0 Planner II	2-year