

PROJECT DESCRIPTION

INTRODUCTION

Project Overview

The City of Grass Valley (City) Public Works Department operates a wastewater treatment plant (WWTP) that provides sewer service to 12,100 residents and 1,700 businesses (including industries). The Grass Valley WWTP is classified as a tertiary wastewater treatment plant that uses a nitrifying/denitrifying activated sludge process followed by filtration and disinfection to process wastewater. The WWTP consists of bar screening; primary sedimentation; aeration basins (with anoxic compartments); secondary sedimentation; return sludge pumping facilities and biological treatment by activated sludge; mono-media filtration; disinfection; and dechlorination. A description of how the wastewater treatment plant works and a flow diagram for the liquid stream wastewater treatment facilities is provided in Appendix A to this Initial Study. The City currently uses gaseous chlorine for disinfection of the effluent before discharging to Wolf Creek. The WWTP is permitted to discharge to Wolf Creek an average dry weather flow of not to exceed 2.78 million gallons per day.

The City's WWTP was originally constructed in 1950, with additional modifications and improvements made in the late 1970's, early 1980's, and 1990's. A new National Pollutant Discharge Elimination System (NPDES) permit was issued for the wastewater treatment plant by the Central Valley Regional Water Quality Control Board (RWQCB); the permit was effective on August 1, 2003. The permit included final limits for ammonia, nitrite, nitrite plus nitrate, and coliform for discharges from the wastewater treatment plant. It also includes the limits for several metals, cyanide, and trihalomethanes (THMs), these limits become effective on March 1, 2008.

The City is currently able to meet nitrogen limits with existing systems, although there are some fluctuations in the effluent concentrations of these constituents. Cyanide and THMs are byproducts of chlorine disinfection. Limits on these constituents will become more restrictive in 2008. The City will not be able to meet the future limits for these constituents with their existing disinfection facilities.

The proposed project consists of the construction of improvements to the biological nitrogen removal process to meet nitrogen discharge limits and the addition of ultraviolet (UV) disinfection facilities for removal of fecal coliform to meet new discharge requirements for cyanide and THMs. The project will be constructed within the boundaries of the City's WWTP. The proposed project consists of:

- Removal/decommissioning/removal of existing chlorine gas disinfection equipment;
- Installation of UV disinfection facility in an existing chlorine contact basin;
- Addition of a sodium hypochlorite feed system for the non-potable water system;
- Installation of launder covers on one of the secondary clarifiers;
- Installation of covers on the tertiary filters and other yard structures; and
- Installation of air piping to improve denitrification facilities.

The air piping modifications will provide greater process control during periods of low influent flow to the WWTP to improve the ability to meet existing nitrogen limits. With the removal of the chlorine disinfection

facilities and the addition of the UV disinfection, the THM and cyanide limits will be met.

PROJECT LOCATION

The City of Grass Valley is located about 50 miles northeast of Sacramento, and lies within the County of Nevada. The WWTP is located on a 29-acre site adjacent to Wolf Creek and Highway 49 at 556 Freeman Lane. The project location is shown in Attachment 1: Figure 1.

PROJECT PURPOSE

The purpose of the project is to upgrade the existing facilities at the City of Grass Valley's WWTP to improve discharge water quality, and to meet the requirements of the new NPDES permit.

SRF FUNDING

This project is funded by a State Revolving Fund (SRF) Loan Program, administered by the State Water Resources Control Board (SWRCB), Division of Financial Assistance (Division).

The Federal Water Pollution Control Act (Clean Water Act or CWA), as amended in 1987, provides for establishment of a State Revolving Fund (SRF) loan program. The program is funded by federal grants, state funds, and revenue bonds. The purpose of the SRF loan program is to implement the CWA and various State laws by providing financial assistance for the construction of facilities or implementation of measures necessary to address water quality problems and to prevent pollution of the waters of the State.

The SRF Loan Program provides low-interest loan funding for construction of publicly-owned wastewater treatment facilities, local sewers, sewer interceptors, water reclamation facilities, as well as, expanded use projects such as implementation of non-point source (NPS) projects or programs, development and implementation of estuary Comprehensive Conservation and Management Plans, and storm water treatment.

The current project qualifies for the SRF loan program because it will improve and better protect public health and will meet the requirements of the waste discharge permit issued by the Central Valley RWQCB.

PROJECT DESCRIPTION

Overview

Project improvements are described here in detail. The project will include the following activities:

- Removal of Old Systems
 - Modification of the chlorine building
 - Modification of the chemical building
 - Chlorine gas (Cl₂) injector removal
 - Sulfur dioxide (SO₂) gas facility removal

- UV System Installation
 - Chlorine contact basin modification
 - UV system installation
- Biological Treatment Process
 - Install impure water sodium hypochlorite system
 - Modify secondary clarifier (No. 1)
 - Modify effluent filters
- Other minor modifications

The site layout showing existing and proposed modifications is included in Attachment 1: Figure 2. Site plans including decommissioning/removal and modification plans are available at the City.

REMOVAL OF OLD SYSTEMS

Chlorine Building Modification

The chlorine building currently has capacity to store six chlorine gas (Cl₂) one-ton cylinders, six sulfur dioxide (SO₂) one-ton cylinders and associated equipment, including a sulfonator, chlorinator, chlorine evaporators, and electrical systems and piping. A chlorine gas/sulfur dioxide (SO₂) scrubber is located immediately adjacent to the building. All of the equipment, including the scrubber, will be removed and the electrical systems and piping removed and/or capped.

The City will use all of the gas in the one-ton cylinders before decommissioning. Even if the gas is not completely used, the one-ton cylinders containing the gas will be removed by the gas supplier. Chlorine gas is supplied in one-ton reusable metal cylinders (designed per existing vessel codes). The cylinders are delivered by a licensed hauler, stored on site during use, and then picked up for reuse by the hauler when the cylinders are empty. The cylinders will not need to be cleaned. Other equipment, such as the piping and electrical systems will be disposed of by the contractor.

After equipment removal the building is anticipated to be used for storage of spare parts such as pumps, pump impellers, motors, handrail, grating, etc.

Chemical Building Modification

The current chemical building (as shown in Attachment 2) will be modified. This building includes a hydropneumatic tank, which is used to maintain water pressure in the water distribution system, and an SO₂ injector, which is one component of the sulfonator. The hydropneumatic tank and the SO₂ injector will be removed using conventional decommissioning techniques. There are no plans to install other equipment within this building at this time. The tanks will be properly disposed of by the contractor.

Cl₂ Injector Removal

The existing Cl₂ injectors, associated electrical systems, and piping situated northeast of the effluent filter tank system (Cl₂ Injector No. 1) and at the southerly end of the chlorine contact basins (Cl₂ Injector No. 2) will be removed (injectors and electrical systems) and/or capped (electrical systems and piping). The concrete pads beneath the injectors will be removed and the areas repaved to match the adjacent asphaltic

concrete paving. Injectors will be removed using standard decommissioning techniques and the contractors will be responsible for disposal of all removed parts.

UV SYSTEM INSTALLATION

Chlorine Contact Basin Modification/UV System Installation

Two (2) of the four (4) existing chlorine contact basins will be modified to receive installation of the UV disinfection system. The UV disinfection system includes lamps, ballasts, and a power supply. The light manufacturer has not yet been determined. The number of lamps and the size of the lamps depend on the manufacturer selected. The Trojan system requires 336 lamps, while the Wedeco system requires 432 lamps.

Modifications to the contact basin include addition of concrete to promote flow. The lamps and ballasts will also be added within the concrete basin.

Decommissioning/dismantling of the existing chlorine contact basin includes removal of a series of walkways/catwalks that perpendicularly cross the contact basins, modifications within two of the existing basins to receive the UV disinfection system, and installation of a metal roof above the facility. There will also be associated electrical systems installed. The roof will be approximately 15.8 feet from the bottom of the steel roof to the bottom of the drainage gutter, and 13.3 feet from the bottom of the steel roof to the top of the contact basin.

BIOLOGICAL REMOVAL PROCESS

Secondary Clarifier (No. 1) Modifications

The secondary clarifiers are used to clarify secondary effluent coming from the primary clarifiers. Minor modifications will include installation of fiberglass launder covers over the existing effluent box within the No. 1 secondary clarifier. The covers will be added to prevent algal growth and will be installed using both a crane and manual labor.

OTHER MODIFICATIONS

Install Impure Water Sodium Hypochlorite System

An impure water sodium hypochlorite (NaClO) system (tank and associated electrical systems and piping) will be installed on a new concrete pad immediately north of the existing chlorine contact basins. Sodium hypochlorite is used to disinfect the onsite water supply used only for maintenance and wash down.

The size of the tank will depend on the contractor manufacturer; however, the minimum volume will be 550 gallons, with emergency containment of 115 percent of the total volume. The size of the tank will need a maximum diameter of 6.4 and a maximum height of 5.5 feet. The pipes that will be installed range in sizes but all pipes will be PVC with no lining but a coating.

Effluent Filter Modifications

The effluent filters are part of the tertiary treatment process. The ten existing effluent filter tanks will be

modified by the installation of covers/lids on top of each tank (installed to prevent algal growth). Fiberglass reinforced plastic covers will be installed by replacing the existing 2-inch grating with the fiberglass tread plate. The plate will then be fastened with bolts. This work will be performed by hand with manual labor.

Other Minor Modifications

Other modifications to the existing facility will include modifications to the blower building to install additional blow off piping and valves.

CONSTRUCTION SCHEDULE AND EQUIPMENT

Schedule

The project will begin in the spring of 2008 and will last approximately 1 year. All of the work will be completed in one construction phase, although different types of activities (i.e., excavation, concrete, etc.) may be completed at different times. The general sequence of work will include excavation and buried utility work, demolition, concrete work and backfill, above-grade mechanical and electrical and I&C, paving and site work, and finally startup.

Work will occur approximately 8 hours per day.

Equipment

The type of equipment used for this project will depend on the contractor's approach to the work, and whether or not equipment is owned or rented. The majority of construction equipment that will be used on the site will be used for product delivery (concrete, UV equipment) and the removal of demolished items. Excavation will include trenching for electrical conduit and small concrete slabs on grade with smaller equipment. The following construction equipment is intermittently expected:

- First month
 - No equipment
- Next 3 months
 - One 6 CY dump truck (four weeks of total use)
 - One 2 CY backhoe (four weeks of total use)
- Next 4 months
 - One 6 CY dump truck (four weeks of total use)
 - One 2 CY backhoe (four weeks of total use)
 - One 10 ton crane (four weeks of total use)
- Next 4 months
 - One 2 CY front end loader (six weeks of total use)
 - One 2 CY backhoe (six weeks of total use)
 - One 6 CY dump truck (eight weeks of total use)
 - One 130 hp pavers with tandem rollers (two weeks of total use)

Equipment will be used for an average of 7 hours per day, with an 8 hour per day maximum. The remaining equipment to be used will be handheld and powered by portable generators (concrete diamond saws, drills, etc.).

PERMITS AND APPROVALS REQUIRED

As part of the SRF process, federal agencies must have adequate review of environmental documents. The project must demonstrate compliance with Section 106 of the National Historic Preservation Act, the Federal Clean Air Act, and the Federal Endangered Species Act (ESA). This project will require consultation and approvals from the US Fish and Wildlife Service, the Northern Sierra Air Quality Management District (AQMD), and the State Historic Preservation Office.

The project does involve ground disturbance and according to deed restrictions, the City must get approval from the Department of Toxic Substance Control (DTSC) prior to any excavation on the site.

The project will not require any permits from the California Department of Fish and Game or any additional permits from the Central Valley Regional Water Quality Control Board.