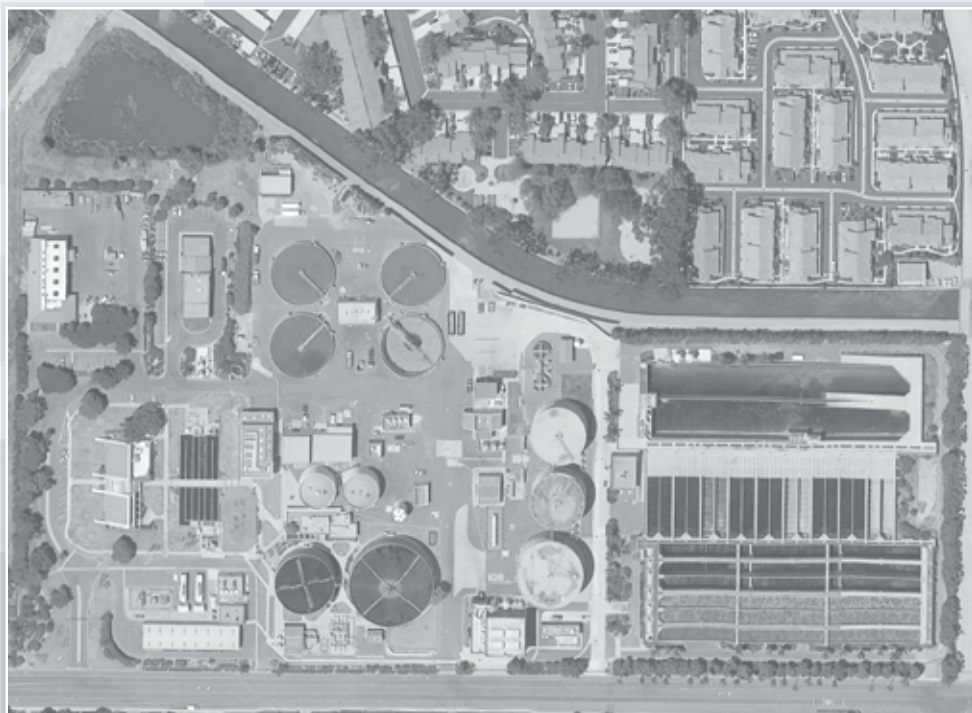




December 12, 2015
&
December 16, 2015

Oxnard Wastewater Treatment Plant

6001 SOUTH PERKINS ROAD
OXNARD, CALIFORNIA



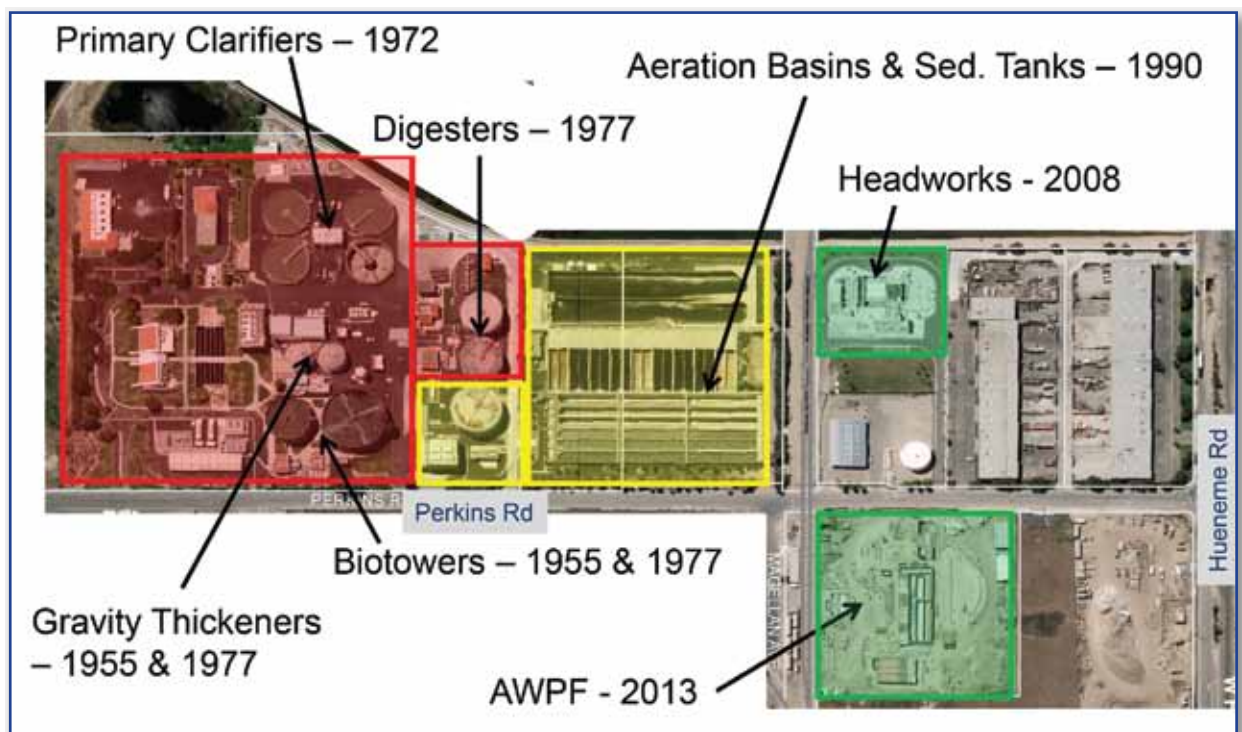
Overview:

Oxnard Wastewater Treatment Plant:

The City of Oxnard (City) Wastewater Treatment Plant (OWTP) is located at 6001 South Perkins Road. The OWTP provides secondary wastewater treatment and was designed to treat 31.7 million gallons per day (mgd). Secondary treatment uses biological processes to catch dissolved organic matter. Microbes consume the organic matter as food, converting it to carbon dioxide, water, and energy. Currently the flow to the OWTP ranges from 19 to 21 mgd. The plant runs 24 hours a day 365 days a year. The OWTP includes the following major treatment facilities:

The OWTP was constructed in the 1950s, although many of the current facilities were installed during major improvements constructed in 1975 and 1987. The new Headworks facility was constructed in 2006.

- Preliminary treatment (Headworks) including mechanically cleaned bar screens, aerated grit removal, and influent pumping
- Primary sedimentation
- Biotowers
- Inter-process pumping
- Fine-bubble activated sludge
- Secondary sedimentation
- Secondary effluent equalization
- Chlorination and dechlorination
- Effluent pumping and ocean outfall
- Emergency standby power generators
- Anaerobic digestion
- Solids processing facilities
- Onsite cogeneration facilities



1. Emergency Standby Generators:

Description:

In 2000 the City acquired two salvaged Vietnam era mobile diesel power generators from the United States Navy. These generators are used to provide power in the event of a power failure. During a Southern California Edison (SCE) power outage, the following sequence of activities will be initiated to provide emergency standby power to a portion of the wastewater treatment plant:

- The plants control center detects a loss of power
- The control center automatically starts the emergency standby power generators
- The appropriate breakers are automatically closed to transfer emergency standby power to the plant electrical distribution system
- The standby power generators start and will now power a portion of the wastewater treatment plant
- The plants control center ensures that the cogeneration facility remains on line by controlling the delivery of power to the different areas of the plant.

Issues:

Recently, the emergency standby generators failed to start automatically after a power outage. The standby generators are a challenge to maintain because it is often difficult to find parts that are 50 years old.

Recommendation:

Install two new standby generators for full plant power back up to meet regulatory reliability requirements.



2. Main Switchgear Building:

Description:

The Main Switchgear Building was constructed in 1977. The Main Switchgear Building houses two transformers, manual transfer switches, and motor control centers. These components are necessary for ensuring that the plant has proper power distribution. Power supply to the wastewater treatment plant is made up of the following components:

- Electric power provide by Southern California Edison
- On-site cogeneration facility consisting of three generators fueled by a combination of digester gas and natural gas or propane gas (two generators are normally operating and one is on standby mode)
- Backup emergency power from two diesel fueled standby generators (one is on standby mode)

Issues:

The Main Switchgear Building does not meet current earthquake building standards. The equipment is antiquated and there is the potential for it to arc and electrocute someone standing nearby. The building is also subject to flooding which can pose additional electrical hazards.

Recommendation:

Replace new Main Switchgear Building and upgrade electrical equipment for safety and performance requirements.



January 2010



3. Biotowers:

Description:

The lower concrete portion of the biotowers was constructed in 1955 to serve as the original plant's primary clarifiers. Primary clarifiers separate and settle out inorganic and heavy solids material. As part of the 1975 plant improvements, the clarifiers were converted to biotowers by constructing masonry walls on top of the concrete structures. Biotowers are secondary treatment facilities that remove organic materials from the wastewater.

Issues:

The biotowers are failing due to: cracking, staining, the leaking of raw wastewater, and deteriorating concrete masonry. The loss of concrete surface is significant in some areas. Vegetation feeding on the wastewater can be found growing through cracks in the walls.

Recommendation:

Decommission and demolish biotowers for safety and performance reasons.



4. Aeration Basins:

Description:

The aeration basins were installed in 1987. The activated sludge process treatment utilizes aeration basins, air diffusers, blowers, fine bubble ceramic dome diffusers, PVC air distribution piping, and air monitoring and control system. Aeration basins, like biotowers, are used to remove organic materials. However, the aeration basins are newer technology and can remove the materials more efficiently.

Issues:

Air diffusers, blowers, and air distribution piping are more than 25 years old and many parts are showing the effects of age. The computerized control system will not operate in automatic mode, which increases the chance for errors. The structures are not adequately reinforced to protect against earthquakes.

Recommendation:

New SCADA system, blowers, diffusers, and air distribution piping. Seismic retrofit of existing structures that includes tank resurfacing.



5. Anaerobic Digesters:

Description:

The OWTP employs three anaerobic digesters to break down biodegradable materials in the wastewater solids. This helps to make the solids more suitable for disposal and it also produces methane gas, which is used in the cogeneration plant. Digesters #1 and #2 were constructed in 1975 and digester #3 was built in 1987. The OWTP operates two digesters and uses one as standby.

Issues:

Digester #2 has not been operational since 2012 due to the failure of its roof. Because of this digesters #1 and #3 cannot be taken out of service for routine maintenance, which is causing them to deteriorate more rapidly. Heat exchangers, gas tubing, and recirculation pumps are more than 25 years old and will need replacement soon.

Recommendation:

Phased replacement of existing digesters and ancillary equipment to meet regulatory, reliability, and performance requirements.



6. Secondary Sedimentation Tanks and Flow Equalization Basins:

Description:

The OWTP utilizes rectangular sedimentation tanks for secondary clarification to settle and collect activated sludge generated in the aeration basins. Eighteen rectangular basins (18) were installed with the 1987 plant improvements, with room for three additional future sedimentation tanks. Two equalization basins were constructed with the 1987 plant improvements. The basins have a storage capacity of 5 million gallons. The basins are used to hold secondary effluent until it can be pumped through the outfall pipeline at a lower power cost

Issues:

Sedimentation tanks which collect solids, are more than 25 years old and many are suffering from the effects of corrosion. The flow equalization basin and secondary sedimentation tanks have also deteriorated to the point where they may not withstand an earthquake.

Recommendation:

Concrete repair for both structures. New chain and flight mechanisms and a new coat of paint for the sedimentation tanks. Seismic reinforcement of the flow equalization basin walls.



7. Primary Clarifiers:

Description:

The OWTP has four (4) circular primary clarifiers. Primary clarifiers settle out inorganic and heavy solids material. The initial structures were constructed in 1975 and were refitted 1987.

Issues:

Significant corrosion can be seen on the interior steel equipment of the clarifiers. The walkway has significant corrosion and for safety reasons workers use it sparingly. The majority of the primary clarifier equipment is in need of replacement.

Recommendation:

Phased replacement of the primary clarifiers to meet reliability and performance requirements.



8. Cogeneration Facility:

Description:

The OWTP has three (3) cogenerators for power generation. The cogenerators were installed in 1977. Each cogenerator can produce up to 500 KW of power. To increase plant efficiency the engine cooling water and exhaust heat are also used for digester heating.

Issues:

The cogenerators are more than 25 years old and need to be rebuilt. The existing control system is outdated and the building roof leaks. The building also does not currently meet earthquake standards.

Recommendation:

Rebuild cogenerators and upgrade control system to meet reliability and performance requirements. Replace the cogenerator building roof to address immediate concerns and plan to construct a new building in the future.

