LRWRP October 2009 aerial photo, Cook's Photography & Design.

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City of Lompoc

Self Guided Plant Tour

CITY OF LOMPOC
REGIONAL WASTEWATER
RECLAMATION PLANT

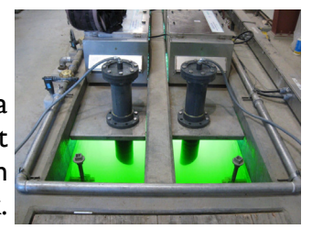
Wastewater Characteristics

The City receives wastewater from homes, schools, business, and industrial processes (wineries, medical, dental, veterinarian) from the City of Lompoc, Vandenberg Village, and Vandenberg Air Force Base. Pollutants, or constituents, in wastewater are usually measured in parts per million (ppm) or milligrams per liter (mg/L). It is estimated that the average American produces approximately 100 gallons of wastewater per day (US EPA).

Wastewater Treatment: Perfecting the Natural Process

The wastewater treatment process speeds up naturally occurring processes in water in a controlled environment. Normally, bacteria living in a stream of water consume or feed on the waste and oxygen in a stream. The stream maintains a certain level of dissolved oxygen by absorbing the oxygen in the atmosphere and from aquatic plants. In the Wastewater Treatment Plant, blowers provide air to the treatment process for bacteria to thrive. There is an optimum balance of bacteria, oxygen and waste required to ensure the natural process occurs. Since some of the pollutants that enter the Treatment Plant cannot be removed by bacteria alone, further disinfection treatment is required. The City uses ultraviolet (UV) light to ensure disease-producing (pathogenic) bacteria and organisms are not discharged back into the environment. The treated water is released to the environment and reintroduced to the water cycle for continued use.

Regulations



The City of Lompoc Regional Wastewater Reclamation Plant has a National Pollutant Discharge Elimination System (NPDES) Permit with the California Regional Water Quality Control Board, which allows the City to release treated water into San Miguelito Creek. The City is required to measure specific pollutants in wastewater before, during and after treatment.

Design Parameter	Design Capacity	Constituent	Discharge Limits
Average dry weather flow (MGD)	5.5 MGD	Biochemical Oxygen Demand (BOD), monthly average	30 mg/L
Peak dry weather flow (MGD)	9.5 MGD	Total Suspended Solids (TSS), monthly average	30 mg/L
Peak wet weather flow (MGD)	15.0 MGD	Settleable Solids (SS), monthly average	0.1 mg/L
Biochemical Oxygen Demand (BOD)	330 mg/L	Unionized Ammonia, weekly average	0.025 mg/L
Total Suspended Solids (TSS)	292 mg/L	pH instantaneous	6.5 - 8.3
Total Kjeldahl Nitrogen (TKN)	45 mg/L	Nitrate, Daily Maximum	10 mg/L
Ammonia Nitrogen	30 mg/L	Most Probable Number (MPN), 7-day running median	23
Total Phosphorus	8 mg/L		

Solids handling (S) | Liquids handling (L)

Returned Sludge

1 **Preliminary treatment** → 2 **Influent Pump Station (IPS)** → 3 **Grit removal** → 4 **Oxidation ditches** → 5 **Secondary clarifiers** → L1 **Secondary Effluent Equalization Tank (SEET)** → SEEPS → L2 **Filtration** → L3 **Ultraviolet (UV) disinfection** → L4A **Discharge**

WML Pump

S1 **Dissolved Air Flotation Thickener (DAFT)** → S2 **Aerobic Digesters** → S3 **Lagoons** → S4 **Drying bed** → S5 **Land application:** Once the sludge is dried to 5 - 10% moisture, it is hauled off for composting.

L4B **Irrigation:** the reclaimed water is reused for irrigation at the Plant.

1 – **Preliminary treatment:** bar screens are used to remove large objects like sticks, rags, plastic, rocks, toys or trash to protect downstream processes.

2 - **IPS:** Four variable speed nonclog mixed flow vertical column pumps are used to pump raw sewage into the Plant for treatment.

3 - **Grit removal:** flow from the IPS enters the grit removal system where heavier, inorganic material (grit) is removed before it enters the oxidation ditches. The grit is washed, dewatered, and disposed at the City's landfill.

S1 - **DAFT:** sludge is pumped to the DAFT by the waste mix liquor (WML) pumps where final conditioning is done before treatment in the aerobic digesters.

S2 - **Aerobic Digesters:** thickened sludge from the DAFT is pumped to the aerobic digesters where the last stages of digestion or break down can occur.

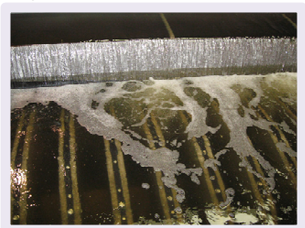
S3 - **Lagoons:** location where digester sludge is pumped to age for one year.

S4 - **Drying bed:** aged sludge is pumped from the lagoons to the drying bed where sludge dries.

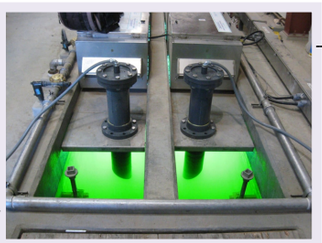
4 - **Oxidation Ditches (OD):** liquid waste stream from the grit removal system flows to the oxidation ditches where blowers provide air for the oxygen-breathing (aerobic) microorganisms start to break down organic matter and nutrients thereby removing pollution.

5 - **Secondary clarifiers:** the waste stream flows from the oxidation ditches and splits into three secondary clarifiers where heavier material (sludge) sinks and lighter material (scum) floats and is further treated. Settled sludge is returned to the OD.

L1 - **SEET/SEEPS:** temporarily stores wastewater when the flow exceeds 5.5 MGD. When the flow falls below 5.5 MGD, the SEEPS pumps the wastewater to the filtration/ultraviolet (UV) disinfection systems.



L2 - **Filtration:** the waste stream passes through filters to condition the water and allow the UV light to properly disinfect.



L3 - **UV disinfection:** UV light kills pathogenic bacteria and viruses in the waste stream by destroying their cellular genetic material preventing cell replication.

L4A - **Discharge or Outfall:** the reclaimed water is released into Miguleto Creek.

CITY OF LOMPOC REGIONAL WASTEWATER RECLAMATION PLANT

LOMPOC CALIFORNIA CITY OF ARTS & FLOWERS