

# Process Information

## PRELIMINARY TREATMENT

**Mechanically Cleaned Bar Screens** remove large objects such as rocks, metal objects and other material that could either clog or damage downstream equipment.

Aerated Grit Chambers remove grit and freshen raw wastewater by bubbling air through the wastes helping separate dense materials such as sand from the lighter organic matter. Grit that is relatively free of organic material is removed and landfilled.

**Parshall Flume** measures flow

## PRIMARY TREATMENT

**Primary Clarifiers** remove approximately half of the suspended solids (SS) and 30 percent of organic material from raw wastewater by settling. The material settles to the tank bottom, and the resulting sludge is pumped to holding tanks. Grease, oil and other floating matter (scum) are skimmed from the water surface and pumped to holding tanks.

## BIOLOGICAL NUTRIENT REMOVAL

**Biological Nutrient Removal System** removes such contaminants as fine solids, organic material, ammonia, phosphorus, and dissolved metals. The system includes bio-reactors and final settling tanks.

**Bio-reactors** provide an environment in which a living organisms, including bacteria and plankton (termed activated sludge) remove pollutants from the wastewater by feeding upon the organic matter and by absorption.

**Final Settling Tanks** allow the activated sludge formed in the bio-reactors to settle, removing the material from the treated water prior to further treatment.

## DISINFECTION

**Chlorine Contact Tanks** provide sufficient detention time for the treated wastewater to be disinfected using sodium hypochlorite. Following disinfection, the treated effluent is DE-chlorinated using sodium bisulfite prior to discharge into the Blackstone River.

## THICKENING AND DEWATERING

**Flotation Thickeners** reduce the water content of waste activated sludge (from the final settling tanks) concentrating it for further processing. In this operation, dissolved air floatation enhanced by polymer addition thickens the sludge while excess liquid is returned to the liquid process for treatment.

**Sludge Holding Tanks** provide storage and blending for the thickened waste activated sludge, primary sludge, imported sludges, and scum before further processing.

**Belt Filter Presses** further reduce the water content of sludge so that it may be efficiently burned, forming a cake of 20 to 25 percent solids. Polymers are also used here to enhance process performance. Each liquids are returned to the liquid process for treatment.

**Multiple Hearth Furnaces** thermally reduce the filler cake to an inert ash, which is then disposed of at our on-site landfill. Excess heat from this system is used for building heat.

### AIR POLLUTION CONTROLS

The contaminants in the exhaust from the multiple hearth furnaces are removed in an air pollution control system. The system is a state of the art process in which particulate matter, acid gasses, metals, and volatile organic compounds are either removed from the gas stream or thermally destroyed.

**Venturi Scrubber** removes some particulate matter and volatiles metals by liquid contact and condensation.

**Tray Scrubber** removes acid gasses and additional metals by liquid contact, absorption and chemical neutralization in a caustic spray system.

**Wet Electrostatic Precipitator** removes additional amounts of the fine particulate matter and associated metals not removed in the venture scrubber by liquid contact and condensation enhanced by electrostatic precipitation.

**Regenerative Thermal Oxidizer (RTO)** thermally converts volatile organic compounds to carbon dioxide by combustion of gasses at 1,400 degrees Fahrenheit (F).

**Stack** assures dispersion of off gasses by discharge through 125-foot high exhaust stack.

### OTHER PLANT FACILITIES

**Chemical Storage & Feed Building** provides for safe receipt and storage of liquid sodium hypochlorite and sodium bisulfate.

**Plant Water Building** houses pumps for the plant water supply.

**Maintenance Building & Annex** houses the machine shop, parts storage, garage space, a lunchroom, a locker and shower room, and offices for maintenance personal.

**Administration Building** houses the administrative, laboratory and engineering staff, the laboratory and the board room.

**Standby Power Generators** provide emergency power to operate preliminary treatment and disinfection in case of a power failure.

**Water is Worth it...**