
MEMORANDUM

TO: EILEEN M. CASHMAN
FROM: FELIX CHAVEZ
SUBJECT: REVIEW OF THE ARCATA WASTEWATER TREATMENT PLANT TOUR
DATE: SEPTEMBERMEBER 30TH, 2016

Purpose

The purpose of this memorandum is to offer a review of the tour that was held on September 30th, 2016 during the 2pm lab at the Wastewater Treatment plant in Arcata. The Plant's treatment train, problem's the plant faces, and updates to the plant.

Discussion

The Arcata Wastewater Treatment Plant's tour was led by an Operator of the Arcata Wastewater Treatment Plant. The plant receives about 1.2 million gallons of wastewater with an average BOD of 200mg/L.

The tour began with a small discussion where Students learned about what kind of problems the plant faces, such as in times when HSU students are away the water levels get so low that it makes some of the water sit still in the sewage pipes for long periods of time. The water sits until the water levels rise again allowing it to move. The tour guide also gave a bit of history of the plant involving a mill that had to pay for repairs to the plant due to wood glue clogging and causing malfunctions to the plant. That Wood mill is now closed.

The operator then led the tour to the headworks where students got the chance to see two large screw pumps move the water vertically allowing gravity to let the water flow through the bar racks and into the grit chambers. Here they discussed about the purpose of the bar racks which are the first device to remove large-solid objects from the wastewater. To keep them from getting clogged, the Arcata wastewater plant uses mechanical device that collects all the debris and moves it into a garbage bin to be disposed of. In the grit chambers, the water is allowed to sit in order to allow smaller objects such as sand and glass to settle using gravity. The tour guide talked about how paper products, condoms, and baby wipes that are flushed can cause the system to clog.

From the headworks, students were able to see an overview of the primary clarifier where wastewater is pumped into and solids are allowed to settle again. Here a sludge rake collects all the solids at the bottom and some that may still be floating. The water is then slowly flows out and put into oxidation ponds. After the wastewater leaves the primary treatment its BOD measures about 60mg/L (about a 50-60% reduction).

Compared to other treatment plants, Arcata uses oxidation ponds instead of an activated sludge system. In these ponds the water is being treated through a biological process. The water is allowed to sit out under the sun and allow algae to grow providing oxygen for microorganisms that degrade BOD. Treatment wetlands are part of the secondary treatment just like the oxidation ponds. The purpose of the wetlands is to remove the algae in the water from the ponds. The wetlands reduce nutrients before allowing the water to be released into the chlorination tanks. Here the plant

faced a problem where sludge would build up at the bottom. A group of engineers have come up with a solutions by using Blue frog technology to reduce the amount of sludge in the wetlands. So far only wetland #3 has a Blue Frog in use. The plant also has Enhancement Wetlands that serve as tertiary treatment by reducing the nutrient content by allowing microorganisms to consume contaminants.

As the tour ended students got a quick view of the chlorination tanks where water is disinfected using chemicals. The water is then chlorinated twice and dechlorinated twice before being released into the bay. The water being released must average a BOD of 30mg/L over a period of a month. That said, the water's BOD may never be 60+ mg/L on a single day.

Conclusion

The Arcata Wastewater Treatment Plant's tour offered students a more in depth look into the treatment train and the process involved within each category. Students were also allowed to see the blue frogs that are being tested in Wetland #3 although they had malfunction and didn't allow them to see it in action.