MEMORANDUM

TO: DR. MARGARET LANG
FROM: GABRIEL GARCIA
SUBJECT: ARCATA MARSH TRIP
DATE: OCTOBER 7, 2016
CC: DR. EILEEN CASHMAN

PURPOSE

The purpose of this memo is to review the Arcata Marsh Wastewater Treatment Plant field trip on September 30, 2016.

DISCUSSION

We arrived to the Arcata Marsh Wastewater Treatment Plant around 9 a.m. It was clear and sunny and the first thing brought to my attention was the drying beds in which the sludge is laid out on to dry to later become composted. Shortly after exiting the bus, we were greeted by one of the five plant operators. She provided us with some history of the plant, stating that (in 1949) it used to only have primary treatment; until 1957, when oxidation ponds were added as a means of secondary treatment. The plant operator discussed plans for the future, informing us of the possible replacement of the chlorine disinfection with a U.V. disinfection system.

We started at the headworks and examined the large dumpster bins that collect all the debris that gets filtered out of the wastewater by the bar racks and grit chambers. We then examined the bar racks that are on the bottom of the large Archimedes Screw Pumps. The first thing brought to my attention as we walked up alongside the Archimedes Screw Pumps was the pungent smell. I learned that the smell came from the presence of hydrogen sulfide in the wastewater.

From the headworks, we made our way to the primary clarifier, where I learned how the water was being brought into the tank and allowed the suspended solids to settle. I also learned how the grease is removed from the water by skimming the surface. From the primary clarifier, we were directed towards the digester. I was told that this anaerobic digester breaks down sludge by keeping the temperature at optimum temperatures for the bacteria that feed on the sludge to thrive. I learned that the cap of the tank is allowed to "float" to allow the fluctuating levels of methane gas to not build up too much pressure.

The plant operator then escorted us to the oxidation ponds. She mentioned that they were there to allow bacteria to feed on the small organic material in the presence of oxygen. She made it clear that Hydrocotyle is a constant struggle because too much of it blocks out the sun from the algae that use it to make oxygen for the microorganisms to metabolize the organic solids.

Finally, we were brought to the treatment wetlands. In the treatment wetlands, it was brought to my attention that there is still suspended solids (like algae), BOD, Ammonia, Nitrogen and Phosphorus that need to be reduced to meet the 30 mg/L TSS and 30 mg/L BOD_5. Here I learned that a lot of the excess unwanted contaminants are filtered through before discharging into the bay. I learned that the roots of Cattail and other native wetland plants capture the excess and do a good job but was starting to lose their effectiveness. Swaths of vegetation were cutout of the wetland to try and break up the sludge caked in the bottom by a weird looking water jet called a "blue frog." Their effectiveness is up to closer examination according to Dr. Cashman.

CONCLUSION

I got a better perspective as to what becoming an environmental resources engineer may entail. I came in this program thinking that I would be mostly dealing with renewable energy. I didn't even realize that water quality was part of environmental resources engineers' job description. Now that I am exposed to it, I feel that it is a good field to know because it interesting and everyone generates wastewater, so that market will always need workforce.