

TO: Professor Eileen Cashman and Professor Margaret Lang

FROM: Jacob Gellatly ENGR 115

SUBJECT: Arcata Wastewater Treatment Facility Field Trip

DATE: October 7th, 2016

#### Purpose

This memorandum is meant to explain the details of the ENGR 115 field trip to the Arcata Wastewater Treatment Facility on Friday September 30, 2016. The layout of the field trip, the questions asked of the class, and the goals met by conducting this field trip will be discussed in this memo.

#### Discussion

The ENGR 115 class attended the Arcata Wastewater Treatment Facility after completing their lectures on wastewater treatment, BOD, and sludge removal. The class was competent in identifying various stages in the wastewater treatment process, and in calculating overall BOD given any incoming tributaries BOD. The Treatment Facility was first introduced to the class through a series of Powerpoint slides that illustrated the various components of the treatment process, such as the headworks, the primary clarifier, and the oxidation ponds. Based on the demographics of the class, some students had already visited the facility, and for others it was their first visit. The field trip was conducted by an operator of the plant, and was supervised primarily by Professor Lang.

The tour began with a brief verbal description of the facility, and starting at the Archimedes screw pumps that brought raw sewage up into the headworks where the primary treatment began. From the top of the pumps, the class was told about how the system operated, and they were shown the primary clarifier from that pump station. The tour then took the class out to the oxidation ponds, where micro-organisms are grown to feed off of bacteria living in the wastewater. The tour guide explained how the hydrocotyle growing on top of the water must be removed in order to maintain the maximum photosynthetic capability of the ponds. Next the function of the treatment wetlands was introduced. The guide talked about how the roots from the wetlands had actually begun to float on top of the groundwater, which was now being addressed by the facility.

The tour concluded by demonstrating a new system being used called "Blue Frogs", that is a system that uses outward currents to increase biological

activity in the water. The class was required to answer a series of questions regarding the effluent intake of the plant, recent plant modifications, sludge management, quality standards, and BOD ratings.

#### Conclusion

The field trip succeeded in submerging the class in how an actual treatment facility operates, in order to better understand problems that may arise in designing one. The class was exposed to the working conditions of real life engineers in field study, and to the systems they will be learning more about and designing themselves.