

# Gabriel Pfeiffer

## Project Abstract - City of Albert Lea Wastewater Treatment Plant



### INTERN

**Gabriel Pfeiffer**

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### PROJECT FOCUS

Water

### ADVISOR

Joshua Kirk

### COMPANY

City of Albert Lea



### COMPANY DESCRIPTION

The City of Albert Lea Wastewater Treatment Plant (WWTP) serves a population of 18,200 and a variety of industries such as metal plating, food processing, truck washing, and biofuels processing facilities. The facility is an activated sludge plant, which uses a combination of mechanical and biological processes to remove solids, break down organic matter, and disinfect wastewater before discharging into the Shell Rock River.

## **INCENTIVE**

Components of wastewater such as ammonia and organic material have long been known to damage aquatic ecosystems. More recently it has been recognized that nutrients such as phosphate and nitrate have the capacity to damage aquatic ecosystems as well, causing algal blooms that reduce dissolved oxygen in receiving water bodies.

## **GENERAL APPROACH**

While the original design of the WWTP was not intended to remove nitrate and phosphate, modifications to treat these nutrients have the potential to reduce the impact of wastewater on aquatic ecosystems as well as reduce energy costs. In order to identify these modifications, the modeling software ASIM was used to simulate current plant conditions and test improvements.

## **FOCUS OF RESEARCH / RECOMMENDATIONS**

The focus of the improvements were optimization of sludge age, reconfiguration for biological nitrogen and phosphorus removal, and the optimization of aeration.