Chapter 1: Project Overview

Partner in Pollution Prevention Intern: Nathan Kreutzer
Major: Chemical Engineering
School: University of Nebraska-Lincoln

Company Background
McCain Foods was founded in 1957 with a specialty in appetizers by the McCain brothers Wallace, Harrison, Robert, and Andrew. Today McCain Foods spans worldwide with sales in more than 160 countries. The McCain's Grand Island location has 417 employees and produces over 400,000 pounds of different appetizers each day, including mozzarella sticks, fried jalapeños, cream-corn nuggets, French toast sticks, and a large emphasis on onion rings. This plant's main focus is onion rings ranging from beer battered to breaded.

Project Description
McCain Foods Grand Island is constantly looking for ways to become more economically friendly in order to leave a smaller carbon footprint behind. In the summer of 2019, McCain Foods sought after assistance from the University of Nebraska-Lincoln's Partner in Pollution Prevention Program to aid them in this mission. Nathan Kreutzer was sent to the plant with a focus on optimization of the battering process, as well as decreasing waste and energy costs.

Pollution Prevention Benefits
Batter control optimization was a goal for the summer, as well as reduction of energy usage. Throughout the summer, another pollution prevention, P2, opportunity was found in the wastewater treatment. Each of the recommendations made have an annual cost savings, but also include certain implementation costs with the exception of battering control.

Results
The pollution prevention benefits and results are summarized in **Table 1** below:

Table 1: Pollution Prevention Benefits and Results

P2 CATEGORY	ANNUAL COST SAVINGS	IMPLEMENTATION COSTS	PAYBACK (YEARS)	P2 BENNIFITS (PER YEAR REDUCED)
BATTERING CONTROL	$274,000	none	none	203 $MTCO_2$ 165,000lbs BOD & SS
INSTALLATION OF ECONOMIZER	$226,000	$454,000-$798,000	2-3.5	840 $MTCO_2$
WASTEWATER TREATMENT DAF ONLY	$214,000	$1,177,000	5.5	Water Contaminants
WASTEWATER TREATMANT BIOPROCESS H_2O	$473,000	$3,350,000	7.1	Water Contaminants
TOTAL	**$714,000 or $973,000**	**$1,631,000-$4,148,000**	**2.3-4.2**	**1040 $MTCO_2$ 165,000lbs BOD & SS**

Additional indirect or intangible benefits include:

- Reduced risk of ground water contamination
- Reduced need for boiler system chemical transportation