

Kerry Group



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Company Background

Kerry has over 200 sites that supply more than 15,000 foods, food ingredients, and flavors to food manufacturers worldwide. The Kerry Ingredients site in Rochester was purchased in 2004 and currently employs about 100 employees. This site focuses on functional and active ingredients, with a large focus on fermented ingredients, allowing Kerry to provide natural flavors, enhanced textures, and an extended shelf life. Other key manufacturing processes include spray drying, powder blending, and packaging. The ingredients and flavors produced at the Rochester facility may ultimately end up in ready-to-eat meals, sauces, dressings, dairy products, bakery products, or processed and fermented meats.



“This internship provided me with the opportunity to gain engineering experience in a food facility, to lead my own project, and to work collaboratively with various areas of the plant. I am so happy to have had such a positive and valuable experience and am excited to apply what I’ve learned to my future career.”

water and recycle it to the Zumbro River. Recent pH and BOD levels in excess of current permit limits have motivated Kerry to take action and find solutions to these overages. The company is dedicated to pollution prevention and, additionally, has the opportunity to save money through the reduction of wastewater loading and conservation of water.

Project Background

Thousands of gallons of wastewater are released to Kerry’s production floor every day following production processes and equipment wash-downs, draining to the sewer. Process materials that end up in the wastewater stream may cause high biological oxygen demand (BOD) and pH excursions that have negative effects on the environment and may require enhanced treatment at the local wastewater treatment facility and result in increased cost to the business. I examined sources of extreme pH and high BOD and how they could be reduced to decrease wastewater loading and conserve overall water use in order to decrease Kerry’s total economic cost and environmental impact

Incentives To Change

Wastewater loading limits set by the Rochester Water Reclamation Plant require Kerry to be conscious of what ends up in the water that is discharged to the city. The higher the wastewater loading, the more treatment is required by the Water Reclamation Plant to clean the





Divert Solids From Spray Dryers

When the spray dryers are cleaned between product runs, a lot of built-up product is washed off the inside walls and ultimately sent to the drain, contributing to high BOD in the wastewater. By diverting the first rinse of each CIP to the effluent silo, close to 74,500 pounds of solids can be removed from the wastewater each year. Alternatively, a filter sock could be attached to the dryer during the first rinse of the CIP to catch a portion of the solids before being sent down the drain, saving about 13,500 pounds of solids per year.

Modify Wet Packaging Line

Some packaged liquid product cannot be sent out as product for reasons such as falling onto the floor, having a cap that is not tightly sealed, or not reaching the proper selling weight. The product from these bags is emptied down the drain. By finding ways to prevent product from being wasted, it is estimated that Kerry can save over 7,000 pounds of solids from entering the sewer pit each year.

Fix Water Leaks

There are several water leaks on frequently running equipment, which can cause a large amount of water to be wasted. By fixing various leaks in the CIP units, sterilizer, centrifuge, and dryer, it is estimated that over 943,500 gallons of water can be saved each year.



Solutions

Optimize CIP Processes

Clean-in-place (CIP) systems are frequently used to clean equipment efficiently between product runs. Each CIP involves caustic and acid wash cycles, and the chemicals used in the process eventually flow to the sewer pit, contributing to pH spikes. By optimizing the timing of the CIP cycles, Kerry can decrease the number of pH excursions.

Clean Out Sewer Pit

Kerry's sewer pit collects all of the wastewater from the plant before it gets sent to the Water Reclamation Plant for treatment. Currently, the pit is over half full with sludge, resulting in a lower residence time in the pit with less opportunity for pH neutralization. By cleaning out the solids from the sewer pit, it is estimated that the average hold time in the pit can be increased from 20 minutes to over 4 hours. This will allow the chemicals more time to mix and neutralize, potentially reducing the number of pH excursions each month.

Recommendation	Reduction	Annual Savings	Status
Optimize CIP processes	Reduce pH excursions	\$550	Recommended
Clean out sewer pit	Reduce pH excursions	Unknown	Partially implemented
Divert solids from spray dryers	30,000 lbs of solids	\$6,000	Needs further analysis
Modify wet packaging line	7,000 lbs of solids	\$30,000	Recommended
Fix water leaks	943,500 gallons of water	\$7,000	Partially implemented