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Company Background

Midwest Renewable Energy (MRE) is a dry-mill ethanol plant located in Sutherland, Nebraska. In the past, they have produced fuel-grade ethanol to be blended with gasoline. However, they have recently started the transition to producing USP grade ethanol to be used in hand sanitizer production. MRE produces approximately 25 million gallons of denatured ethanol annually. Additional co-products include wet distillers grain with solubles (WDGS), corn syrup, and corn oil. The wet distillers grain is used as an animal feed supplement, corn syrup is used as a feed additive, and corn oil is used in household kitchens.

Project Description

In the summer of 2020, Partners in Pollution Prevention (P3) intern Ashley Miller was assigned to investigate ways to reduce energy usage and waste generation at MRE. These recommendations are presented in the following document. Ashley Miller worked part-time on this project remotely with some visits to the plant over the course of 10 weeks.

Pollution Prevention Benefits

During the summer, five Pollution Prevention (P2) opportunities were recommended, and a steam trap survey was performed to identify failed steam traps. Each of the recommendations has associated implementation costs and annual cost savings presented in Table 1-1.

Table 1-1: Summary of Pollution Prevention Opportunities

P2 Opportunity	Annual Monetary Savings	Initial Investment	Payback Period	Annual Energy Savings
Steam Trap Maintenance Program*	$4,608	$1,340	0.3 years	1,956 MMBtu
VFD on RO Pump	$12,399	$784	0.06 years = 3 weeks	159,063 kWh and 388 kW
VFD on Boiler Fan	$8,565	$827	0.1 years = 5 weeks	131,625 kWh and 183 kW
Upgrading Boiler Burner and Controls	$30,873	$206,250	6.68 years	13,104 MMBtu
Install Economizer	$51,455	$69,750	1.36 years	21,840 MMBtu
*numbers are for first-year savings, following year savings are not as high (outlined in the report)				