Project Overview

Platte Valley Fuel Ethanol
Central City, Nebraska

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The Company

Platte Valley Fuel Ethanol (PVFE) is a relatively new US Bioenergy facility built by Fagen Construction. PVFE processes 46,000 bushels of corn per day producing 800 tons of modified wet distillers grain with solubles per day and 48,000,000 gallons of denatured ethanol per year. PVFE employs 35 people and operates 365 days per year. PVFE is currently undergoing an expansion that will double the production capacity of the facility.

Project Description

PVFE has the goal of being the benchmark facility in the ethanol industry in the region. To achieve this, PVFE maintains a close working relationship with the Nebraska Department of Environmental Quality and is continually striving to improve environmentally. To this end, an Environmental Management System (EMS) was designed and implemented at the facility. In addition, an EMS template was created to assist other US Bioenergy facilities with EMS implementation. A third P3 project investigated methods to reduce phosphorus and sulfur concentrations in the distillers grain co-products.

Pollution Prevention Benefits

To create higher production yields, reduce needed process water and increase the quantity of fermentable material entering fermenters, it was recommended that Platte Valley Fuel Ethanol use a high pH temperature stable alpha amylase enzyme. Consequently with less water required during the process, energy requirements are reduced for drying the distiller's grain co-products.

With the new enzyme, sulfuric acid addition into the process will be reduced resulting in the concentration of sulfur in the distiller's grain to be reduced. Anhydrous ammonia gas injection into the process is also eliminated, reducing the risk of employee injuries. Platte Valley will continue to investigate phosphorus reduction opportunities in the distiller's grain while educating cattle producers about manure management practices. Phytase enzyme addition into the process could potentially increase yeast growth, decrease alpha amylase enzyme doses, and convert phosphorus into a digestible form for non-ruminant livestock. However, additional research is needed on its applicability before implementation.

The EMS designed for Platte Valley will serve as a useful record-keeping tool in the future. The EMS is designed to identify environmental problems before they occur, allowing proactive action to prevent noncompliance. An EMS template was created for use at any US Bioenergy facility.

Results

The results of quantitative suggested pollution prevention recommendations are summarized in the table below. Some results that are not listed below include safety benefits by reducing sulfuric acid use and eliminating ammonia injection.

Project Summary Table

Pollution Prevention Opportunity	Potential Benefits	Potential Annual Savings
Sulfuric Acid Source Reduction	Reduce sulfuric acid handling and storage	71,900 gallons
Water Reduction	Produce more Ethanol with less water	5,800,000 gallons
Energy Reduction	Decrease energy required for drying co-products while increasing production	Un-quantified
Increase Production Efficiency	Increase production using less resources	$3,100,000