

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR, PERMIT SECTION
1021 N. GRAND AVENUE EAST
P.O. BOX 19276
SPRINGFIELD, ILLINOIS 62794-9276
217/782-2113

PROJECT SUMMARY
FOR A CONSTRUCTION PERMIT APPLICATION
FROM
SWI ENERGY, LLC.
FOR A
ETHANOL PLANT
IN ALTON, ILLINOIS

Site Identification No.: 119010AEH
Application No.: 06080067
Date Received: July 10, 2008

Schedule

Public Comment Period Begins: November 21, 2008
Public Comment Period Closes: December 21, 2008

Illinois EPA Contacts

Permit Analyst: Minesh Patel
Community Relations Coordinator: Brad Frost

I. INTRODUCTION

SWI Energy, LLC (SWI Energy), formerly Gateway Ethanol, LLC, has applied for a revision to the air pollution control construction permit for its new fuel ethanol plant in Alton. SWI Energy has requested that the permitted production capacity of the plant be changed to 66.0 million gallons per year, from 113.7 million gallons per year authorized by the original permit. These changes are proposed to reflect the different design of the plant as the SWI Energy has changed the design/build firm of the ethanol plant then originally permitted.

The Illinois EPA has reviewed SWI Energy's application for revised permit and made a preliminary determination that the application meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the proposed revision. However, before issuing this permit, the Illinois EPA is holding a public comment period to receive comments on the proposed issuance of a revised permit and the terms and conditions of the draft of the revised permit.

II. PROJECT DESCRIPTION

SWI Energy has requested to change the permitted capacity of its new ethanol plant. The change in the production capacity of the plant is due to change in the design of the plant. As originally permitted, the revised plant would have the corn received by the rail or truck and screened for rocks and cobs before sent to storage bins. Corn is then transferred to a surge bin by conveyor and metered to a hammermill by a weigh belt feeder.

The ground corn is then sent to enzymatic processing. In the enzymatic process ground corn is turned into fine slurry by adding water, heat and enzymes. The fine slurry is then sent to liquefaction process where other enzymes are added to convert the starches into glucose sugars. Next the corn slurry is sent to fermentation process where yeast is added to begin the fermentation process.

Distillation system is utilized to separate the alcohol from the corn mash. Both streams are routed to the dehydration equipments to extract the ethanol. Ethanol is further refined to have 200 proof ethanol alcohols in molecular sieve. The ethanol is stored and denatured prior to sent out to customers. Mash stream from the dehydration equipments are sent to solids separation and evaporation equipments where excess water is removed to have "wet cake". The water, "thin stillage" is pumped to an evaporator to produce thick syrup. The wet cake and thick syrup are conveyed to dryers to remove moisture and produce dried distillers grain with solubles (DDGS). The DDGS is conveyed to a storage area for cooling and readied for shipment via rail car or truck.

The revised design of the plant would use one dryer system (steam tube dryer and cyclone combination in series) to dry all wet cake produced at the plant. The dryer system uses the steam produced by the boiler to dry the feed as it would not have auxiliary burners. The dried feed is then cooled as it is being conveyed to the feed storage area prior to shipping to customers.

One natural gas fired boiler would provide the steam for the ethanol production process including feed dryer system. The boiler and oxidizer would be equipped with low NO_x burners.

A non-contact wet cooling tower would be used for process cooling. The PM emissions from cooling tower are controlled by mist eliminators.

Equipment components, such as valves, flanges, pump seals, etc., involved with fermentation and subsequent handling of ethanol and denaturant generates VOM emissions when they leak. These emissions will be minimized with a Leak Detection and Repair (LDAR) Program, which requires regular inspections of component for leaks and timely repairs of any leaking components.

Fugitive dust and particulate matter emissions are generated by vehicle traffic and wind blown dust on roadways, parking lots and other open areas at the plant. These emissions would be minimized with a Fugitive Dust Control Program as well as pavement of new roadways and the parking lots for the facility.

III. PROJECT EMISSIONS

The proposed changes to plant design would use appropriate equipment for effective control of emissions from the various operations at the plant as originally permitted. Fabric filters would be used to control particulate matter emissions from the principle grain handling operations at the elevator and from milling of grain. Filters would also be used to control particulate matter emissions from the feed cooling conveyor and feed load out operations.

A scrubber would be used to control organic material emissions from the fermentation operations. The organic material laden water from this scrubber would be reused at the plant, so that the scrubber would not be a source of wastewater.

Combustion control, with natural gas fired thermal oxidizer, would be used to control emissions of organic material, carbon monoxide and particulate matter from the feed drying system. This oxidizer system would also be used to control emissions from certain emission units in the mash preparation and distillation operations as originally permitted.

As a result of this emission control equipment and other equipment and control measures that would be used at the source, the plant would not be classified as a major source under either the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21 or Illinois' Clean Air Act Permit Program (CAAPP) pursuant to Title V of the Clean Air Act. This is because the annual emissions from the plant would be limited to no more than 98 tons of each criteria pollutant (particulate matter, nitrogen oxides (NO_x), carbon monoxide, etc.), 9.5 tons of any single hazardous air pollutant¹ and 20 tons of total hazardous air pollutants.² These limits are based on data for the maximum emissions of the proposed plant and represent its permitted emissions. Actual emissions of the plant would be less than these limits to the extent that the

¹ While most of the organic material emissions of the proposed plant would be ethanol, the plant would also have emissions of organic compounds, such as acetaldehyde, formaldehyde and methanol, which are listed as hazardous air pollutants by Section 112(b) of the federal Clean Air Act.

² The draft permit would limit emissions from the source to less than the thresholds for a major source under the Clean Air Act Permit Program (CAAPP), e.g., annual emissions of 100 tons or more of an individual criteria pollutant, with a margin of compliance to assure that the actual emissions of this source are both enforceably and practically constrained to levels below those at which it would be a major source required to have a CAAPP permit.

actual performance of the equipment is better than projected and the plant does not operate at its capacity.

IV. APPLICABLE EMISSION STANDARDS

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The plant should readily comply with applicable state emission standards (35 Ill. Adm. Code: Subtitle B).

Certain emissions units at the plant would also be subject to the federal New Source Performance Standards (NSPS), at 40 CFR 60, which the Illinois EPA administers for source in Illinois on behalf of the United States EPA under a delegation agreement. These units include the boiler (40 CFR 60, Subpart Db), product ethanol storage tanks (40 CFR 60, Subpart Kb) and component leaks in the distillation area (40 CFR 60, Subpart VV). These units should also readily comply with applicable NSPS standards and requirements.

V. APPLICABLE REGULATORY PROGRAMS

This plant is not considered a new major stationary source under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. This is because the potential emissions from the proposed facility, as limited by the revised permit, would be less than the major source thresholds for PSD.

VI. DRAFT OF REVISED PERMIT

The revised permit for the plant would contain limitations and requirements for the grain handling, fermentation system, distillation system, feed drying and handling, ethanol storage and loading, and boiler to help assure that the facility complies with applicable regulatory requirements. The draft permit would also identify measures that must be used as good air pollution control practices to minimize emissions.

The revised permit would include enforceable limits on emissions and operation of emission units to assure that plant remains below the levels at which it would be considered major for PSD or emissions of HAP. In addition to limiting annual emissions, the permit would also include limits on hourly emissions, annual ethanol production, and annual grain receipts. The permit would also establish appropriate compliance procedures for the plant, including requirements for emission testing, monitoring, recordkeeping, and reporting. Emission testing is required as part of the initial shakedown and operation of the plant after completion of construction.

These measures are being imposed to assure that the emissions of the plant are accurately tracked to confirm compliance with both the short-term and annual emission limits established for them.

VII. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the application for a revised permit meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue a revised permit.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions of the draft permit.