

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
LINCOLNLAND AGRI-ENERGY, LLC
FOR A
ETHANOL PLANT
NEAR PALESTINE, ILLINOIS

Site Identification No.: 033899AAA

Application No.: 02080027

Date Received: August 14, 2002

Schedule

Public Comment Period Begins:

Public Comment Period Closes:

Illinois EPA Contacts

Permit Analyst: Minesh Patel

Community Relations Coordinator: Brad Frost

I. INTRODUCTION

Lincolnland Agri-Energy, LLC (Lincolnland) has proposed to construct an ethanol production facility near Palestine, Crawford County. The facility would produce 45 million gallons of ethanol per year. The construction of the proposed facility requires a permit from the Illinois EPA because of its associated air emissions.

II. PROJECT DESCRIPTION

The principal products produced at ethanol plants are ethanol and distiller grains. The distiller grains are the grains with soluble that can be used as an animal feed. The ethanol is ethyl alcohol, made primarily from corn and various other grains and can be used as an octane enhancer in fuel, an oxygenated fuel additive that can reduce the carbon monoxide emissions from the vehicle, or a non petroleum-based gasoline extender.

Lincolnland has proposed to construct 45 million gallon per year dry mill ethanol plant. In this process corn is received by the rail or truck and screened for rocks and cobs before sent to storage bins. From storage bins the corn are weight, ground and 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 liquifcation 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 process utilizes a vacuum distillation system 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 as final product. 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 wet cake is conveyed to one of the two dryers to have 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 principal air contaminants emitted from the proposed ethanol plant would be NO_x, CO and VOM. NO_x can be formed thermally by combination of oxygen and nitrogen in the air at the temperatures at which fuel is burned. Thermal NO_x is formed during the operation of all common high temperature combustion processes including boilers. NO_x can also be formed from the combination of any nitrogen in the fuel with oxygen. This is not relevant for burning of natural gas, which contains minimal amounts of nitrogen.

CO is formed by the incomplete combustion of fuel. CO is associated with most combustion processes and is found in measurable amounts in boiler exhaust. The boiler controls VOM emissions from the fermentation process and DDGS drying. VOM and PM/PM₁₀ are also emitted as a result of incomplete combustion of fuel. SO₂ is also found from combustion of natural gas.

III. PROJECT EMISSIONS

The annual emissions from the facility would be limited to 96.91 tons of NO_x, 99.68 tons of CO, 92.69 tons of VOM, 78.59 tons of PM/PM₁₀, and 0.60 tons of SO₂. These limits are based on the maximum emissions requested by Lincolnland. These limits are based on achievement of average annual hourly emission rate as specified by the manufacturer of the equipments, standard emissions factors, engineering estimates, and the potential utilization of the facility as specified by Lincolnland. Actual annual emissions of the facility would be less than these limits to the extent that the actual performance of the equipment is better than projected and the equipments are not utilized as much.

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 proposed facility will readily comply with applicable state emission standards (35 Ill. Adm. Code: Subtitle B).

The facility is also subject to the federal New Source Performance Standards (NSPS), 40 CFR 60 Subpart Db, for boiler. The Illinois EPA is administering NSPS in Illinois on behalf of the United States EPA under a delegation agreement. These standard addresses NO_x emission from boiler limiting NO_x emissions to 0.1 lb/mmmbtu. The boiler should readily comply with this standard.

V. APPLICABLE REGULATORY PROGRAMS

This facility 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 permit, would be less than the major source thresholds for PSD.

VI. PROPOSED PERMIT

The conditions of the draft permit for the facility contain limitations and requirements for the grain handling, fermentation system, distillation system, feed drying/cooling, ethanol storage/loading, and boiler to help assure that the facility complies with applicable regulatory requirements. The draft permit also identifies measures that must be used as good air pollution control practices to minimize emissions from the turbines and duct burners.

The draft permit includes enforceable limits on emissions and operation for the equipments to assure that facility remains below the levels at which it would be considered major for PSD. In addition to limiting annual emissions, the permit also includes limits on hourly emissions, annual ethanol production, and annual grain receipts.

The permit also establishes appropriate compliance procedures for the facility, including requirements for emission testing, monitoring, recordkeeping, and reporting. Emission testing is required as part of the initial shakedown and operation of the facility after completion of construction.

These measures are being imposed to assure that the emissions of the facility 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 proposed permit meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue this permit.

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