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PROJECT SUMMARY
FOR A
CONSTRUCTION PERMIT APPLICATION FROM
The Andersons Marathon Ethanol, LLC
FOR A
FUEL ETHANOL PLANT IN
CHAMPAIGN, ILLINOIS

Site Identification No.: 019809AAC
Application No.: 06050063
Date Received: May 16, 2006

Schedule

Public Comment Period Begins: January 8, 2007
Public Hearing: February 27, 2007
Public Comment Period Closes: March 29, 2007

Illinois EPA Contacts

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I. INTRODUCTION

The Andersons Marathon Ethanol, LLC (The Andersons) has submitted an application to construct a fuel ethanol plant in Champaign. The construction of the proposed plant requires a permit from the Illinois EPA because the plant would be a source of emissions.

The Illinois EPA has reviewed The Andersons' application and made a preliminary determination that the application for the proposed project meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the proposed plant. However, before issuing this permit, the Illinois EPA is holding a public comment period with hearing to receive written and oral comments on the proposed issuance of a permit and the terms and conditions of the draft permit.

II. PROJECT DESCRIPTION

The Andersons has proposed to construct a plant to produce ethanol from corn. The plant would be designed to have a nominal capacity of 118 million gallon per year, with the ability to actually produce up to 125 million gallons of ethanol per year. The denatured ethanol produced by the plant would be used as motor vehicle fuel. When added to gasoline, ethanol is an octane enhancer and oxygenated fuel additive, which reduces hydrocarbon and carbon monoxide emissions in vehicle exhaust. The plant would produce ethanol by batch fermentation of ground corn, followed by processing to separate out and purify the ethanol. The plant would also produce animal feed from the stillage material remaining after the fermentation process. The plant would have facilities to ship out products (fuel ethanol and feed) by both truck and rail. Natural gas would be used as the fuel for the plant.

The proposed plant would be served by the existing grain elevator at the site, at which grain is currently received, stored, and shipped by truck and rail.¹ As part of this project, The Andersons is planning to add a filter system to control particulate matter (PM) emissions from four existing truck dump pits at the elevator, which would handle most of the grain for the plant. As a consequence, when the ethanol plant begins operations, actual PM emissions from the elevator should not significantly change from current levels, even though more grain would be received by the elevator than at present. Other than adding these control systems to the dump pits, the existing grain handling operations will not be physically altered as part of this project. Particulate emissions from other existing grain handling operations would continue to be controlled by enclosure, equipment design, fabric filters and good housekeeping practices.

The first step in the production of ethanol by fermentation is to prepare the corn. Corn would be transferred from the elevator to the ethanol plant with a new enclosed conveyor system (leg). The corn is first milled or ground, mixed with water, and heated, producing a fine slurry. Enzymes are then added to convert the starch in the corn into sugar. The resulting mash is then sterilized before being sent for fermentation.

In the fermentation process, yeast is introduced into the mash to convert sugar in the mash into

¹ The existing source also includes a bulk fertilizer plant at which solid fertilizer is received, stored, mixed to meet customer specifications and shipped by truck to customers. The fertilizer plant will not be affected by the development of the ethanol plant.

ethanol. Fermentation would be performed on a batch basis in seven separate fermentation tanks. The seven tanks would continuously cycle through the fermentation process. At any time, one tank would normally be undergoing the steps between a batch, i.e., transfer of the tank's contents to the beer well (where it is temporarily held while awaiting distillation), thorough cleaning of the interior of the tank with automated equipment (to prevent buildup of undesired microorganisms), and charging of the tank with fresh mash. Fermentation would normally be taking place in the other six tanks, one tank just beginning fermentation, one finishing up, and the other tanks at intermediate points in the process.

A distillation system would be used to separate the ethanol from the beer from the fermentation tanks. The ethanol would be further refined to water-free, 200 proof, ethanol using a molecular sieve. The ethanol would be denatured with natural gasoline, stored in floating roof tanks, and shipped to customers by both truck and rail.

The non-ethanol "stillage" recovered from the distillation system would be further processed to separate and recover water, which would be reused at the plant, and feed material. First, the whole stillage would be processed by centrifuges to mechanically recover solids, with the solids-rich thick stillage then sent to thermal dryers. The water-laden thin stillage from the centrifuges would be further processed with evaporators to separate and recover water, leaving behind nutrient-rich thick syrup. The thick syrup would also be dried with the thick stillage in the thermal dryers to produce animal feed, i.e., dried distillers grain with solubles or DDGS.

The proposed plant would have two natural gas-fired dryer systems, with total capacity to be able to fully dry all feed material produced by the plant. The plant would also have the ability to sell partly dried "wet cake," with 60 to 70 percent moisture, if there are customers for such material. Each dryer system would have two dryers in series followed by a natural gas-fired afterburner or oxidizer. In addition to controlling emissions of from feed drying (carbon monoxide, volatile organic material and particulate matter), each oxidizer would also function as a furnace for a boiler that would supply the steam needed for the operation of the plant.

III. PROJECT EMISSIONS

The proposed fuel ethanol plant would use appropriate equipment for effective control of emissions from the various operations at the plant. 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 from the feed cooler, in which hot feed from the dryer is cooled before being sent to storage pending shipment. A filter would also be used to control particulate matter emissions from the handling and load out of the dried feed.

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 oxidizers, would be used to control emissions of organic material, carbon monoxide and particulate matter from the natural gas-fired feed dryers, which complete the conversion of wet stillage into dry feed. These oxidizers, as well as

the natural gas fired dryers, would be equipped with low-NO_x burners to minimize nitrogen oxide emissions. The heat energy from this equipment would be recovered with the boilers, to supply the process steam needed to run the plant. The oxidizer/boiler systems would control most of the organic material emissions from feed cooling by using the majority of the exhaust from the feed cooler as combustion air for the oxidizer/boiler systems. These systems would also be used to control emissions from the distillation operations, in which the ethanol is separated from the beer from the fermentation tanks.

As a result of this emission control equipment and other equipment and control measures that would be used at the source, The Andersons has proposed to control emissions of the source so that it would not be a major source subject to the Clean Air Act Permit Program (CAAPP) after the start up of the fuel ethanol plant. Annual emissions from the source would be limited to no more than 98 tons of each criteria pollutant (particulate matter, nitrogen oxides (NO_x), carbon monoxide, etc.), 9.8 tons of any single hazardous air pollutant² and 24.5 tons of total hazardous air pollutants.³ 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 actual performance of the equipment is better than projected and the plant does not operate at its capacity.

In addition to stack emissions, the limits on the source's emission would address organic material emissions from leaking equipment components, such as valves, flanges, pressure relief devices, pump seals, etc., involved with fermentation and the subsequent handling of product ethanol. (These emissions would be minimized with a Leak Detection and Repair Program, with regular inspections of components for leaks and timely repairs of any leaking components.) The limits for particulate matter emissions also address fugitive dust generated by vehicle traffic and wind blown dust on roadways and parking lots at the source. (These emissions would be minimized by paving of plant roads and a Fugitive Dust Control Program.)

IV. APPLICABLE EMISSION STANDARDS

All emission units in Illinois must comply with State emission standards adopted by the Illinois Pollution Control Board (35 Illinois Administrative Code, Subtitle B, Chapter I, Subchapter c). These emission standards represent the basic requirements for units in Illinois. The emission units at the proposed ethanol plant should readily comply with applicable state emission standards.⁴

Certain emissions units at the proposed plant would also be subject to the federal New Source

² 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.

³ 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.

⁴ Pursuant to 35 IAC 212.462(b)(1), control systems for particulate matter emission, as proposed by The Andersons, must be installed and operated on the major dump pits for truck receiving of grain at the existing elevator. For major dump pits used for rail receiving of grain, pursuant to 35 IAC 212.462(b)(1) and (2), either particulate matter controls must be installed or equivalent measures used to control emissions, as are available for hopper bottom rail receiving of grain.

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 oxidizer/boiler systems (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 project is not considered a major project under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. This is because the emissions of each PSD pollutant from the proposed project, as limited by the permit, would be less than 100 tons per year, which is the relevant threshold for this project to be a major project under the PSD rules.⁵ The limitations that The Andersons has proposed to accept so that the source is not a major source subject to permitting under the CAAPP are more stringent than would be needed to maintain non-major status under the PSD rules. This is because this project would only be considered a major project under the PSD rules if the changes, i.e., the increase in emissions of one or more PSD pollutants from the project, would be major by themselves, as provided by 40 CFR 52.21(b)(1)(i)(c). For this purpose, certain emissions, e.g., the emissions of the existing bulk fertilizer facility at the site, would not need to be included in the determination whether the proposed project were a major project under the PSD rules.

VI. CONTENTS OF THE DRAFT PERMIT

The permit that the Illinois EPA is proposing to issue for the proposed plant includes a variety of requirements to ensure that the plant is properly constructed and operated. The permit contains limitations and requirements for the various operations at the plant and the existing elevator to help assure that the source complies with applicable regulatory requirements. The permit also identifies measures that must be used as good air pollution control practices to minimize emissions. The permit includes enforceable limits on emissions and operation to assure that this project would not be a major project subject to the PSD rules. In addition to limiting annual emissions of different operations, the permit also includes short-term limits on hourly emissions and requirements for proper operation of control systems. The permit also includes annual and monthly operational limitations on production of ethanol and feed and usage of grain natural gas.

The permit also establishes appropriate compliance procedures for the source, including requirements for emission testing, monitoring, recordkeeping, and reporting. These measures, which would be established by the permit to specifically address the proposed plant, are being imposed to assure that the operation and emissions of the source are accurately tracked to

⁵ The relevant applicability threshold for this project to be considered a major project subject to the PSD rules is an increase in potential annual emissions of 100 tons or more of a PSD pollutant from the project itself, pursuant to 40 CFR 52.21(b)(1)(i)(a) and (c). This is because this project is occurring at an existing source that is not a major source. In this regard, the existing source is a grain elevator whose potential emissions of particulate matter and other PSD pollutants are each less than 250 tons per year. However, because the proposed project would involve construction of a fuel ethanol plant, a type of plant that would currently be classified as a chemical process plant, the relevant applicability threshold for the project to be major is potential annual emissions of 100 tons or more of any PSD pollutant. This is the major source threshold under the PSD rules for certain listed categories of sources, including chemical process plants (but not including grain elevators), is potential emissions of 100 tons or more per year.

confirm compliance with all applicable requirements. The performance of the principal control systems would have to be tested after the plant is built. The Andersons would have to conduct operational monitoring and recordkeeping to confirm that the plant is properly operated and maintained on a continuing basis. These activities would be overseen by the Illinois EPA, which will review the various reports that the plant must submit and periodically conduct on-site inspections of the plant.

VII. REQUEST FOR COMMENTS

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

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