Illinois Environmental Protection Agency
Bureau of Air, Permit Section
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Project Summary for a Construction Permit Application from Archer Daniels Midland Co. for modifications to the West Corn Germ Plant in Decatur, Illinois

Site Identification No.: 115005AAE
Application No.: 07090062
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Schedule
Public Comment Period Begins: May 28, 2008
Public Comment Period Closes: June 27, 2008

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I. INTRODUCTION

Archer Daniels Midland Company ("ADM") currently operates a number of processing plants at its Decatur, Illinois complex. ADM has requested a construction permit to modify operations at the West Corn Germ Processing Plant at its Decatur complex.

The proposed modification will increase the capacity of the West Corn Germ Processing Plant by various measures including addition and replacement of several expellers, replacement of the existing extractor, replacement of an existing Desolventizer-Toaster-Dryer-Cooler (DTDC), and related changes of control systems, conveyor systems, and duct work. The plant, once the modification is completed, will be capable of handling approximately 1,200,000 tons of corn germ per year.

II. PROJECT DESCRIPTION

The planned project will result in a significant increase in volatile organic materials (VOM) emissions as defined by the PSD rules. VOM emissions will be controlled by design and work practices to recover VOM solvent, by a leak detection and repair program, and by use of add on controls.

III. PROJECT EMISSIONS

The potential or permitted annual emissions of this project, as would be allowed by the draft permit, are summarized below. Actual emissions will be less than the permitted emissions to the extent that the facility would operate at less than its maximum capacity and control equipment normally operates to achieve emission rates that are lower than the applicable standards and limitations.

Permitted Annual Emissions Increase of the Project (Tons/Year)

	PM[a]	PM10[b]	NO_x[c]	SO_2[c]	CO[c]	VOM
West Corn Germ Plant	16.08	13.31	8.69	16.94	2.08	112.93

Notes:
a. Particulate matter including condensable particulate as measured by USEPA Method 202.
b. Particulate matter less than 10 microns including condensable particulate as measured by USEPA Method 202.
c. Increase in emissions associated with increase natural gas usage at existing natural gas fired boilers.

IV. APPLICABLE EMISSION STANDARDS

The application shows that the proposed project will readily comply with applicable state and federal emission standards, including the emission standards and regulations of the State of Illinois (35 Ill. Adm. Code: Subtitle B) and applicable federal emission standards adopted by the United States EPA (40 CFR Part 60 and 40 CFR Part 63).

V. PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The proposed project is considered a major project under the federal rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21, for emissions of volatile organic material (VOM). The Illinois EPA has been delegated authority by the United States EPA to administer the

federal PSD program in Illinois. These rules are relevant for this pollutant because ADM's Decatur complex is located in a region whose air quality is classified as attainment for particulate matter, ozone, sulfur dioxide, nitrogen dioxide, and carbon monoxide.

Because the existing Decatur complex is already a major source of emissions, the criterion for whether the proposed project is considered major is whether the permitted emissions of the project for one or more pollutants regulated by PSD would qualify as significant, as defined by the PSD rules. The project meets this criterion for VOM with permitted annual emissions that are each greater than 40 tons. The project is therefore subject to the certain substantive requirements of the PSD rules for this pollutant. The potential annual emission increases of lead, fluorides, sulfuric acid mist, hydrogen sulfide, total reduced sulfur, reduced sulfur compounds, particulate matter, nitrogen oxides, sulfur dioxide and carbon monoxide associated with the project are less than 0.6, 3, 7, 10, 10, 10, 15, 40, 40 and 100 tons, respectively. Therefore, this project is not subject to PSD review for these pollutants.

The substantive requirement of the PSD rules for a major project for a pollutant are: 1) A case-by-case determination of Best Available Control Technology (BACT), 2) An ambient air quality impact analysis to confirm that the project would not cause or contribute to a violation of the National Ambient Air Quality Standard(s) (NAAQS) or applicable PSD increment(s); and 3) An assessment of the impacts on soils, vegetation and visibility.

A. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

ADM submitted a "top-down" BACT demonstration in its application reflecting its judgment as to the emission control technologies and associated emission limits that should be considered BACT under the PSD rules for various units at the West Corn Germ Plant. This demonstration addressed the new and modified units in the plant that emit those pollutants for which the project is a major modification (i.e., VOM). The BACT requirement of the PSD rules does not apply to existing units that are not being modified.

The Illinois EPA has reviewed the material submitted by ADM and made its independent determination of BACT. In addition to the material submitted by ADM, the Illinois EPA's determination of BACT relies upon its general knowledge of the types of operations at the proposed plant and specific information about existing plants with similar operations that are located in Illinois. As explained below, the Illinois EPA concurred with ADM's selection of control technologies as it reflected technologies that are in common use at similar plants and effectively control emissions.

Oil Extraction

In the corn germ processing plant, germ is received and conditioned in a preparation area prior to the solvent extraction process. Initially, oil is removed from the germ using expellers that mechanically press the germ. These initial processing steps do not emit VOM.

After further conditioning, the remaining oil is extracted from the germ using hexane (a VOM) as the extracting solvent in a counter-flow extractor system. This oil is then separated from the hexane. Residual hexane is also removed from the de-oiled germ meal, and the meal is further processed prior to shipment. Hexane recovered from these operations is reused in the extractor system.

Emissions of VOM from these operations, which are present from hexane losses, will be controlled by a hexane recovery system, a multi stage control system, and other practices to minimize loss of hexane. Modifications to the affected plant include modifications to the expeller system, replacing the existing extractor with a new extractor, and replacing one of the existing Desolventizer Toaster Dryer Coolers (DTDC) (i.e., the "West DTDC" designated EU GE-05) (The other DTDC, the "South DTDC" will continue in use unchanged).

There are three?? main sources of VOM emissions from the processing of germ: 1) the main vent, which vents vapors from the solvent extractor, solvent recovery system, and the desolventizer section of the DTDC; 2) meal processing; and 3) equipment leaks.

Potentially applicable control technologies are for these sources are:

Unit Description	Potential Controls
Main Vent	Condensation Condensation with mineral Oil absorption Carbon Adsorption Oxidation/Incineration
Meal Processing	Improvement in Desolventizing Carbon Adsorption Oxidation/Incineration
Equipment Leaks	Leak Detection and Prevention

As BACT, ADM is proposing the following controls for the above listed emission points:

Unit Description	Controls
Main Vent	Condensation with mineral Oil absorption
Meal Processing	Improvement in Desolventizing
Equipment Leaks	Leak Detection and Prevention

The controls proposed by ADM are the top ranked feasible technologies available for these processes.

B. AIR QUALITY ANALYSIS

An ambient air quality analysis was conducted by ADM to assess the impact of the emissions of the proposed project. Under the PSD rules, this analysis must determine whether the proposed project will cause or contribute to a violation of any applicable air quality standard.

The air quality analyses for VOM conformed to the current guidance and requirements of the USEPA and the Illinois EPA. The analyses indicate that this project will not cause or contribute to a violation of the air quality standards or PSD increments. For VOM, the modeled impact was determined to be below the applicable significant impact levels.

The analysis for ozone was conducted using a screening method developed by USEPA for PSD permitting to address the historic one-hour ozone standard. The analysis confirms that the project will not cause a violation of the ozone air quality standard. For this purpose, information on current air quality for ozone in the region is available from an ambient monitoring station operated by the Illinois EPA in Decatur, Illinois. These data show that air quality in the region complies with both the historic one-hour ozone standard and the current eight-hour ozone standard.

C. IMPACTS ON SOIL, VEGETATION AND VISIBILITY

The application addresses the potential impact of the proposed project on soils, vegetation, and visibility. The assessment concludes that the project would not adversely impact soil, vegetation or visibility. This is because the maximum air quality impact predicted for the project is de minimis, so that existing air quality should not be affected measurably by this project.

VI. PERMIT CONDITIONS

The conditions of the permit set forth the air pollution control requirements that the project must meet. These requirements include the applicable emission standards that apply to the project. They also include the measures that must be used and the emission limits that must be met as BACT for emissions of VOM from the modified facility.

The permit also establishes enforceable limitations on the amount of emissions for which the project is permitted. In addition to annual limitations on emissions, the permit includes short-term emission limitations and operational limitations, as needed to provide practical enforceability of the annual emission limitations. As previously noted, actual emissions associated with the project would be less than the permitted emissions to the extent that the facility operates at less than capacity and control equipment normally operates to achieve emission rates that are lower than the applicable standards and limitations.

The permit also establishes appropriate compliance procedures for the ongoing operation of the facility, including requirements for emission testing, required work practices, operational monitoring,

recordkeeping, and reporting. These measures are imposed to assure that the operation and emissions of the facility are appropriately tracked to confirm compliance with the various limitations and requirements established for individual emission units.

VII. REQUEST FOR COMMENTS

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

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