

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
1021 North Grand Avenue East
P. O. Box 19276
Springfield, Illinois 62794-9276
217/782-2113

Project Summary for
A Construction Permit Application from
Archer Daniels Midland, Decatur for
Installation of Steam Coils on Soy Product Dryers

Site Identification No.: 115015AAE
Application Nos.: 06030043

Illinois EPA Contacts:

Permit Analyst: Shashi Shah
Community Relations Coordinator: Brad Frost

Important Dates

Comment Period Begins: August 1, 2006
Comment Period Closes: August 31, 2006

I INTRODUCTION

Archer Daniels Midland Company (ADM) has applied to install steam coils on all six of the spray dryers in the Isolate and Functional Concentrate Departments at its Decatur manufacturing complex. Installing steam coils on these spray dryers is intended for the purpose of reducing natural gas usage. Preheating the incoming air with steam prior to the natural gas burners will allow ADM to reduce the firing rates of the burners. Production rates in the dryers will not be affected.

The Illinois EPA has prepared a draft of the construction permit that it proposes to issue for this project. However, before issuing a permit, the Illinois EPA is holding a public comment period to receive comments on the proposed issuance of a permit and the terms and conditions of the draft permit.

II PROJECT DESCRIPTION

ADM utilizes a variety of drying equipment to produce soy protein products, including six direct fired spray dryers that are used to produce powdered soy protein isolates and concentrates. Currently, these spray dryers use natural gas burners to heat the incoming air to the dryers. To reduce the energy costs, ADM plans to alter the dryers to reduce the usage of natural gas. The alterations will allow ADM to use steam generated by the coal-fired boilers to provide up to half of the heat currently supplied with natural gas.

The six dryers that are the subject of this project are: Isolate I-East, Center and West, Isolate II, Isolate III, and the Functional Concentrate with increased operation of boilers to supply the steam for the coils. Over recent years as the cost of natural gas has increased, so have ADM's production costs. Due to ADM's coal fired cogeneration facility, ADM has the capacity to utilize steam for preheating the air to the spray dryers prior to the natural gas burners. ADM calculates that the steam coils on the dryers will require about 200,000 pounds of steam total, on an hourly basis, from the coal fired boilers, equivalent to about 250 million Btu of additional heat input, to provide up to half of the heat for the spray dryers.

III PROJECT EMISSIONS

The emissions of the affected dryers are listed below.

<u>Contaminant</u>	<u>Current Actual Emission (Ton/Yr)</u>	<u>Projected Future Emission (Ton/Yr)</u>	<u>Change (Tons/Yr)</u>
Sulfur Dioxide(SO ₂)	0.6	0.4	-0.2
Nitrogen Oxides(NO _x)	74.4	41.3	-33.1
Carbon Monoxide(CO)	71.8	40.0	-31.8
Particulate Matter(PM)	14.4	11.7	-2.7
Volatile Organic(VOM) Material	4.7	2.6	-2.1

ADM has evaluated the potential emissions increase associated with the project and the results of this analysis are summarized below. As shown, the project emissions increase for VOM is below PSD significant emission rate thresholds. Thus, the proposed project does not constitute a major modification for VOM and is not subject to PSD review. The increase in other pollutants is significant, so PSD is triggered.

Summary of Emissions Changes from the Proposed Project

Process Area	Emissions Change (Tons per year)				
	PM	VOC	NOx	CO	SO ₂
Dryers ^a	-2.7	-2.1	-33.1	-31.8	-0.2
Boilers Increased Utilization ^b	29.3	28.0	351.6	173.4	961.2
Projected Change in Actual Emissions	26.7	25.9	318.5	141.6	960.9

- a. The change in actual emissions is calculated as the projected actual emissions minus the baseline actual emissions excluding changes in emissions that would have occurred without the project.
- b. Actual emission change associated with increased utilization of the boilers. The project will increase steam demand by a maximum of 200,000 pounds per hour, equivalent to approximately 260 million Btu/hour of additional heat input to the boilers.

IV APPLICABLE EMISSION STANDARDS

All emission sources in Illinois must comply with Illinois Pollution Control Board emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The affected dryers, which are all equipped with fabric filters, currently comply with applicable Board standards.

Soybean process dryers are not specifically regulated by any federal NSPS. Illinois EPA has also reviewed the Part 61 and 63 NESHAP standards and determined that no standards will be triggered.

The existing coal-fired boilers are subject to state rules and federal NSPS, with which they currently comply. The boilers are also subject to a Part 63 NESHAP standard, 40 CFR 63, Subpart DDDDD, with a future compliance date in September, 2007.

VI. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

This project will not result in a physical change or change in the method of operation of existing boilers (that will see an increased utilization due to increased steam demand) even though these units will undergo a net emissions increase. Therefore, the BACT review requirement of PSD is not triggered for these units in accordance with 40 CFR 52.21 (j) (3). The BACT requirement is only applicable to the emissions units that are undergoing a physical or operational change and have net increase in emissions.

VII. AIR QUALITY ANALYSIS

A Introduction

Ambient air quality considers the emissions from a particular source after they have dispersed following release from a stack, been added to the background level of pollutants in the air entering the region, and joined with the pollutants emitted from other nearby sources.

Air quality analysis is the process of predicting ambient concentrations in an area or as a result of a project and comparing the concentration to the air quality standard or other reference level. Air quality analysis uses a combination of monitoring data and modeling as appropriate.

B. Air Quality Analysis for ADM

An ambient air quality analysis must determine whether the proposed project will cause or contribute to a violation of any applicable air quality standard.

The consequences of installing steam coils on six product dryers for SO₂, PM₁₀, CO and NO_x air quality were previously addressed or accounted for in the processing of the construction permit applications for the "existing" boilers. These boilers were subject to PSD when they were originally permitted and the air quality analyses in the applications showed that the boilers would not endanger ambient air quality. In particular, the boilers were subject to PSD as part of the issuance of Construction Permits 85060030, 94020006 and 97050097. The allowable emissions from the boilers were analyzed for air quality impacts during processing of the applications for these permits. Since there will be no change in the allowable emissions from the boilers with the proposed changes to the product dryers, no new air quality impact analysis was performed for the current permit application..

The newest boiler at the complex is Boiler 9, a 1500 million Btu/hour boiler installed pursuant to Construction Permit 97050097. The air quality analysis in the application for Boiler 9 showed impacts on NO_x, CO and PM₁₀ air quality that are not significant, i.e., impacts that are below the significant impacts levels set by USEPA, as described in Table 1, below. For SO₂, that analysis showed that the SO₂ air quality standards and PSD increments would continue to be met, as described in Tables 2 and 3, below.

Table 1: Summary of Peak Project Impacts (ug/m³)

Pollutant	Averaging Period	Maximum Project Impact	Significant Impact Level (SIL)	Ambient Standard
SO ₂	3-Hour	55.99	25	1,300
	24-Hour	8.24	5	365
	Annual	0.286	1	80
PM ₁₀	24-Hour	4.75	5	150
	Annual	0.426	1	50
CO	1-Hour	29.45	2,000	40,000
	8-Hour	11.59	500	10,000
NO _x	Annual	0.483	1	100

Table 2: Peak PSD Increment Consumption after the Project (ug/m³)

Pollutant	Averaging Period	Maximum Increment Consumed	PSD Increment
SO ₂	3-Hour	176.19	512
	24-Hour	57.24	91
	Annual	10.46	20

Table 3:
Summary of Peak Ambient SO₂ Concentrations after the Project (ug/m³)

Averaging Period	Project and Existing Source Impact	Monitored Background Value	Maximum Future Concentration	Ambient Standard
3-hour	624.00	239.47	863.47	1,300
24-hour	237.00	100.0	337.0	365
Annual	40.94	13.15	54.09	80

These results overstate maximum ambient SO₂ concentrations and increment consumption. This is because the application for Boiler 9 also addressed proposed Boiler 10, a second boiler identical in size to Boiler 9, that ADM ultimately decided not to construct. These results also do not account for reductions in SO₂ emission from certain process units at the complex required by a Consent Decree.

VIII. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the proposed projects meet all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft permit.

Prior to making a final determination, a public comment period will be held to allow the public to provide comments on the Illinois EPA's proposed action and the conditions of the draft permit.