

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 092013-013 Project Number: 2013-05-022  
Installation Number: 217-0043

Parent Company: Archer Daniels Midland Company

Parent Company Address: 4666 Faries Parkway, Decatur, IL 62525

Installation Name: Archer Daniels Midland Processing - Deerfield

Installation Address: 17700 South Highway T, Deerfield, MO 64741

Location Information: Vernon County, S9, T35N, R33W

Application for Authority to Construct was made for:

The installation of a new 28.6 MMBtu/hr natural gas-fired boiler. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

SEP 18 2013

EFFECTIVE DATE

DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

Page No.	3
Permit No.	
Project No.	2013-05-022

### SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

Archer Daniels Midland Processing – Deerfield  
Vernon County, S9, T35N, R33W

1. Superseding Condition  
The conditions of this permit supersede Special Condition 2 in the permit amendment 062008-006A issued by the Air Pollution Control Program.
2. Fuel Restrictions  
ADM-Deerfield shall combust exclusively natural gas in the boiler (EP-21).
3. Volatile Organic Compound (VOC) Emission Limitation
  - A. ADM-Deerfield shall emit less than 237.0 tons of VOC from the entire installation, with the exception of equipment leaks from the biodiesel building, in any consecutive 12-month period. When accounting for emissions from the solvent extraction process and downstream processing, ADM-Deerfield shall equate "actual solvent loss" to VOC emissions and shall calculate "actual solvent loss" in accordance with 40 CFR 63.2853.
  - B. The solvent loss ratio of "actual solvent loss," in accordance with 40 CFR 63.2853, to the "quantity of oilseed processed," in accordance with 40 CFR 63.2855, shall not exceed 0.125 gallons of solvent per ton of oilseed in any rolling 12-month period.
  - C. ADM-Deerfield shall maintain an accurate record of solvent loss ratio and VOC emissions to ensure compliance with Special Conditions 3.A. and 3.B. Such records shall be maintained for not less than five (5) years and shall be made available to any Missouri Department of Natural Resources' personnel upon request.
  - D. ADM-Deerfield shall develop and use forms approved by the Air Pollution Control Program to demonstrate compliance with Special Condition 3.A and 3.B. The forms shall be submitted to the Air Pollution Control Program's Compliance/Enforcement Section within 30 days of the boiler startup.

Page No.	4
Permit No.	
Project No.	2013-05-022

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- E. ADM-Deerfield shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which the records from Special Condition 3.C. and 3.D. indicate that the source exceeds the limitations of Special Conditions 3.A. or 3.B.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2013-05-022  
Installation ID Number: 217-0043  
Permit Number:

Archer Daniels Midland Processing - Deerfield  
17700 South Highway T  
Vernon, MO 64741

Complete: May 6, 2013

Parent Company:  
Archer Daniels Midland Company  
4666 Faries Parkway  
Decatur, IL 6252

Vernon County, S9, T35N, R33W

REVIEW SUMMARY

- Archer Daniels Midland Processing - Deerfield (ADM) has applied for authority to construct a new 28.6 MMBtu/hr natural gas-fired boiler
- HAP emissions are expected from the proposed equipment but only in amounts less than their respective SMAL.
- 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, of the NSPS applies to the boiler.
- 40 CFR Subpart DDDDD, *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*, of the MACT Standard applies to the boiler.
- None of the NESHAPs apply to this installation.
- No air pollution control equipment is being used in association with the new equipment. The boiler does use a low NO<sub>x</sub> burner with flue gas recycle but this is considered an inherent part of the boiler and not a separate air pollution control device.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Vernon County, an attainment area for all criteria pollutants.

- The biodiesel production portion of this installation is in the named source category under category 20, *Chemical Processing Plants*. However, the installation as a whole is not considered a named installation.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment as a condition of this permit
- A modification to your existing Part 70 Operating Permit application is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

The ADM facility consists of a soybean processing plant and a biodiesel manufacturing plant. A turbine to be owned and operated by the Missouri Public Utility Alliance was permitted (No. 092008-004), but never constructed. The soybean processing plant includes material handling operations (e.g. unloading, crushing, conveying, pelletizing, and storage), soybean conditioning (thermal/mechanical), solvent extraction (using hexane), distillation for solvent recovery and refining and bleaching processes (for oil that is to be used for biodiesel production). The maximum production rate of the soybean plant is 730,000 tons per year. Products from the soybean plant include crude oil, refined and bleached oil, meal and hulls.

The biodiesel plant includes chemical reaction vessels, storage tanks, and other process equipment. The primary feedstock for the biodiesel plant is refined and bleached soybean oil from the soybean extraction plant but other oil such as purchased soybean oil, animal fat and waste cooking oil may be used as well. Biodiesel is produced from the base-catalyzed transesterification of soybean oil with methanol. Glycerin is produced as a by-product of the process. The capacity of the biodiesel plant is 41.6 million gallons per year.

The installation is a minor source for construction permits and currently has a Part 70 Operating Permit application undergoing review by the Air Pollution Control Program.

The following New Source Review permits have been issued to ADM-Deerfield from the Air Pollution Control Program.

**Table 1: Permit History**

Permit Number	Description
022007-004	Construction of a soybean processing facility with an integrated biodiesel production plant.
062008-006	Amendment to use a boiler instead of duct burners for heat recovery steam generation (HRSG)
092008-004	Installation of a 141.4 MMBtu/hr turbine (permitted under Missouri Public Utility Alliance).
032012-007	Installation of temporary boiler (expired in June 15, 2012)

## PROJECT DESCRIPTION

In April, 2013, ADM met with the New Source Review Unit of the Air Pollution Control Program to discuss the possibility of eliminating the 237 tons per year of VOC limit set for the soybean extraction and downstream processing in Permit 062008-006. This would cause VOC emissions from the entire installation, which also includes emissions from the biodiesel production facility and the combustion turbine, to be greater than the major source level of 250 tons per year. In order to allow this emissions increase, the facility would need to submit a Prevention of Significant Deterioration (PSD) permit application and perform BACT analysis on certain pollutants which the company estimates to be PM<sub>2.5</sub>, PM<sub>10</sub>, PM, VOC and GHGs. At the same time, the facility would like to add a natural gas-fired boiler rated at 28.6 MMBtu/hr. However, a PSD permit, in general, would require a longer time to issue than a minor source permit and the facility did not want to wait until the PSD permitting process is complete to install the boiler. Therefore, it was decided to treat the entire project as a phased project.

The first phase of the project would be for the installation of the 28.6 MMBtu/hr boiler. The permit for this phase would be issued under section (5). The second phase of the project would be for the increase in VOC emissions and would be issued as a PSD. During the review of the PSD project, the boiler would be included in the analysis. Any BACT analysis and modeling required for the PSD project would also include the boiler. The boiler is equipped with a Low-NO<sub>x</sub> burner with flue gas recycle.

Special Condition No. 2 in amendment 062008-006A limits the entire installation, with the exception of the fugitive leaks from the biodiesel building, to 237 tpy of VOC and superseded the 237 tpy VOC limit in Permit 062008-006. In order to keep this facility from being a major source after this project, the installation must include the VOC emissions from the new boiler in the 237 tpy VOC limit. As a result, Special Condition No. 3 in this permit supersedes the 237 tpy VOC limit in amendment 062008-006A.

## EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, *Natural Gas Combustion*, (7/98).

The following table provides an emissions summary for this project. Existing potential emissions were taken from Permit No. 062008-006. Existing actual emissions were taken from the installation's 2012 EIQ. Potential emissions of the application represent the potential emissions of the boiler, assuming continuous operation (8760 hours per year).

**Table 2: Emissions Summary (tons per year)**

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2012 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM	25.0	N/D	N/D	0.93	N/A
PM <sub>10</sub>	15.0	40.1	15.34	0.93	N/A
PM <sub>2.5</sub>	10.0	N/D	10.70	0.93	N/A
SO <sub>x</sub>	40.0	2.4	0.15	0.18	N/A
NO <sub>x</sub>	40.0	179.6	23.66	17.18	N/A
VOC	40.0	249.5	166.44	0.68	N/A
CO	100.0	89.6	0.0	10.31	N/A
GHG (CO <sub>2</sub> e)	75,000 / 100,000	N/D	N/D	14,755.42	N/A
GHG (mass)	0.0 / 100.0 / 250.0	N/D	N/D	14,725.51	N/A
HAPs	10.0/25.0	159.4	0.0018	0.23	N/A

N/A = Not Applicable; N/D = Not Determined

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

### APPLICABLE REQUIREMENTS

ADM-Deerfield shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

#### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260
  - Does not apply to the boiler if it uses exclusively pipeline grade natural gas as defined in 40 CFR 72.2 or liquefied petroleum gas as defined by the American Society for Testing and Materials (ASTM), or any combination of these fuels.

#### SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070  
*Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Dc
- *MACT Regulations*, 10 CSR 10-6.075  
*National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*, 40 CFR Part 63, Subpart DDDDD

#### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5) Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Chia-Wei Young  
New Source Review Unit

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Date

#### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated May 6, 2013, received May 9, 2013 designating Archer Daniels Midland Company as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

## APPENDIX A

### Abbreviations and Acronyms

<b>%</b> .....	percent	<b>m/s</b> .....	meters per second
<b>°F</b> .....	degrees Fahrenheit	<b>Mgal</b> .....	1,000 gallons
<b>acfm</b> .....	actual cubic feet per minute	<b>MW</b> .....	megawatt
<b>BACT</b> .....	Best Available Control Technology	<b>MHDR</b> .....	maximum hourly design rate
<b>BMPs</b> .....	Best Management Practices	<b>MMBtu</b> ....	Million British thermal units
<b>Btu</b> .....	British thermal unit	<b>MMCF</b> .....	million cubic feet
<b>CAM</b> .....	Compliance Assurance Monitoring	<b>MSDS</b> .....	Material Safety Data Sheet
<b>CAS</b> .....	Chemical Abstracts Service	<b>NAAQS</b> ...	National Ambient Air Quality Standards
<b>CEMS</b> .....	Continuous Emission Monitor System	<b>NESHAPs</b>	
<b>CFR</b> .....	Code of Federal Regulations	.....	National Emissions Standards for Hazardous Air Pollutants
<b>CO</b> .....	carbon monoxide	<b>NO<sub>x</sub></b> .....	nitrogen oxides
<b>CO<sub>2</sub></b> .....	carbon dioxide	<b>NSPS</b> .....	New Source Performance Standards
<b>CO<sub>2e</sub></b> .....	carbon dioxide equivalent	<b>NSR</b> .....	New Source Review
<b>COMS</b> .....	Continuous Opacity Monitoring System	<b>PM</b> .....	particulate matter
<b>CSR</b> .....	Code of State Regulations	<b>PM<sub>2.5</sub></b> .....	particulate matter less than 2.5 microns in aerodynamic diameter
<b>dscf</b> .....	dry standard cubic feet	<b>PM<sub>10</sub></b> .....	particulate matter less than 10 microns in aerodynamic diameter
<b>EQ</b> .....	Emission Inventory Questionnaire	<b>ppm</b> .....	parts per million
<b>EP</b> .....	Emission Point	<b>PSD</b> .....	Prevention of Significant Deterioration
<b>EPA</b> .....	Environmental Protection Agency	<b>PTE</b> .....	potential to emit
<b>EU</b> .....	Emission Unit	<b>RACT</b> .....	Reasonable Available Control Technology
<b>fps</b> .....	feet per second	<b>RAL</b> .....	Risk Assessment Level
<b>ft</b> .....	feet	<b>SCC</b> .....	Source Classification Code
<b>GACT</b> .....	Generally Available Control Technology	<b>scfm</b> .....	standard cubic feet per minute
<b>GHG</b> .....	Greenhouse Gas	<b>SIC</b> .....	Standard Industrial Classification
<b>gpm</b> .....	gallons per minute	<b>SIP</b> .....	State Implementation Plan
<b>gr</b> .....	grains	<b>SMAL</b> .....	Screening Model Action Levels
<b>GWP</b> .....	Global Warming Potential	<b>SO<sub>x</sub></b> .....	sulfur oxides
<b>HAP</b> .....	Hazardous Air Pollutant	<b>SO<sub>2</sub></b> .....	sulfur dioxide
<b>hr</b> .....	hour	<b>tph</b> .....	tons per hour
<b>hp</b> .....	horsepower	<b>tpy</b> .....	tons per year
<b>lb</b> .....	pound	<b>VMT</b> .....	vehicle miles traveled
<b>lbs/hr</b> .....	pounds per hour	<b>VOC</b> .....	Volatile Organic Compound
<b>MACT</b> .....	Maximum Achievable Control Technology		
<b>µg/m<sup>3</sup></b> .....	micrograms per cubic meter		

Mr. Steve Ast  
Health, Safety and Environmental Supervisor  
ADM-Deerfield  
17700 South Highway T  
Deerfield, MO 64741

RE: New Source Review Permit - Project Number: 2013-05-022

Dear Mr. Ast:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Chia-Wei Young, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp  
New Source Review Unit Chief

SH:cyl

Enclosures

c: Southwest Regional Office  
PAMS File: 2013-05-022

Permit Number: