

Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

MAY 27 2019

Mr. Scott Young
Plant Manager
Mid-America Biofuels, LLC
410 S. Jefferson St.
Mexico, MO 65265

RE: New Source Review Permit - Project Number: 2019-04-001

Dear Mr. Young:

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 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 submittal of a Part 70 significant modification application 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.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact the Northeast Regional Office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

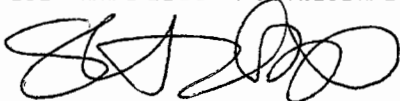
If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to §§621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within 30 days after the date this decision 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 administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.

Mr. Scott Young
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If you have any questions regarding this permit, please do not hesitate to contact Alana Hess, 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



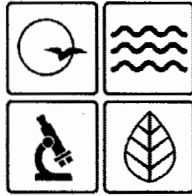
Susan Heckenkamp
New Source Review Unit Chief

SH:ahj

Enclosures

c: Northeast Regional Office
PAMS File: 2019-04-001

Permit Number:



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: **052019-006** Project Number: 2019-04-001
Installation Number: 007-0002

Parent Company: Archer Daniels Midland Company

Parent Company Address: 4666 Faries Parkway, Decatur, IL 62526

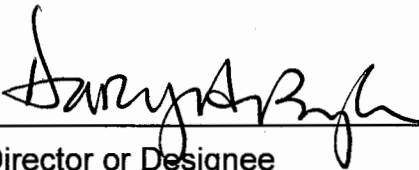
Installation Name: Mid-America Biofuels, LLC

Installation Address: 410 S. Jefferson St., Mexico, MO 65265

Location Information: Audrain County, S29, T51N, R9W

Application for Authority to Construct was made for:
Increased biodiesel production at the Biodiesel Plant. This review was conducted in accordance with Section (5) of 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.



Director or Designee
Department of Natural Resources
MAY 27 2019

Effective Date

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 Enforcement and Compliance Section of 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 Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of startup of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. In addition, you must notify the Department's Northeast Regional Office within 15 days after the actual startup of this (these) air contaminant source(s).

A copy of the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's 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 source(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 using the contact information below.

Contact Information:

Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
<http://dnr.mo.gov/regions/>

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 to 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(3)(E). "Conditions required by permitting authority."

Mid-America Biofuels, LLC
 Audrain County, S29, T51N, R9W

1. **Superseding Condition**
 The conditions of this permit supersede all of the special conditions found in Construction Permit 032013-011 previously issued by the Air Pollution Control Program.

2. **VOC Emission Limitation**
 - A. Mid-America Biofuels, LLC shall emit less than 40.0 tons of VOCs in any consecutive 12-month period from the Biodiesel Plant as detailed in Table 1.

Table 1: Biodiesel Plant VOC Emission Sources

Emission Source	Description
EU0230	Biodiesel Plant Fire Pump Engine
EU0240	Biodiesel Boiler
EU0250	Biodiesel Process Vent
EU0260	Biodiesel Plant Equipment Leaks
EU0270	Biodiesel Loadout
EU0290	(4) Methanol Storage Tanks
EU0300	Large Sodium Methylate Storage Tank
EU0301	(2) Small Sodium Methylate Storage Tanks
EU0320	Biodiesel Filter Purge
EU0340	(3) Biodiesel Bulk Storage Tanks
EU0350	(2) Biodiesel Long Term Storage Tanks
EU0360	(3) Biodiesel Proof Tanks
EU0370	(2) Crude Glycerin Tanks
EU0380	Fatty Acid Tank
EU0390	Diesel Tank for Fire Pump Engine
EU0410	Clear Diesel Storage Tank
EU0420	BioExtend Antioxidant Storage Tank
EU0430	Biodiesel Filter Feed Tank
EU0440	Biodiesel Filter Precoat Tank
EU0450	Biodiesel Filtration Holding Tank
EU0460	Biodiesel Filtration Surge Tank

- B. Attachment A or an equivalent form, such as an electronic form, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 2.A.

SPECIAL CONDITIONS:

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

3. **Fuel Restrictions**
Mid-America Biofuels, LLC shall exclusively combust natural gas in EU0240 Biodiesel Boiler.
4. **Control/Recovery Device Requirements**
 - A. **Water Absorber**
 - 1) Mid-America Biofuels, LLC shall recover VOC emissions from biodiesel methanol stripping and condensation, glycerin methanol stripping and condensation, and methanol rectification and condensation,¹ and the biodiesel reaction and separation process using the Water Absorber.
 - 2) Mid-America Biofuels, LLC shall develop a site-specific operation and maintenance (O&M) procedure for the Water Absorber in a manner consistent with safety and good air pollution control practices for minimizing emissions. The O&M procedure shall indicate:
 - a) The maximum methanol concentration in the recirculating water which shall be set as 110% of the average methanol concentration observed during the most recent measurements used to determine the most recent total resource effectiveness (TRE) index value according to §63.115(d).
 - b) The maximum absorber inlet water temperature which shall be set as 110% of the average absorber inlet water temperature observed during the most recent measurements used to determine the most recent TRE index value according to §63.115(d).
 - c) The minimum recirculating water flow rate which shall be set as 90% of the average recirculating water flow rate observed during the most recent measurements used to determine the most recent TRE index value according to §63.115(d).
 - 3) The Water Absorber shall be operated and maintained in accordance with the site-specific O&M procedure. The Water Absorber shall be equipped with gauges or meters that indicate the absorber inlet water temperature and the recirculating water flow

¹VOC emissions from the biodiesel methanol stripping and condensation, glycerin methanol stripping and condensation, and methanol rectification and condensation process pass through an Oil Absorber and vacuum pump prior to entering the Water Absorber where the VOC (methanol) emissions are recovered. The purpose of the Oil Absorber is to remove moisture from oil feedstock prior to biodiesel reaction and separation; therefore, the Oil Absorber does not recover VOC (methanol) emissions.

SPECIAL CONDITIONS:

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

rate through the recovery device. These gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.

- 4) Mid-America Biofuels, LLC shall determine the methanol concentration in the Water Absorber recirculating water at least once every 24 hours when the process is in operation from a representative sample analyzed by an appropriate analytical method following a standard procedure, including appropriate QA/QC provisions. Mid-America Biofuels, LLC may take additional samples; however, all samples taken during a 24-hour period shall be averaged to determine compliance (i.e. no samples may be excluded from the average).
 - a) Mid-America Biofuels, LLC shall retain records of all methanol concentration analytical results.
 - b) An average methanol concentration in the recirculating water greater than 110% of the average methanol concentration observed during the most recent measurements used to determine the most recent TRE index value according to §63.115(d) is considered a deviation, excluding periods of start-up, shutdown, and malfunction.
- 5) Mid-America Biofuels, LLC shall monitor and record the absorber inlet water temperature at least once every 24 hours when the process is in operation. Mid-America Biofuels, LLC may take additional readings; however, all readings taken during a 24-hour period shall be averaged to determine compliance (i.e. no readings may be excluded from the average). An average absorber inlet water temperature greater than 110% of the average absorber inlet water temperature observed during the most recent measurements used to determine the most recent TRE index value according to §63.115(d) is considered a deviation, excluding periods of start-up, shutdown, and malfunction.
- 6) Mid-America Biofuels, LLC shall monitor and record the recirculating water flow rate through the Water Absorber at least once every 24 hours when the process is in operation. Mid-America Biofuels, LLC may take additional readings; however, all readings taken during a 24-hour period shall be averaged to determine compliance (i.e. no readings may be excluded from the average). An average recirculating water flow rate less than 90% of the average recirculating water flow rate observed during the most recent measurements used to determine the most recent TRE

SPECIAL CONDITIONS:

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

index value according to §63.115(d) is considered a deviation, excluding periods of start-up, shutdown, and malfunction.

- 7) In lieu of the absorber inlet water temperature and recirculating water flow rate monitoring requirements in Special Conditions 4.A.5 and 4.A.6, Mid-America Biofuels, LLC may also use continuous temperature and water flow rate monitoring systems to determine three-hour block average values to demonstrate compliance with the absorber inlet water temperature and recirculating water flow rate limits in Special Conditions 4.A.5 and 4.A.6.
- 8) Mid-America Biofuels, LLC shall maintain onsite a copy of the Water Absorber's site-specific O&M procedure indicating the absorber inlet water temperature and recirculating water flow rate normal operating ranges.
- 9) Mid-America Biofuels, LLC shall maintain an operating and maintenance log for the Water Absorber which shall include the following:
 - a) Incidents of malfunction with impact on emissions (tons), duration of event, probable cause, and corrective actions; and
 - b) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

B. Biodiesel Absorber

- 1) Mid-America Biofuels, LLC shall install a Biodiesel Absorber downstream of the Water Absorber to recover VOC emissions coming from the Water Absorber.
- 2) Mid-America Biofuels, LLC shall develop a site-specific O&M procedure for the Biodiesel Absorber in a manner consistent with safety and good air pollution control practice for minimizing emissions. The O&M procedure shall indicate:
 - a) The maximum average inlet scrubbant temperature which shall be set at 110% of the hourly average inlet scrubbant temperature observed during the most recent measurements used to determine the most recent TRE index according to §63.115(d).
 - b) The minimum average scrubbant flow rate which shall be set as 90% of the average scrubbant flow rate observed during

SPECIAL CONDITIONS:

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

the most recent measurements used to determine the most recent TRE index according to §63.115(d).

- 3) The Biodiesel Absorber shall be operated and maintained in accordance with the site-specific O&M procedure. The Biodiesel Absorber shall be equipped with gauges or meters that indicate the inlet scrubbant temperature and scrubbant flow rate through the recovery device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.
- 4) Mid-America Biofuels, LLC shall monitor and record the inlet scrubbant temperature at least once every 24 hours when the process is in operation. Mid-America Biofuels, LLC may take additional readings; however, all readings taken during a 24-hour period shall be averaged to determine compliance (i.e. no readings may be excluded from the average). An average inlet scrubbant temperature greater than 110% of the average inlet scrubbant temperature observed during the most recent measurements used to determine the most recent TRE index value according to §63.115(d) is considered a deviation, excluding periods of start-up, shutdown, and malfunction.
- 5) Mid-America Biofuels, LLC shall monitor and record the scrubbant flow rate through the Biodiesel Absorber at least once every 24 hours when the process is in operation. Mid-America Biofuels, LLC may take additional readings; however, all readings taken during a 24-hour period shall be averaged to determine compliance (i.e. no readings may be excluded from the average). An average scrubbant flow rate less than 90% of the average scrubbant flow rate observed during the most recent measurements used to determine the most recent TRE index value according to §63.115(d) is considered a deviation, excluding periods of start-up, shutdown, and malfunction.
- 6) In lieu of the inlet scrubbant temperature and the scrubbant flow rate monitoring and recording requirements in Special Conditions 4.B.4 and 4.B.5, Mid-America Biofuels, LLC may use continuous temperature and flow rate monitoring systems to determine three-hour block average values to demonstrate compliance with the inlet scrubbant temperature and scrubbant flow rate limits in Special Conditions 4.B.4 and 4.B.5.

SPECIAL CONDITIONS:

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

- 7) Mid-America Biofuels, LLC shall maintain onsite a copy of the Biodiesel Absorber's site-specific O&M procedure indicating the inlet scrubbant temperature and scrubbant flow rate normal operating ranges.
 - 8) Mid-America Biofuels, LLC shall maintain an operating and maintenance log for the Biodiesel Absorber which shall include the following:
 - a) Incidents of malfunction with impact on emissions (tons), duration of event, probable cause, and corrective actions; and
 - b) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
5. Performance Testing
- A. Mid-America Biofuels, LLC shall conduct a TRE index value determination on EU0250 Biodiesel Process Vent.
 - 1) The vent stream volumetric flow rate (Q_s), the molar composition of the vent stream, the net heating value of the vent stream, and the total organic compounds (TOC) emission rate (minus methane and ethane) (E_{TOC}) shall be measured and calculated according to the procedures in §63.115(d)(2)(i) through (iv) and used as input to the TRE index value calculation in §63.115(d)(3).
 - 2) If the TRE index value of EU0250 Biodiesel Process Vent is determined to be >5.0 but ≤ 8.0 , Mid-America Biofuels, LLC shall amend their operating permit to include the requirements of §63.982(e).
 - B. These tests shall be performed within 60 days after achieving the maximum production rate of the expanded installation, but not later than 180 days after initial start-up for commercial operation of the expanded installation.
 - C. A complete Proposed Test Plan shall be submitted to the Air Pollution Control Program 30 days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The Proposed Test Plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing.

SPECIAL CONDITIONS:

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

- D. One electronic copy of a written report of the performance test results shall be submitted to stacktesting@dnr.mo.gov within 60 days of completion of any required testing. The report shall include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U.S. EPA Method for at least one sample run.
- E. The test report is to account fully for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations.
- 1) During testing required by Special Condition 5.A, Mid-America Biofuels, LLC shall document:
- a) The biodiesel production rate during each performance test run².
 - b) The Water Absorber inlet water temperature during each measurement.
 - c) The recirculating water flow rate through the Water Absorber during each measurement.
 - d) The methanol concentration of the Water Absorber recirculating water during each measurement.
 - e) The Biodiesel Absorber inlet scrubbant temperature during each measurement.
 - f) The scrubbant flow rate through the Biodiesel Absorber during each measurement.
6. EU0280 Biodiesel Cooling Tower Restrictions
- A. The cooling tower shall be equipped with a high efficiency drift eliminator that is designed to reduce drift loss to less than 0.002 percent.
- B. Mid-America Biofuels, LLC shall demonstrate compliance with Special Condition 6.A by maintaining documentation from the manufacturer of the drift eliminator indicating the maximum design drift loss.
- C. The cooling tower and high efficiency drift eliminator shall be operated and maintained in accordance with their manufacturer's specifications. A copy of the manufacturer's specifications shall be retained onsite.

² The biodiesel production rate during each performance test run should be greater than or equal to 6,165 gallons per hour in order for the testing to be considered representative of maximum production.

SPECIAL CONDITIONS:

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

- D. The cooling water circulation rate shall not exceed 6,500 gpm. Any increases to the pumping capacity shall first be approved by the Air Pollution Control Program's Construction Permits Unit.
 - E. Mid-America Biofuels, LLC shall demonstrate compliance with Special Condition 6.D by maintaining documentation from the manufacturer of the maximum cooling water circulation rate of the cooling tower.
 - F. The total dissolved solids (TDS) content in the circulating cooling water shall not exceed 3,500 ppm. TDS samples shall be collected and analyzed according to the following schedule:
 - 1) Quarterly for the first four calendar quarters after start-up of the expanded Biodiesel Plant and
 - 2) Annually thereafter.
 - G. If any of the collected TDS samples exceed 3,500 ppm, Mid-America Biofuels, LLC shall amend this construction permit no later than 90 days after the date the sample was collected to increase the TDS content in project emissions calculations. If the increase in emissions causes the project to exceed the de minimis levels for PM₁₀ or PM_{2.5}, the construction permit amendment shall include ambient air quality modeling demonstrating compliance with the NAAQS for the pollutant(s) exceeding the de minimis levels.
7. Control Requirements – Vapor Balancing
- A. Mid-America Biofuels, LLC shall control emissions from EU0301 (2) Small Sodium Methylate Storage Tanks using the same vapor balancing system used by EU0300 Large Sodium Methylate Storage Tank to comply with NSPS FFFF. Mid-America Biofuels, LLC shall not load or unload the tanks unless the vapor balance system is in operation.
 - B. The vapor balance system shall be operated in accordance with §63.1253(f), except as specified in §63.2470(e)(1)-(3).
 - C. Mid-America Biofuels, LLC shall maintain an operating and maintenance log for the vapor balance system, which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions (tons), duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

SPECIAL CONDITIONS:

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

8. Operational Limitations

- A. Mid-America Biofuels, LLC shall limit biodiesel production to less than or equal to 60,000,000 gallons per consecutive 12-month period.

- B. Mid-America Biofuels, LLC shall demonstrate compliance with Special Condition 8.A by maintaining records of the quantity of biodiesel produced each month and during each consecutive 12-month period using Attachment B – Biodiesel Production Compliance Worksheet or an equivalent form.

9. Record Keeping and Reporting Requirements

- A. Mid-America Biofuels, LLC shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include SDS for all materials used.

- B. Mid-America Biofuels, LLC shall report to the Air Pollution Control Program's Compliance/Enforcement Section, by mail at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

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

Project Number: 2019-04-001

Installation ID Number: 007-0002

Permit Number: **052019-006**

Installation Address:

Mid-America Biofuels, LLC
410 S. Jefferson St.
Mexico, MO 65265

Parent Company:

Archer Daniels Midland Company
4666 Faries Parkway
Decatur, IL 62526

Audrain County, S29, T51N, R9W

REVIEW SUMMARY

- Mid-America Biofuels, LLC has applied for authority to increase production of the Biodiesel Plant to 60,000,000 gallons per year.
- The application was deemed complete on April 1, 2019.
- HAP emissions are expected from the proposed equipment. The primary HAP of concern from the Biodiesel Plant is the methanol used in the base-catalyzed transesterification process. The Biodiesel Plant also emits HAPs from the combustion of natural gas and the storage of methanol, sodium methylate, and hydrochloric acid.
- 40 CFR Part 60, Subpart Dc – *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* applies to EU0240 Biodiesel Boiler. The boiler was constructed in 2006 and is not being modified or reconstructed as part of this project.
- 40 CFR Part 60, Subpart Kb – *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*
 - This regulation applies to EU0290 (4) Methanol Storage Tanks and EU0300 Large Sodium Methylate Storage Tank. Mid-America Biofuels, LLC elects to demonstrate compliance with NSPS Kb for EU0290 and EU0300 by complying with the Group 1 storage tank requirements in MACT FFFF as allowed at §63.2535(c).
 - EU0301 (2) Small Sodium Methylate Storage Tanks are not subject to this regulation as they each have capacities of less than 75 m³.
 - EU0310 (2) Hydrochloric Acid Storage Tanks are not subject to this regulation. HCl does not meet the definition of a volatile organic liquid at §60.111b.

- EU0380 Fatty Acid Tank is not subject to this regulation as it has a capacity greater than 75 m³, but less than 151 m³ and contains a liquid with a maximum true vapor pressure of less than 15.0 kPa.
- EU0340 (3) Biodiesel Bulk Storage Tanks, EU0350 (2) Biodiesel Long Term Storage Tanks, EU0360 (3) Biodiesel Proof Tanks, EU0370 (2) Crude Glycerin Tanks, EU0450 Biodiesel Filtration Holding Tank, EU0460 Biodiesel Filtration Surge Tank, and the RB Soy Oil Tank are not subject to this regulation as they each have capacities greater than 151 m³ and they each contain a liquid with a maximum true vapor pressure of less than 3.5 kPa.
- 40 CFR Part 60, Subpart VV – *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006* currently applies to the Biodiesel Plant. After the modifications to the Biodiesel Plant associated with this project occur the Biodiesel Plant will be subject to NSPS VVa.
- 40 CFR Part 60, Subpart VVa – *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006* will apply to the Biodiesel Plant after the modifications associated with this project occur.
- 40 CFR Part 60, Subpart NNN – *Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations* applies to the two methanol distillation units (biodiesel methanol stripping & condensation and glycerin methanol stripping & condensation) and the methanol recovery system (methanol rectification & condensation). The two methanol distillation units and the methanol recovery system are subject to MACT FFFF and are also subject to NSPS NNN, compliance with MACT FFFF constitutes compliance with NSPS NNN per §63.2535(h).
- 40 CFR Part 60, Subpart RRR – *Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes* applies to the two biodiesel reactors, which operate in a nitrogen blanket and the recovery system (Water Absorber). The installation elects to demonstrate compliance with NSPS RRR by complying with MACT FFFF as allowed at §63.2535(h).
- 40 CFR Part 63, Subpart Q – *National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers* is not applicable. EU0280 Biodiesel Cooling Tower will not be operated with chromium-based water treatment chemicals.
- 40 CFR Part 63, Subpart SS – *National Emission Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process* applies to EU0250 Biodiesel Process Vent per MACT FFFF.

- 40 CFR Part 63, Subpart UU – *National Emission Standards for Equipment Leaks – Control Level 2 Standards*. For EU0260 Biodiesel Plant Equipment Leaks, the installation elects to comply with MACT FFFF by complying with MACT UU.
- 40 CFR Part 63, Subpart EEEE – *National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-gasoline)* does not apply. The biodiesel distributed by the Biodiesel Plant do not meet the definition of organic liquid in MACT EEEE as it does not contain 5 wt% or greater of an organic HAP listed in Table 1 of MACT EEEE.
- 40 CFR Part 63, Subpart FFFF – *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing*
 - Because the Water Absorber and Biodiesel Absorber are recovery devices, if the TRE index value of EU0250 Biodiesel Process Vent is determined to be >5.0 but ≤8.0, the installation is required to comply with the requirements of §63.982(e), except as specified in §63.2450. [§63.2455(c)]
 - The potential emissions of EU0320 Biodiesel Filter Purge are less than 3,000 pounds per year; therefore, this emission source is a Group 2 batch process vents as defined at §63.2550.
 - EU0290 Methanol Storage Tanks and EU0300 Large Sodium Methylate Storage Tank comply with the vapor balancing alternative at §63.2470(e).
 - EU0301 (2) Small Sodium Methylate Storage Tanks, EU0340 (3) Biodiesel Bulk Storage Tanks, EU0350 (2) Biodiesel Long Term Storage Tanks, EU0370 (2) Crude Glycerin Tanks, EU0380 Fatty Acid Tank, and EU0420 BioExtend Antioxidant Storage Tank are Group 2 storage tanks as defined at §63.2550.
 - EU0310 (2) Hydrochloric Acid Storage Tanks comply with NSPS FFFF by venting to an acid gas scrubber.
 - EU0270 Biodiesel Loadout is a Group 2 transfer rack as defined at §63.2550.
 - EU0260 Biodiesel Plant Equipment Leaks comply with MACT UU as required by Table 6 of MACT FFFF.
 - EU0360 Biodiesel Proof Tanks, EU0430 Biodiesel Filter Feed Tank, EU0440 Biodiesel Filter Precoat Tank, EU0450 Biodiesel Filtration Holding Tank, and EU0460 Biodiesel Filtration Surge Tank are process tanks as defined at §63.2550.
- 40 CFR Part 63, Subpart DDDDD – *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters* applies to EU0240 Biodiesel Boiler.
- A Water Absorber and a Biodiesel Absorber in series recover VOC and methanol emissions from the Biodiesel Plant. Special Condition 4 contains practically enforceable requirements to ensure the proper operation of the Water Absorber and Biodiesel Absorber. VOC and methanol emissions from equipment leaks are controlled by LDAR as required by MACT FFFF. VOC and methanol emissions from EU0290 Methanol Storage Tanks and EU0300 Large Sodium Methylate Storage Tank are controlled by vapor balancing as required by MACT FFFF. An acid gas scrubber controls HCl emissions from EU0310 (2) Hydrochloric Acid Storage Tanks as required by MACT FFFF. A drift eliminator controls particulate emissions from

EU0280 Biodiesel Cooling Tower as required by Special Condition 6. VOC and methanol emissions from EU0301 (2) Small Sodium Methylate Storage Tanks are controlled by vapor balancing as required by Special Condition 7.

- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060 *Construction Permits Required*. Potential emissions of VOC are conditioned below de minimis levels.
- This installation is located in Audrain County, an attainment/unclassifiable area for all criteria pollutants.
- The Biodiesel Plant is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2 Item #20 Chemical Process Plants. The Biodiesel Plant's major source level is 100 tons per year and fugitive emissions are counted towards major source applicability. The Extraction Plant is not a named source; therefore, the major source level for the entire installation (Biodiesel Plant and Extraction Plant) is 250 tons per year and only the fugitive emissions from the Biodiesel Plant are counted towards major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below the SMALs and are conditioned below de minimis levels.
- Emissions testing is required for EU0250 Biodiesel Process Vent as a part of this permit. TDS monitoring of EU0280 Biodiesel Cooling Tower's circulating cooling water is also required as part of this permit. Testing may be required as part of other state, federal or applicable rules.
- A Part 70 Operating Permit significant modification application is required for this installation within one year of commencement of operations.
- Approval of this permit is recommended with special conditions.

EXISTING INSTALLATION DESCRIPTION

Archer Daniels Midland Company operates a soybean oil extraction plant (Extraction Plant) and a biodiesel manufacturing plant (Biodiesel Plant) in Mexico, MO. The Extraction Plant and Biodiesel Plant are considered one installation. The installation is an existing major NSR, Title V, and HAP source.

The Extraction Plant includes soybean 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). Products from the Extraction Plant include crude soybean oil, refined soybean oil, bleached soybean oil, meal, hulls, and pellets. The Extraction Plant is currently permitted to crush 2,100 tons of soybeans per day.

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 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 Biodiesel Plant is currently permitted to produce a maximum of 50,000,000 gallons of biodiesel per year.

The Air Pollution Control Program has issued the following permits to Archer Daniels Midland Company's Mexico installation:

Table 2: Permit History

Permit Number	Description
0284-007	PSD for construction of a boiler at Extraction Plant
0795-002	Minor NSR for construction of a new soybean dehulling system at Extraction Plant
032006-010	Minor NSR for construction of a 36,000,000 gallons per year Biodiesel Plant
102006-015	Minor NSR for modification/installation of the Biodiesel Plant
102010-003	PSD for an increase in crushing capacity to 2,100 tons per day at the Extraction Plant
032006-010A	Amendment to Permit 032006-010
072009-005	Minor NSR for the construction of a sodium methylate production process at the Biodiesel Plant
102006-015A	Amendment to Permit 102006-015. Supersedes conditions contained in Permit Amendment 032006-010A
032013-011	Minor NSR for expansion of Biodiesel Plant to 50,000,000 gallons per year
082014-011	Minor NSR for modification of the West Dump at the Extraction Plant
OP2018-108	Part 70 Operating Permit

PROJECT DESCRIPTION

Archer Daniels Midland Company has applied for authority to increase biodiesel production at the Biodiesel Plant from the currently permitted rate of 50,000,000 gallons per year to 60,000,000 gallons per year.

Biodiesel Plant Description & Modifications

Bleaching clay/diatomaceous earth, methanol, sodium methylate, hydrochloric acid, animal fat, waste cooling oil, and sodium hydroxide are received by truck or railcar. Soybean oil is received from the Extraction Plant and from other sources by truck or railcar. Liquid materials are stored in tanks prior to use.

Methanol, soybean oil/animal fat/waste cooking oil, and sodium methylate are combined in the biodiesel reactors. After transesterification of the oil to biodiesel and glycerin, the mixture is separated and methanol is recovered for reuse. Emissions from the biodiesel reactors are under nitrogen blanket and vent to a Water Absorber and Biodiesel Absorber in series. Emissions from the separation and recovery process pass through an Oil Absorber, which vents to the Water Absorber. The primary purpose of the Oil Absorber is to remove moisture from the oil feedstock. Biodiesel and glycerin are stored in tanks onsite prior to being loaded out via truck or railcar.

Modifications to increase the capacity to 60,000,000 gallons per year include:

- Increasing the diameter of some process and filtration piping.
- Replacing approximately 50% of the pumps with higher capacity units.
- Installation of approximately 220 new flanges/thread connectors and approximately 40 new valves associated with the new Alcoholic Neutralization.
- Converting one of the 23,000 gallon tanks that currently hold sodium methylate to a methanol storage tank.
- Converting two currently idle 4,512 gallon tanks to sodium methylate storage tanks.
- Converting one currently idle 27,540 gallon tank to a sodium methylate storage tank
- Increasing cooling tower capacity.

Biodiesel Plant Emission Source List

Table 3 contains a complete list of emission sources at the Biodiesel Plant. A list of Extraction Plant emission sources is available in the installation's operating permit.

Table 3: Biodiesel Plant Emission Source List

Emission Source	Description	Control/Recovery Equipment
EU0230	Biodiesel Fire Pump Engine, 235 HP Diesel	None
EU0240	Biodiesel Boiler, 16.33 MMBtu/hr Natural Gas	Low NO _x Burners and Flue Gas Recirculation
EU0250	Biodiesel Process Vent	CD-16 Water Absorber and Biodiesel Absorber in series
EU0260	Biodiesel Plant Equipment Leaks	LDAR
EU0270	Biodiesel Loadout	None
EU0280	Biodiesel Cooling Tower	Drift Eliminator
EU0290	(3) 38,000 gallon Methanol Tanks	Vapor Balancing
	23,000 gallon Methanol Tank	Vapor Balancing
EU0300	27,540 gallon Sodium Methylate Tank	Vapor Balancing
EU0301	(2) 4,512 gallon Sodium Methylate Tanks	Vapor Balancing
EU0310	(2) 5,600 gallon Hydrochloric Acid Tanks	Acid Gas Scrubber
EU0320	Biodiesel Filter Purge	None
EU0340	(3) 432,227 gallon Biodiesel Bulk Tanks	None
EU0350	(2) 1,093,963 gallon Biodiesel Long Term Tanks	None
EU0360	(3) 98,457 gallon Biodiesel Proof Tanks	None
EU0370	(2) 82,464 gallon Crude Glycerin Tanks	None
EU0380	20,616 gallon Fatty Acid Tank	None
EU0400	Biodiesel Paved Haul Road	None
N/A	100,000 gallon RB Soy Oil Tank	None
EU0390	300 gallon Diesel Tank	None
EU0410	1,000 gallon Clear Diesel Storage Tank	None

Emission Source	Description	Control/Recovery Equipment
EU0420	2,200 gallon BioExtend Antioxidant Storage Tank	None
EU0430	785 gallon Biodiesel Filter Feed Tank	None
EU0440	3,721 gallon Biodiesel Filter Precoat Tank	None
EU0450	41,253 gallon Biodiesel Filtration Holding Tank	None
EU0460	98,457 gallon Biodiesel Filtration Surge Tank	None

PSD Applicability

The Biodiesel Plant is a named source nested within the larger installation; therefore, the major source threshold for the Biodiesel Plant is 100 tons per year and fugitives emissions are counted towards major source applicability. Potential emissions from the Biodiesel Plant prior to (50,000,000 gallons per year) and after the expansion (60,000,000 gallons per year) are indicated in Table 4.

Table 4: Biodiesel Plant PTE

Biodiesel Production Rate (gallons per year)	50,000,000	60,000,000
Pollutant	PTE (tons per year)	PTE (tons per year)
PM	1.47	1.88
PM ₁₀	1.07	1.23
PM _{2.5}	0.69	0.70
SO _x	0.17	0.17
NO _x	5.42	5.42
VOC	<40	<40
CO	6.33	6.34
Combined HAP	22.20	23.75
Methanol (67-56-1)	22.00	23.54

Potential VOC emissions from the Biodiesel Plant were previously limited to 40 tpy in Construction Permit 102006-015 to avoid the initial installation of the 36,000,000 gallons per year Biodiesel Plant being a major modification. The Biodiesel Plant 40 tpy VOC limit was superseded and re-instated in Construction Permit 032013-011 to avoid the expansion of the Biodiesel Plant to 50,000,000 gallons per year being a major modification. The 40 tpy VOC limit on the Biodiesel Plant cannot be removed without triggering §52.21(r)(4); therefore, the 40 tpy VOC limit is being superseded and re-instated in this permit to ensure that the expanded 60,000,000 gallons per year Biodiesel Plant does not trigger PSD.

BIODIESEL PLANT EMISSIONS/CONTROLS EVALUATION

EU0230 Biodiesel Fire Pump Engine

Emission factors were obtained from WebFIRE for Process SCC 20200102. The engine is rated at 235 HP and combusts a maximum of 12.654 gallons of diesel per hour. The

engine is unaffected by this project (i.e. no increase in potential emissions). Potential emissions were based on 500 hours of operation per EPA's guidance document "Calculating PTE for Emergency Generators" (September 1995).

EU0240 Biodiesel Boiler

Emission factors were obtained from AP-42 Section 1.4 "Natural Gas Combustion" (July 1998). The boiler is rated at 16.33 MMBtu/hr natural gas and is equipped with flue gas recirculation. The boiler is unaffected by this project (i.e. no increase in potential emissions).

EU0250 Biodiesel Process Vent

A Water Absorber is used to recover methanol emissions from the biodiesel process vent. After the Water Absorber, a Biodiesel Absorber is used to recover hexane emissions from the biodiesel process vent. The source of the circulating water in the Water Absorber is water separated in the methanol rectification column. Based on the August 15, 2018 TRE index values, the applicant proposed an emission rate of 0.04939 pounds methanol per hour. Special Condition 5.A requires repeat measurements to verify the post-project TRE index value, the appropriate NSPS FFFF requirements, and to obtain an accurate emission factor for Attachment A. Potential emissions were based on 60,000,000 gallons per year of biodiesel production.

EU0260 Biodiesel Plant Equipment Leaks

Potential emissions were calculated based on the number of components, methanol concentration in the fluid handled by the component, and emission factors obtained from EPA's "Protocol for Equipment Leak Emission Estimates" (November 1995) Table 2-1. As leak detection and repair (LDAR) monitoring is required by NSPS VVa, control efficiencies of 61% for valves in light liquid service and 45% for pumps in light liquid service were included in emissions calculations (obtained from "Protocol for Equipment Leak Emission Estimates" Table 5-2). See Table 5 for a detailed list of equipment leak components.

Table 5: Biodiesel Plant Equipment Leaks

System	Methanol Concentration wt%	# of Flanges/ Thread Connectors	# of Valves	# of Pumps/ Agitators
Sodium Methylate Storage	100%	405	45	0
Methanol Storage Tanks	100%	229	56	1
Biodiesel Reaction	22%	312	115	5
Biodiesel Wash	45%	49	11	1
Glycerin Stripper	35%	101	42	1
DG Evaporator	30%	171	46	0
Alcoholic Neutralization	22%	0	0	0
Water-Methanol Distillation	66%	129	42	0
Vent Recovery & Rework	30%	45	6	0
Nitrogen Blanket On All Vessels	30%	103	31	0

EU0270 Biodiesel Loadout

Potential emissions from biodiesel truck and rail loadout were estimated using AP-42 Section 5.2 "Transportation and Marketing of Petroleum Liquids" (July 2008), based on submerged loading of 60,000,000 gallons biodiesel per year to tank trucks and railcars that previously held fuel oil #2 or gasoline.

EU0280 Biodiesel Cooling Tower

PM emissions from the cooling tower were determined using the calculation methodology in AP-42 Section 13.4 "Wet Cooling Towers" (January 1995), a maximum cooling water circulation rate of 6,500 gpm, the maximum TDS content proposed by the applicant of 3,500 ppm, and a maximum drift loss of 0.002%. Special Condition 6 requires verification of the TDS content. PM₁₀ and PM_{2.5} emissions were determined using the calculation methodology in Reisman and Frisbie's "Calculating Realistic PM₁₀ emissions from Cooling Towers" (July 2002).

EU0290 Methanol Storage Tanks

Uncontrolled methanol emissions were estimated using TANKS4.0.9d. ADM complies with NSPS FFFF by using vapor balancing on these tanks; therefore, 95% control efficiency was applied to the uncontrolled methanol emission rate. Potential emissions were based on a maximum methanol throughput of 7,560,000 gallons per year.

EU0300 Large Sodium Methylate Storage Tank

Uncontrolled methanol emissions were estimated using TANKS4.0.9d. The SDS for sodium methylate indicates the material contains 70% methanol and 30% sodium methanolate. It was conservatively assumed that the tank contains 100% methanol. ADM complies with NSPS FFFF by using vapor balancing on this tank; therefore, 95% control efficiency was applied to the uncontrolled methanol emission rate. Potential emissions were based on a maximum sodium methylate throughput of 1,631,434 gallons per year.

EU0301 Small Sodium Methylate Storage Tanks

Uncontrolled methanol emissions were estimated using TANKS4.0.9d. The SDS for sodium methylate indicates the material contains 70% methanol and 30% sodium methanolate. It was conservatively assumed that the tanks contain 100% methanol. These tanks share a common header for vapor balancing with EU0300; however, the operation of the vapor balancing for these tanks is not required under NSPS FFFF. In order to make the vapor balancing system practically enforceable a special condition has been included in this permit. Potential emissions were based on a maximum sodium methylate throughput of 1,631,434 gallons per year.

EU0310 Hydrochloric Acid Storage Tanks

Uncontrolled HCl emissions were estimated using the ideal gas law. Uncontrolled emissions were reduced by 99.5% to account for the operation of the acid gas scrubber required by NSPS FFFF. Potential emissions were based on a maximum hydrochloric acid throughput of 497,607 gallons per year.

EU0320 Biodiesel Filter Purge

Emissions from the filtration of the biodiesel occur at the end of the filtration cycle when the filter is purged. The filter requires purging every 20 hours with emissions from each purging event determined to be 2.0436 pounds VOC/HAP, 1.7223 pounds methanol, and 0.3213 pounds hexane using Emission Master 8.3.3.17®.

EU0340 Biodiesel Bulk Storage Tanks, EU0350 Biodiesel Long Term Storage Tanks, EU0360 Biodiesel Proof Tanks, EU0430 Biodiesel Filter Feed Tank, EU0450 Biodiesel Filtration Holding Tank, and EU0460 Biodiesel Filtration Surge Tank

Emissions were estimated using TANKS4.0.9d. The SDS submitted for the biodiesel indicates the material contains up to 1 wt% methanol. As biodiesel is not in the TANKS4.0.9d database, biodiesel emissions were estimated using distillate fuel oil #2. Potential emissions were based on a maximum biodiesel throughput of 60,000,000 gallons per year.

EU0370 Crude Glycerin Tanks

Emissions were estimated using TANKS4.0.9d. The SDS submitted for the crude glycerin indicates the material contains up to 0.075 wt% methanol. Potential emissions were based on a maximum glycerin throughput of 4,200,000 gallons per year.

EU0380 Fatty Acid Tank

Emissions were estimated using TANKS4.0.9d. The SDS submitted for the fatty acid indicates the material contains up to 0.1 wt% methanol. Potential emissions were based on a maximum fatty acid throughput of 510,000 gallons per year.

EU0400 Biodiesel Paved Haul Road

Emissions from the 0.095 mile paved haul road were calculated using Equation 2 from AP-42 Section 13.2.1 "Paved Haul Roads" (January 2011), a silt loading of 1.1 g/m², a mean vehicle weight of 26.26 tons, and 105 days per year with at least 0.01" of precipitation. ADM Mexico has capabilities to ship and receive by truck or rail. In order to be conservative in calculating project emissions, each raw material and product was assumed received/shipped by truck.

EU0390 Diesel Tank

Emissions were estimated using emission factors obtained from WebFIRE for Process SCCs 40301021 and 40301019. Potential emissions were based on the maximum annual diesel throughput of EU0230 Biodiesel Fire Pump Engine.

EU0410 Clear Diesel Storage Tank

Emissions were estimated using emission factors obtained from WebFIRE for Process SCCs 40301021 and 40301019. Potential emissions were based on the maximum annual diesel throughput of 6,000,000 gallons.

EU0420 BioExtend Antioxidant Storage Tank

Emissions were estimated using TANKS4.0.9d. The SDS submitted for the BioExtend Antioxidant indicates the material contains up to 80 wt% diethylene glycol monobutyl ether (a glycol ether). Potential emissions were based on a maximum throughput of 4,400 gallons per year.

EU0440 Biodiesel Filter Precoat Tank

Emissions were estimated using TANKS4.0.9d. The SDS submitted for the biodiesel indicates the material contains up to 1 wt% methanol. As biodiesel is not in the TANKS4.0.9d database, biodiesel emissions were estimated using distillate fuel oil #2. Potential emissions were based on a maximum biodiesel throughput of 1,041,880 gallons per year.

Table 6 provides an emissions summary for this project. Existing installation potential emissions includes both the Extraction Plant and the Biodiesel Plant. Existing actual emissions were taken from the installation's 2017 EIQ. Potential emissions of the application represent the increase in potential emissions of the expanded Biodiesel Plant, assuming continuous operation (8,760 hours per year).

Table 6: Emissions Summary (tpy)

Pollutant	Regulatory De Minimis Levels	Existing Installation Potential Emissions	Existing Actual Emissions (2017 EIQ)	Project Potential Emissions Increase
PM	25.0	N/D	N/A	0.41
PM ₁₀	15.0	N/D	17.19	0.15
PM _{2.5}	10.0	N/D	4.62	0.01
SO _x	40.0	Major	0.16	N/A
NO _x	40.0	N/D	27.14	N/A
VOC	40.0	Major	187.26	0
CO	100.0	N/D	22.80	0.01
Combined HAP	25.0	Major	118.02	1.56
Methanol (67-56-1)	10.0 ³	Major	11.45	1.54
Hexane (110-54-3)	10.0 ³	Major	106.57	0.01

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 VOC are conditioned below de minimis levels.

APPLICABLE REQUIREMENTS

ADM - Mexico shall comply with the following requirements applicable to the Biodiesel Plant. 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

³ This value also represents the SMAL.

verified at the time this application was approved. For a complete list of requirements applicable to ADM – Mexico, please consult their current operating permit OP2018-108:

- 10 CSR 10-6.050 *Start-Up, Shutdown, and Malfunction Conditions*
- 10 CSR 10-6.065 *Operating Permits*
 - A significant modification of Part 70 Operating Permit OP2018-108 is required no later than one year after the commencement of the expanded operations.
- 10 CSR 10-6.070 *New Source Performance Regulations*
 - 40 CFR Part 60, Subpart Dc – *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*
 - 40 CFR Part 60, Subpart Kb – *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*
 - 40 CFR Part 60, Subpart VVa – *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006*
 - 40 CFR Part 60, Subpart NNN – *Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations*
 - 40 CFR Part 60, Subpart RRR – *Standards of Performance for Volatile Organic Compounds Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes*
- 10 CSR 10-6.075 *Maximum Achievable Control Technology Regulations*
 - 40 CFR Part 63, Subpart SS – *National Emission Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process*
 - 40 CFR Part 63, Subpart UU – *National Emission Standards for Equipment Leaks – Control Level 2 Standards*
 - 40 CFR Part 63, Subpart FFFF – *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing*
 - 40 CFR Part 63, Subpart ZZZZ – *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*
 - 40 CFR Part 63, Subpart DDDDD – *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*
- 10 CSR 10-6.110 *Submission of Emission Data, Emission Fees and Process Information*
 - A full EIQ is required each year for Part 70 sources.
- 10 CSR 10-6.165 *Restriction of Emission of Odors*
- 10 CSR 10-6.170 *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*
- 10 CSR 10-6.220 *Restriction of Emission of Visible Air Contaminants*

STAFF RECOMMENDATION

Based on this review conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060 *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated March 27, 2019, received April 1, 2019, designating Archer Daniels Midland Company as the owner and operator of the installation.

Attachment A - VOC Compliance Worksheet

Mid-America Biofuels, LLC
 Audrain County, S29, T51N, R9W
 Project Number: 2019-04-001
 Installation ID Number: 007-0002
 Permit Number: **052019-006**

This sheet covers the period from _____ to _____
 (month, year) (month, year)

Emission Source	Description	Monthly Usage	VOC Emission Factor	Monthly VOC Emissions ⁴ (tons)
EU0230	Biodiesel Plant Fire Pump Engine	hours ⁵	0.62 lb/hr ⁶	
EU0240	Biodiesel Boiler	16.33 MMBtu/hr	5.5 lb/MMscf ⁷	0.032
EU0250	Biodiesel Process Vent – Controlled by Water Absorber	Mgal Biodiesel	0.0076 lb/Mgal ⁸	
	Biodiesel Process Vent – SSM emissions	Mgal Biodiesel	0.076 lb/Mgal ⁹	
EU0260	Biodiesel Equipment Leaks	See Table 5		1.743
EU0270	Biodiesel Truck/Rail Loadout submerged loading dedicated biodiesel/fuel oil #2 service	Mgal Biodiesel	0.014 lb/Mgal ¹⁰	
	Biodiesel Truck Loadout submerged loading dedicated gasoline service	Mgal Biodiesel	5 lb/Mgal ¹⁰	
EU0290	Methanol Storage Tanks Working Losses – Controlled by Vapor Balancing	Mgal Methanol	0.037 lb/Mgal ¹¹	
	Methanol Storage Tanks Working Losses – SSM emissions	Mgal Methanol	0.74 lb/Mgal ¹²	

⁴ Monthly VOC Emissions (tons) = Monthly Usage x VOC Emission Factor x 0.0005 ton/lb.

⁵ Obtained from the nonresettable meter on the engine as this month's hours minus previous month's hours.

⁶ A VOC emission factor of 49.3 lb/Mgal was obtained from WebFIRE for Process SCC 20200102. The engine has an MHDR of 12.654 gallons per hour.

⁷ Obtained from AP-42 Section 1.4 "Natural Gas Combustion" (July 1998).

⁸ Obtained from ADM Deerfield's February 2009 stack test. To be replaced by the results of the TRE measurements in Special Condition 5. VOC Emission Factor = measured E_{TOC} emissions rate (lb/hr) / average biodiesel production rate (Mgal/hr) during the measurement(s).

⁹ Assumes a 90% control efficiency for the Water Absorber.

¹⁰ Obtained from AP-42 Section 5.2 "Transportation and Marketing of Petroleum Liquids" (July 2008).

¹¹ Assumes a 95% control efficiency for Vapor Balancing.

¹² Obtained from TANKS4.0.9d.

Emission Source	Description	Monthly Usage	VOC Emission Factor	Monthly VOC Emissions ⁴ (tons)
EU0300 & EU0301	Sodium Methylate Storage Tanks Working Losses – Controlled by Vapor Balancing	Mgal Sodium Methylate	0.064 lb/Mgal ¹¹	
	Sodium Methylate Storage Tanks Working Losses – SSM emissions	Mgal Sodium Methylate	1.29 lb/Mgal ¹²	
EU0320	Biodiesel Filter Purge	438 purges/yr	2.04 lb/purge ¹³	0.037
EU0340	Biodiesel Bulk Storage Tanks Working Losses	60 MMgal/yr Biodiesel	0.028 lb/Mgal ¹²	0.070
EU0350	Biodiesel Long Term Storage Tanks Working Losses	60 MMgal/yr Biodiesel	0.027 lb/Mgal ¹²	0.067
EU0360	Biodiesel Proof Tanks Working Losses	60 MMgal/yr Biodiesel	0.0084 lb/Mgal ¹²	0.021
EU0370	Crude Glycerin Tank Working Losses	4.2 MMgal/yr crude glycerin	7.2 x 10 ⁻⁴ lb/Mgal ¹²	1.26 x 10 ⁻⁴
EU0380	Fatty Acid Tank Working Losses	510 Mgal/yr fatty acid	9.88 x 10 ⁻⁴ lb/Mgal ¹²	2.10 x 10 ⁻⁴
EU0390	Fire Pump Engine Diesel Tank Working Losses	12.654 gph diesel	0.02 lb/Mgal ¹⁴	9.24 x 10 ⁻⁴
EU0410	Clear Diesel Storage Tank Working Losses	600 Mgal/yr clear diesel	0.02 lb/Mgal ¹⁴ <small>Error! Bookmark not defined.</small>	5.00 x 10 ⁻⁴
EU0420	BioExtend Antioxidant Storage Tank Working Losses	4.4 Mgal/yr antioxidant	0.14 lb/Mgal ¹²	2.50 x 10 ⁻⁵
EU0430	Biodiesel Filter Feed Tank Working Losses	60 MMgal/yr Biodiesel	0.028 lb/Mgal ¹²	0.070
EU0440	Biodiesel Filter Precoat Tank Working Losses	1.041 MMgal/yr filter precoat	0.028 lb/Mgal ¹²	1.21 x 10 ⁻³
EU0450	Biodiesel Filtration Holding Tank Working Losses	60 MMgal/yr Biodiesel	0.028 lb/Mgal ¹²	0.070
EU0460	Biodiesel Filtration Surge Tank Working Losses	60 MMgal/yr Biodiesel	0.028 lb/Mgal ¹²	0.070
EU0340, EU0350, EU0360, EU0370, EU0380, EU0390, EU0410, EU0420, EU0430, EU0440, EU0450, and EU0460 Tank Breathing Losses ¹⁵				0.037
Installation Monthly VOC Emissions¹⁶ (tons):				
Installation 12-Month Rolling Total VOC Emissions¹⁷ (tons):				

¹³ Obtained from Emission Master® 8.3.3.17.

¹⁴ Obtained from WebFIRE for Process SCC 40301021.

¹⁵ Obtained from TANKS4.0.9d or from WebFIRE for Process SCC 40301019.

¹⁶ Installation Monthly VOC Emissions (tons) = the sum of each emission source's Monthly VOC Emissions (tons).

¹⁷ Installation 12-Month Rolling Total VOC Emissions (tons) = the sum of the 12 most recent Installation Monthly VOC Emissions (tons).

APPENDIX A

Abbreviations and Acronyms

%	percent	Mgal	1,000 gallons
°F	degrees Fahrenheit	MW	megawatt
acfm	actual cubic feet per minute	MHDR	maximum hourly design rate
BACT	Best Available Control Technology	MMBtu	Million British thermal units
BMPs	Best Management Practices	MMCF	million cubic feet
Btu	British thermal unit	MSDS	Material Safety Data Sheet
CAM	Compliance Assurance Monitoring	NAAQS ...	National Ambient Air Quality Standards
CAS	Chemical Abstracts Service	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CEMS	Continuous Emission Monitor System	NO_x	nitrogen oxides
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	carbon monoxide	NSR	New Source Review
CO₂	carbon dioxide	PM	particulate matter
CO_{2e}	carbon dioxide equivalent	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
COMS	Continuous Opacity Monitoring System	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
CSR	Code of State Regulations	ppm	parts per million
dscf	dry standard cubic feet	PSD	Prevention of Significant Deterioration
EIQ	Emission Inventory Questionnaire	PTE	potential to emit
EP	Emission Point	RACT	Reasonable Available Control Technology
EPA	Environmental Protection Agency	RAL	Risk Assessment Level
EU	Emission Unit	SCC	Source Classification Code
fps	feet per second	scfm	standard cubic feet per minute
ft	feet	SDS	Safety Data Sheet
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	SSM	Startup, Shutdown & Malfunction
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		
m/s	meters per second		