

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: **092017-009**

Project Number: 2017-05-037
Installation Number: 195-0046

Parent Company: Mid-Missouri Energy, Inc.

Parent Company Address: 15311 N. Saline 65 Hwy, Malta Bend, MO 65339

Installation Name: Mid-Missouri Energy, Inc.

Installation Address: 15311 N. Saline 65 Hwy, Malta Bend, MO 65339

Location Information: Saline County, S24, T512N, R23W

Application for Authority to Construct was made for:

The increase of annual denatured ethanol production from 60 million gallons to 66 million gallons. 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.


Prepared by
Chia-Wei Young
New Source Review Unit


Director or Designee
Department of Natural Resources

SEP 25 2017

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 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 Departments' 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.

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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."

Mid-Missouri Energy, LLC
Saline County, S24, T51N, R23W

1. **Superseding Condition**
The conditions of this permit supersede all special conditions found in the previously issued construction permit (No. 092011-001) issued by the Air Pollution Control Program.
2. **Processing Limits**
 - A. Mid-Missouri Energy, LLC shall not exceed the following annual limit per 12-month rolling period.

Table 1: Annual Truck Limits

Item (truck capacity)	Annual Limit
Grain, DDGS (Dry Distiller's Grain With Solubles), Wetcake, Enzymes, Urea Acid, and Caustic Delivery/Shipment (25 tons per truck capacity)	34,980 trucks
Ethanol Shipment and Denaturant Delivery (7,800 gallons per truck capacity)	8,674 trucks
CO ₂ shipment (20 tons per truck capacity)	5,475 trucks

- B. Mid-Missouri Energy, LLC shall not exceed an annual production limit of 66,000,000 gallons of denatured ethanol per 12-month rolling period.
 - C. Mid-Missouri Energy, LLC shall demonstrate compliance with Special Conditions 2.A. and 2.B. by developing its own forms. The forms shall include, at a minimum, monthly gallons of denatured ethanol produced, the monthly material hauled by the trucks, the monthly total number of trucks hauling each specific material, the 12-month rolling total number of trucks, the 12-month rolling total of denatured ethanol produced, the compliance limits, and indication of compliance with the limits.

SPECIAL CONDITIONS:

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

3. Acrolein Emission Limits

- A. Mid-Missouri Energy, LLC shall not discharge acrolein emissions into the atmosphere from the entire installation, or individual stack, in excess of the listed amounts in any consecutive twelve month period. This shall include emissions from startup, shutdown, and malfunction as reported to the Air Pollution Control Program's Compliance/Enforcement Section in accordance with Missouri State Rules 10 CSR 10-6.050.

Table 2: Annual Acrolein Limits

Emission Point	Description	Limit (tpy)
S40	Fermentation Scrubber	0.0438
S70	DDGS Cooling Cyclone	0.1226
S10	DDGS Dryer/Thermal Oxidizer	0.657

- B. Mid-Missouri Energy, LLC shall not discharge acrolein emissions into the atmosphere in excess of the listed hourly amounts.

Table 3: Hourly Acrolein Limits

Emission Point	Description	Limit (lb/hr)
S40	Fermentation Scrubber	0.29
S70	DDGS Cooling Cyclone	0.16
S10	DDGS Dryer/Thermal Oxidizer	0.48

- C. Mid-Missouri, LLC shall demonstrate compliance with the limits in Special Condition 3.A. by recording the monthly and the 12-month rolling total of acrolein emissions from this installation. Attachment A, or equivalent forms, shall be used for this purpose.

- D. Mid-Missouri, LLC shall demonstrate compliance with the limits in Special Condition 3.B. using the performance tests required in Special Condition 10.

4. Control Equipment - Fermentation Wet Scrubber

- A. Emissions from the four (4) fermentation tanks and the beer well shall be controlled using a wet scrubber (S40). The wet scrubber shall be operated and maintained in accordance with the manufacturer's specifications.

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- B. The scrubber shall be equipped with a gauge or meter that indicates the pressure drop across the scrubber. The scrubber shall be equipped with a flow meter that indicates the flow through the scrubber. This gauge and meter shall be located in such a way they may be easily observed by Department of Natural Resources' employees.
 - C. Mid-Missouri Energy, LLC shall monitor and record the operating pressure drop across the scrubber at least once every twenty-four (24) hours while the equipment is in operation. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - D. Mid-Missouri Energy, LLC shall monitor and record the water flow rate through the scrubber at least once every twenty-four (24) hours while the equipment is in operation. The flow rate shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - E. Mid-Missouri Energy, LLC shall use sodium bisulfite or ammonium bisulfite (or other additive) to control acetaldehyde emissions according to the rate specified by the most recent stack testing data.
 - F. Mid-Missouri Energy, LLC shall maintain an operating and maintenance log for the scrubber which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
 - 3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.
5. Control Equipment - Thermal Oxidizer
- A. The thermal oxidizer (Control Device C10) must be in use at all times when the DDGS Dryers (Device P10) or distillation operations (P50) are in operation or any time that regulated VOC or HAP emissions are being vented to the thermal oxidizer.
 - B. The thermal oxidizer shall be operated and maintained in accordance with the manufacturer's specifications.

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

- C. Emission rates of VOC and HAPs shall be tested, as detailed in Special Condition 10, to verify the thermal oxidizer is operating as assumed.
- D. The operating temperature of the thermal oxidizer shall be continuously monitored and recorded during operation. The operating temperature of the thermal oxidizer shall be maintained on a rolling 3-hour average at no more than 50 degrees Fahrenheit below the average temperature of the oxidizer recorded during the compliance test specified in Special Conditions 10 which demonstrated compliance with the emission limits. The acceptable temperature range may be reestablished by performing a new set of emission tests.
- E. Mid-Missouri Energy, LLC shall maintain an operating and maintenance log for the thermal oxidizer which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions;
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.; and
 - 3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.

6. Control Equipment - Baghouses

- A. The baghouses listed below must be in use at all times when the associated equipment is in operation:

Table 4: Equipment Controlled by Baghouses

Control ID No.	Emission Point	Emission Unit controlled
C15	S15	Grain Unloading
C30	S30	Hammermill
C90	S90	DDGS Loading
C70	S70	DDGS Cooler

- B. The baghouses and any related instrumentation or equipment shall be operated and maintained in accordance with the manufacturer's specifications. The baghouses shall be equipped with a gauge or meter that indicates the pressure drop across each baghouse. This gauge or meter shall be located in such a way it may be easily observed by Department of Natural Resources' employees.

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

- C. Replacement bags for all baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance and abrasion resistance).
 - D. The installation shall monitor and record the operating pressure drop across the baghouse at least once in every twenty four (24) hour period when the associated equipment is operated. The operating pressure drop shall be maintained within the normal operating range specified by the manufacturer's performance warranty. If the pressure drop reading should fall outside of this normal operating range, then the associated equipment shall be shut down as quickly as is reasonably practical. Corrective actions shall be taken to address the cause of the non-normal pressure drop and the baghouse(s) shall be returned to normal operation before re-starting the equipment.
 - E. The installation shall maintain an operating and maintenance log for the baghouse(s) which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
7. Control Equipment – Flare
- A. The VRS flare (EP22) must be in use at all times during denatured ethanol truck loadout. The flare shall be operated and maintained in accordance with the manufacturer's specifications.
 - B. The biomethanator flare (EP11) must be in use at all times when the DDGS Dryers (P10) are not in operation to control the biomethanator off-gases. During times when the DDGS Dryers (P10) are in operation, the biomethanator off-gases shall be vented to either the DDGS Dryers (P10) or the Biomethanator flare (EP11).
 - C. The flares shall be operated and maintained in accordance with the manufacturer's specifications.
 - D. Mid-Missouri Energy, LLC shall maintain an operating and maintenance log for the flares which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions;

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

- 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.; and
 - 3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.
8. Cooling Tower Operating Requirements
- A. The cooling tower(s) shall be operated and maintained in accordance with the manufacturer's specifications. Manufacturer's specifications shall be kept on site and made readily available to Department of Natural Resources' employees.
 - B. The cooling water circulation rate shall not exceed 1,500,000 gallons per hour (25,000 gallons per minute).
 - C. The drift loss from the towers shall not exceed 0.005 percent of the water circulation rate. Verification of drift loss shall be by manufacturer's guaranteed drift loss and shall be kept on site and made readily available to Department of Natural Resources' employees upon request.
 - D. The total dissolved solids (TDS) concentration in the circulated cooling water shall not exceed a TDS concentration of 2,500 parts per million (ppm) per sampling event. A TDS sample shall be collected and analyzed for the TDS concentration at least once per calendar month.
9. Stack Height Requirements (from Permit Number 102003-011)
Stacks S15 (Grain Unloading) and S30 (Hammermill) shall have a minimum height of 21.34 meters (70.0 feet)
10. Performance Testing
- A. Mid-MO Energy, LLC shall conduct performance tests every five years¹ to establish the VOC, combined HAP, Acetaldehyde, Acrolein, Formaldehyde, and Methanol emission rates from the fermentation scrubber outlet (S40), the thermal oxidizer outlet (S10), and the DDGS cooler outlet (S70).

¹ The most recent performance tests were conducted in February 2017; therefore, the next performance tests are required by February 2022.

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

- B. Testing shall occur at production rates representative of normal operating conditions. The maximum production rate after the performance testing shall be limited to 110% of the average production rate during the performance testing event.
- C. All applicable operating parameters (i.e. water flowrate, pH level, amount of additives, temperature, pressure, etc.) at which the stack tests are conducted shall be used to set the appropriate values used in actual operations of the wet scrubber and the thermal oxidizer.
- D. The operating parameters in Special Condition 10.D. shall be recorded on record keeping sheet(s) and be made available to department of Natural Resources personnel upon request. The frequency of the record keeping is dependent upon the parameters being kept and should be determined and agreed upon by the Air Pollution Control Program's Compliance/Enforcement Section and Mid-Missouri Energy, LLC before the start of the performance tests.
- E. The performance tests for the fermentation scrubbers (S40) shall be conducted for one of the following time periods:
 - 1) A complete cycle, defined as the time period between transferring the contents of one fermenter to the beer well and transferring the contents of the next fermenter; or
 - 2) During period(s) of representative emissions. Mid-Missouri Energy, LLC shall submit, in the proposed test plant required in Special Condition 11.A. sufficient data to determine the point(s) of representative emissions. The representative emissions are the average of 3 points identified as highest airflow, lowest airflow, and mid-range airflow going up or down the pressure curve. Testing will consist of three (3) 1-hour runs at each of the 3 points. These points must be approved by the Air Pollution Control Program's Compliance/Enforcement section prior to conducting the tests. If sufficient data is not supplied supporting these representative emission points, Mid-Missouri Energy shall conduct testing for the time period outlined in Special Condition 10.F.1)
- F. If the performance testing indicate that any of the emission rates specified in Special Condition 3 are being exceeded, Mid-Missouri

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

Energy, LLC must propose a plan to the Air Pollution Control Program within thirty (30) days of submitting the performance test results. This plan must demonstrate how Mid Missouri Energy, LLC will reduce the emission rates below those stated in Special Condition 3. Mid Missouri Energy, LLC shall implement any such plan immediately upon its approval by the Director.

11. Proposed Test Plan and Final Report

- A. For testing required in Special Condition 10.A., a completed Proposed Test Plan Form (enclosed) must be submitted to the Air Pollution Control Program at stacktesting@dnr.mo.gov 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.
- B. 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.
- C. The test report is to fully account 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, specifically:
 1. The production rate during each performance test run. Production rates for the fermentation scrubber outlet (S40) and the thermal oxidizer outlet (S10), shall be indicated in terms of gallons of ethanol. Production rates for the DDGS Cooler outlet (S70) shall be indicated in terms of tons of DDGS.
 2. The pressure drop across the scrubber and the liquid flow rate through the scrubber during each performance test run for the fermentation tanks (S40)
 3. The operating temperature of the thermal oxidizer (S10) during each performance test run.
 4. The amount of sodium bisulfite or ammonium bisulfate (or other additives) used during each performance test run for the fermentation tanks (S40)

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

- D. The test report shall also include calculations to show that the potential VOC emissions remain below the major source threshold of 100.0 tons per year, that the individual HAP emissions remain below their respective SMAL (except for acrolein), and that the combined HAP emissions remain below the major source threshold of 25.0 tons per year when using the tested rates. If the calculations show that the potential emissions of either HAPs or VOCs are greater than their respective SMAL or major source levels, a new permit review will be required. A copy of the current HAP SMAL is attached to the end of this permit.
12. **Restriction of Operational Hours**
- A. Mid-Missouri Energy, LLC shall not operate the emergency fire pump (S110) and emergency generator (S120) more than 300 hours, each, per 12-month rolling period.
 - B. Mid-Missouri Energy, LLC shall only load ethanol to rail (F55) between the hours of 7 am to 7 pm. It shall not load ethanol to rail (F55) from 7 pm to 7 am.
 - C. To demonstrate compliance with Special Condition 11.A., Mid-Missouri Energy, LLC shall keep a record of the monthly hours of operation for loading of ethanol to rail (F55). Mid-Missouri Energy, LLC shall develop its own tracking sheet for this purpose.
13. **Haul Road Requirement**
- Mid-Missouri Energy, LLC shall develop, maintain, and implement a Fugitive Dust Control Plant (FDCP) that will control emissions from haul roads. The FDCP shall, at a minimum, include control and/or cleaning methods and establish a documentation procedure for the control and/or cleaning methods.
14. **Record Keeping and Reporting Requirements**
- A. Mid-Missouri Energy, 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.

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SPECIAL CONDITIONS:

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

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

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

Project Number: 2017-05-037
Installation ID Number: 195-0046
Permit Number:

Mid-Missouri Energy, LLC
15311 N. Saline 65 Hwy
Malta Bend, MO 65339

Complete: May 15, 2017

Parent Company:
Mid-Missouri Energy, LLC
15311 N. Saline 65 Hwy
Malta Bend, MO 65339

Saline County, S24, T51N, R23W

REVIEW SUMMARY

- Mid-Missouri Energy, LLC has applied for authority to Increase production of ethanol to 60 million gallons per year.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are formaldehyde, acetaldehyde, methanol, and acrolein.
- The following NSPS applies to equipment at the ethanol plant.
 - 40 CFR 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 60 Subpart VV, *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry*
 - 40 CFR 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 60 Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*
 - 40 CFR 60 Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*
- The Maximum Achievable Control Technology (MACT), 40 CFR Part 63, Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, applies to the emergency equipment.

- None of the NESHAP applies to the equipment.
- A thermal oxidizer and a scrubber are being used to control the VOC and HAP emissions from the equipment in this permit. Baghouses are being used to control particulate emissions from the grain handling equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Emissions increases (i.e. PTE minus BAE) of all pollutants are below *de minimis* levels.
- This installation is located in Saline County, an attainment area for all criteria pollutants.
- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2, Item #20, Chemical Process Plants; However, the installation is not one of the stationary sources listed in §52.21(b)(1)(i)(a) as ethanol production facilities that produce ethanol by natural fermentation included in NAICS codes 325193 or 312140 are not included in the chemical process plant category.
- Ambient air quality modeling was performed for acrolein because it was performed for the previous permit issued to the installation (No. 092011-001) and this project will increase the acrolein emission rates for some of the emission points.
- Emissions testing for VOC and HAPs are required for this permit.
- Mid-Missouri Energy, Inc. was issued an Intermediate Operating Permit in 2016 (OP2016-010A). The installation shall either submit a modification request for this Intermediate Operating Permit within 90 days of permit issuance or a notification that it intends to apply for a Part 70 Operating Permit. The Part 70 Operating Permit application is then required within 1 year after permit issuance.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Mid-Missouri Energy is an existing ethanol production plant located in Malta Bend, Missouri. Mid-Missouri Energy is a minor source for construction permits. It currently has an intermediate operating permit (OP2016-010A). The following construction permits have been issued to Mid-Missouri Energy from the Air Pollution Control Program.

Table 5: Permit History

Permit Number	Description
092011-001	Increase the annual production from 45 million gallons per year to 60 million gallons per year.
102003-011A	Revision to permit to include chemical suppressant as a haul road control
102003-011B	Revision of thermal oxidizer limit based on testing
102003-011	Section (6) permit for the construction of a 45 million gallons per year (MMgal/yr) ethanol plant

PROJECT DESCRIPTION

Mid-Missouri Energy is proposing to increase the production capacity of the facility from 60 million gallons per year to 66 million gallons per year. No equipment will be added. The increase in production will be accomplished due to elimination of the 60 million gallons per year limit in Permit No. 092011-001.

For this project, PM₁₀ emissions will increase due to the increased handling of grain being processed. VOC emissions will increase as ethanol production increases. The only sources of NO_x, SO_x and CO are combustion emissions from the thermal oxidizer dryers, the emergency equipment, and the flares. With increased ethanol production, there will be increased drying of distillers grain solids which will require increased fuel combustion. HAPs emissions are also expected to increase with this project.

EMISSIONS/CONTROLS EVALUATION

Emissions increases from this project were determined by using the post-project potential emissions (PTE) minus the baseline actual emissions (BAE). The following methods were used to calculate the PTE and BAE. The BAE were calculated using the data from 2014-2015.

Grain Unloading (S15), Hammermill (S30), DDGS (Dry Distiller's Grain With Solubles) Cooler (S70) and DDGS Loading (S90).

Particulate emissions from the baghouse stacks were calculated using stack testing results from tests performed in May, 2012. The stack testing result was given in grains per dry standard cubic feet (gr/dscf). Therefore, the emission rates were calculated by multiplying the gr/dscf by the air flow in dry standard cubic feet per minute (dscfm). For the PTE, the emission rates were multiplied by 8,760 hours per year to obtain the annual emissions. For the BAE, the emission rates were multiplied by the actual hours of operation from 2014-2015 to obtain the annual emissions. The stack test results are for PM only, so the PM emission rate was considered PM_{2.5} and PM₁₀ as well.

For grain unloading, a 95% capture efficiency was given. This value is based on the operation being inside a building with closed doors except during truck/rail entry and exit. This value was used in the previous permit issued to the installation (092011-001) and accepted for use in this project as well. Using a much lower capture efficiency (i.e

50%) would not have had an effect on the type of permit that should be issued to the facility. Fugitive emissions were calculated using the uncontrolled grain handling emission factors in AP-42, section 9.9.1 and applying the 95% capture efficiency.

VOC and HAPs emissions from the DDGS cooler were calculated using rates from the February 2017 stack testing. A safety factor of 25% was recommended for use by the installation. This safety factor was used for the PTE but not for the BAE since BAE is based on actual emissions during the baseline period.

DDGS Dryers/Thermal Oxidizer (S10)

The WDGS (Wet Distiller's Grain With Solubles) will be stored in an open storage area, from which it can be loaded onto trucks for delivery to customers or be sent to the dryers to be dried into DDGS. The WDGS storage and handling is expected to have negligible PM₁₀ emissions due to its high moisture content. However, VOC and HAPs will be emitted from the WDGS.

The production of DDGS is expected to have higher emissions than the production of WDGS because certain equipment, such as the DDGS dryer, will not be in operation for the production of WDGS. As such, for permitting purposes, potential emissions are based on all WDGS being converted to DDGS.

Distiller's Grain is dried using drum dryers fired with natural gas. VOCs, HAPs, PM_{2.5}, and PM₁₀ are emitted from DDGS drying. VOC and HAP emissions from the DDGS dryers are controlled using the thermal oxidizer.

PM_{2.5}, PM₁₀, PM, VOCs, NO_x, sulfur oxides (SO_x) and carbon monoxide (CO) are emitted from the combustion of natural gas. PM_{2.5}, PM₁₀, PM, VOC, SO_x, and CO are also emitted from the ethanol production process. NO_x emissions are not expected from the ethanol production process.

NO_x from the combustion of natural gas for the dryer and the thermal oxidizer were calculated using emission factors from AP-42, Section 1.4, *Natural Gas Combustion* (7/98). SO_x will be emitted both because of the sulfur content in natural gas as well as the sulfuric acid used in the production process. SO_x emissions from the natural gas were calculated using emission factors from AP-42, Section 1.4. SO_x emissions from the sulfuric acid usage were calculated based on stack testing results from the May, 2012 stack test. PM_{2.5}, PM₁₀, PM, VOC, and CO emissions were calculated using results from stack tests performed in May, 2012.

Fermentation and Distillation (S40)

PM_{2.5}, PM₁₀, PM, VOCs and HAPs will be emitted from the fermentation and distillation processes. Fermentation processes and the distillation processes are controlled by wet scrubbers. VOC emissions were calculated using stack testing from 2013. Particulate emissions were calculated using stack testing information from 2012. HAPs emissions were calculated using information from stack testing performed in 2017.

Fugitive Emissions from Equipment Leaks (F60)

Fugitive VOC emissions will occur from plant piping, such as valves and pumps in light and heavy service, gas valves, compressor seals, pressure relief valves, sampling connections, and connectors. Mid-Missouri Energy is performing Leak Detection and Repair (LDAR) in accordance with NSPS, Subpart VV (40 CFR 60.480 through 60.489). Fugitive emissions from the components within the plant piping system were estimated based on EPA's Synthetic Organic Chemical Manufacturing Industry (SOCMI) emission factors in EPA document 453/R-95-017, *Protocol for Equipment Leak and Emission Estimates*. Control efficiencies listed in this document were also applied to calculations because of the implementation of the LDAR program (87% for gas valves, 84% for light liquid valves, and 69% for pumps). Since the LDAR program is required based on NSPS, Subpart VV, it is not listed as a special condition in this permit.

Storage Tanks and Ethanol Loadout (F55/56)

VOCs will be emitted from the storage tanks and truck/rail loadout. Storage Tank emissions were calculated using TANKS 4.0. Emissions from ethanol truck loadout are controlled by a smokeless, open flare. Emissions from rail loadout are uncontrolled. Loadout Emissions were determined using AP-42, Section 5.2, *Transportation and Marketing of Petroleum Liquids*. Rail loading emits higher VOCs than truck loading. Therefore, PTE were calculated assuming that 100% of the loadouts are by rail. BAE were calculated using the actual rail and truck loading information. A 98% control efficiency was used for truck loading for the use of the flare.

Individual HAPs emissions, which include Acetaldehyde, Methanol, Acrolein, and Formaldehyde were calculated using a concentration of 200 ppm. For Acetaldehyde and Methanol, this concentration is based on the highest allowable limit for air contaminants from OSHA. For acrolein and formaldehyde, this is a conservative estimate submitted by the installation. Since the storage tanks and ethanol loadout are not expected to be major sources of acrolein compared to the thermal oxidizer, the dryers, and the fermentation tanks, and this number had been previously used by the Air Pollution Control Program in Permit No. 092011-011, it was accepted for use for this project as well.

Biomethanator Flare (EP11) and VRS Flare (EP22)

The biomethanator flare only operates when the DDGS dryers are not in operation. Otherwise, the gases go to the dryer (S10) for combustion. Based on the smokeless design, there should be negligible particulate emissions. There will be NO_x, CO, VOC, and HAPs emissions from the operation of the flare. Emissions were calculated using emission factors from AP-42, Section 13.5, *Industrial Flares*, (12/2016). HAPs emissions were calculated using emission factors for natural gas combustion from AP-42, Section 1.4.

SO_x emissions are expected to be negligible due to the minimal amount of H₂S. However, to be conservative, the SO_x factor in AP-42, Section 1.4, were used to calculate the SO_x PTE. For the BAE, SO_x emissions were assumed to be zero (0)

Emergency Generator (S120) and Fire Water Pump (S110)

PM_{2.5}, PM₁₀, PM, VOC, NO_x, and CO emissions were calculated using specifications from the manufacturer. SO_x and HAPs emissions were calculated using emission factors from AP-42, Section 3.3, *Gasoline and Diesel Industrial Engines*, (10/1996). PTE were calculated assuming 300 hours of operations and this is a limit in the permit (Special Condition 12.A).

NSPS Subpart IIII does not apply to the fire pump since it was installed prior to July 1, 2006. However, MACT subpart ZZZZ does apply to the generator.

Cooling Tower

Cooling tower emissions were determined using AP-42, Section 13.4, *Wet Cooling Towers*. Cooling tower emissions were calculated assuming that the total dissolved solid content in the cooling tower is 2,500 parts per million, the drift loss is 0.005 percent, and the circulation rate is 1,500,000 gallons per hour (25,000 gallons/min).

Haul Roads

Haul road emissions were obtained from Section 13.2.1, *Paved Roads* (1/11). The silt loading for the paved road was assumed to be 1.0 g/m². The previous permit issued to the installation (No. 092011-001) required that the facility perform tests on the silt content to ensure that the 1.0 g/m² value is not exceeded. The facility is required to test at least once per quarter during the first year after permit issuance. If the average silt loading is less than 75% of the limit in four (4) consecutive tests, then testing frequency may be reduced to once per calendar year. The facility has since demonstrated that the silt loadings for four consecutive tests done once per quarter are less than 75% of the limit, and are currently on a once per year testing schedule. However, the Missouri Air Pollution Control Program has decided that since four consecutive tests show compliance with the 1.0 g/m² silt loading limit, no further testing is necessary, provided that the facility continues to implement the fugitive dust control plan developed in accordance with Special Condition 4.B. of Permit No. 092011-001. Therefore, no silt content testing condition is written into this permit. The special condition in Permit No. 092011-001 that required periodic testing of silt content has been superseded.

Table 6: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	¹ Existing Potential Emissions	Existing Actual Emissions (2016 EIQ)	BAE (tpy)	² PTE (tpy)	BAE-PTE (tpy)
PM _{2.5}	10.0	10.87	11.17	24.37	31.30	6.93
PM ₁₀	15.0	56.21	41.80	28.52	36.94	8.42
PM	25.0	N/D	N/D	31.94	41.26	9.32
SOx	40.0	39.73	2.48	3.27	3.99	0.72
NOx	40.0	85.43	58.68	59.21	86.86	27.65
VOC	40.0	<100.0	49.97	46.28	75.50	29.22
CO	100.0	<100.0	42.26	48.38	67.34	18.96
GHG-CO ₂ e	N/A	³ <100,000	N/D	92,763.15	103,557.26	8,796.11
Acetaldehyde	10.0	9.41	N/D	1.77	2.36	0.59
Acrolein	0.04	N/D	N/D	0.05	0.06	0.01
Total HAPs	25.0	24.16	N/D	3.61	14.07	10.47

N/D = Not Determined

Note 1: Existing potential emissions taken from Permit No. 092011-001.

Note 2: PTE for some pollutants were recalculated using the new yearly ethanol production limit as well as using results from stack tests performed after the issuance of Permit No. 092011-001. The stack tests showed lower emission rates than those used to calculate emissions from Permit No. 092011-001.

Therefore, some pollutants have PTE less than the existing PTE calculated for Permit No. 092011-001.

Note 3: GHG-CO₂e limit no longer required due to court action. See further explanation in the paragraphs below.

In Permit No. 092011-011, the facility is required to track the VOC and CO emissions to less than 100 tpy. It is also required to limit the combined HAP emissions and the individual HAP emissions to less than the major source level of 25.0 tpy and 10.0 tpy, respectively. PTE of the installation calculated using the latest stack testing data shows that the VOC, CO and HAP emissions are less than their respective major source levels. Therefore, these limits in Permit No. 092011-011 have been eliminated as they are no longer necessary. However, it is known that the VOC and HAPs emissions for ethanol plants may vary, and therefore, the facility is required to perform stack tests on VOC and HAPs once every five years to verify the emission rates. Once the emission rates are determined, the facility must use the emission rates to calculate the installation-wide PTE to ensure that they are still less than their respective major source levels. If the calculations show that the potential emissions of either HAPs or VOCs are greater than their respective SMAL or major source levels, a new permit review will be required.

In Permit 092011-011, the facility is also limited to 1,660 million standard cubic feet of natural gas usage so that the carbon dioxide equivalent (CO₂e) emissions are less than the major source level of 100,000 tons per year. However, court decisions since the issuance of this permit has held that the EPA may not treat GHG as an air pollutant for the purpose of determining whether the source is a major source required to obtain a PSD permit. Instead, PSD for GHG emissions is only required if other pollutants trigger

the need for a PSD permit. Since no other pollutants triggers the need for a PSD permit, all natural gas usage limits have been eliminated as this facility is no longer required to limit the CO_{2e} emissions to less than 100,000 tons per year.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. The increases in emissions for all pollutants are less than their respective de minimis levels.

APPLICABLE REQUIREMENTS

Mid-Missouri Energy, LLC 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
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *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

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400

- *New Source Performance Regulations, 10 CSR 10-6.070 – New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60, Subpart Dc*
- *New Source Performance Regulations, 10 CSR 10-6.070 – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*
- *New Source Performance Regulations, 10 CSR 10-6.070 – New Source Performance Standards (NSPS) 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 , 40 CFR Part 60, Subpart VV*
- *New Source Performance Regulations, 10 CSR 10-6.070 – New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006.*
- *New Source Performance Regulations, 10 CSR 10-6.070 – New Source Performance Standards (NSPS) for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction or Modification Commenced After July 23, 1984, 40 CFR Part 60, Subpart Kb*
- *Maximum Achievable Control Technology, 10 CFR 10-6.075 - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, Subpart ZZZZ*
- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating, 10 CSR 10-3.060*

AMBIENT AIR QUALITY IMPACT ANALYSIS

In Permit No. 092011-001, acrolein emissions were modeled because the emissions increase was greater than the SMAL of 0.04 tpy. Increasing the annual ethanol production to 66 million gallons will increase the emissions from some of the acrolein emission points. Therefore, acrolein emissions must be modeled again to ensure that the RAL is not exceeded.

A refined modeling analysis was performed to determine the impact of acrolein emissions at or beyond the property boundary of the facility. The results are summarized in Table 6. For complete modeling information, refer to the memorandum entitled, "Ambient Air Quality Impact Analysis (AAQIA) for Mid-Missouri Energy, Inc. – Production Increase."

Table 7: Screen Modeling Results for Acrolein

Pollutant	Modeled Impact ($\mu\text{g}/\text{m}^3$)	RAL ($\mu\text{g}/\text{m}^3$)	Time Period
Acrolein	2.2	6.9	24-hour
	0.02	0.02	Annual

Note 1: The actual value is $0.024 \mu\text{g}/\text{m}^3$, but this is deemed to be in compliance based on significant digits.

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.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated May 11, 2017, received May 15, 2017, designating Mid-Missouri Energy, LLC as the owner and operator of the installation.

Document relied upon in preparation of this permit.

- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Performance testing report from tests conducted in 2012, 2013, and 2017.
- E-mail communication between the Missouri Air Pollution Control Program and Air Resource Specialists, designated by Mid-Missouri Energy, LLC as the contact for this permit.

Attachment A: Acrolein Compliance Tracking Record

Mid-Missouri Energy, LLC
 Saline County, S24, T51N, R23W
 Project Number: 2017-05-037
 Installation ID Number: 195-0046
 Permit Number:

092017-009

This sheet covers the month of _____ in the year _____ for emission point _____

(Copy this sheet as needed)

Column A	Column B	Column C	Column D	Column E
Emission Point(s)	Description	Amount Processed (tons or Mgal)	(a) Acrolein Emission Factor (EF) in lb/ton or lb/Mgal	(b) Acrolein Emissions (tons)
(c) The total amount of acrolein from the previous eleven (11) months (tons):				
(d) Emissions from Startup, Shutdown, and Malfunction (tons):				
(e) Current 12-month Total of Individual HAP Emissions in Tons : [(c) + (d) - (e)]				

- (a) EF for the fermentation scrubber (S40), DDGS Cyclone (S70), and the DDGS Dryer/Thermal Oxidizer (S10) shall be taken from the most recent stack tests.
- (b) [Column E] = [Column C] x [Column D] ÷ 2,000 lb/ton.
- (c) Sum the acrolein emissions (ton) from the previous eleven (11) months.
- (d) Input the emissions from startup, shutdown, and malfunction for this month and the previous eleven (11) months as reported to the Compliance/Enforcement Section in accordance with Missouri State Rules 10 CSR 10-6.050
- (e) Calculate the new 12-month Individual HAP emissions total by adding the acrolein emissions of this month, emissions from startup shutdown, and malfunction, and the emissions of the previous eleven (11) months

A 12-Month acrolein emissions total (d) of less than the following indicates compliance. For S40, 0.0438 tpy; For S70, 0.1226 tpy; and For S10, 0.657 tpy.

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
CO₂e	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		

Air Pollution Control Program
Table of Hazardous Air Pollutants and Screening Model Action Levels

Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM	Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM
ACETALDEHYDE	75-07-0	9		Y	N	CHLOROMETHYL METHYL ETHER	107-30-2	0.1		Y	N
ACETAMIDE	60-35-5	1		Y	N	CHLOROPRENE	126-99-8	1		Y	N
ACETONITRILE	75-05-8	4		Y	N	CHROMIUM (VI) COMPOUNDS		0.002	L	N	Y
ACETOPHENONE	98-86-2	1		Y	N	CHROMIUM COMPOUNDS		5	L	N	Y
ACETYLAMINOFLUORINE, [2-]	53-96-3	0.005	V	Y	Y	CHRYSENE	218-01-9	0.01	V	Y	N
ACROLEIN	107-02-8	0.04		Y	N	COBALT COMPOUNDS		0.1	M	N	Y
ACRYLAMIDE	79-06-1	0.02		Y	N	COKE OVEN EMISSIONS	8007-45-2	0.03	N	Y	N
ACRYLIC ACID	79-10-7	0.6		Y	N	CRESOL, [META-]	108-39-4	1	B	Y	N
ACRYLONITRILE	107-13-1	0.3		Y	N	CRESOL, [ORTHO-]	95-48-7	1	B	Y	N
ALLYL CHLORIDE	107-05-1	1		Y	N	CRESOL, [PARA-]	106-44-5	1	B	Y	N
AMINOBIIPHENYL, [4-]	92-67-1	1	V	Y	N	CRESOLS (MIXED ISOMERS)	1319-77-3	1	B	Y	N
ANILINE	62-53-3	1		Y	N	CUMENE	98-82-8	10		Y	N
ANISIDINE, [ORTHO-]	90-04-0	1		Y	N	CYANIDE COMPOUNDS		0.1	O	Y	N
ANTHRACENE	120-12-7	0.01	V	Y	N	DDE	72-55-9	0.01	V	Y	Y
ANTIMONY COMPOUNDS		5	H	N	Y	DI(2-ETHYLHEXYL) PHTHALATE, (DEHP)	117-81-7	5		Y	N
ANTIMONY PENTAFLUORIDE	7783-70-2	0.1	H	N	Y	DIAMINOTOLUENE, [2,4-]	95-80-7	0.02		Y	N
ANTIMONY POTASSIUM TARTRATE	28300-74-5	1	H	N	Y	DIAZOMETHANE	334-98-3	1		Y	N
ANTIMONY TRIOXIDE	1309-64-4	1	H	N	Y	DIBENZ(A,H)ANTHRACENE	53-70-3	0.01	V	Y	N
ANTIMONY TRISULFIDE	1345-04-6	0.1	H	N	Y	DIOXINS/FURANS		6E-07	D,V	Y	N
ARSENIC COMPOUNDS		0.005	I	N	Y	DIBENZOFURAN	132-64-9	5	V	Y	N
ASBESTOS	1332-21-4	0	A	N	Y	DIBROMO-3-CHLOROPROPANE, [1,2-]	96-12-8	0.01		Y	N
BENZ(A)ANTHRACENE	56-55-3	0.01	V	Y	N	DIBROMOETHANE, [1,2-]	106-93-4	0.1		Y	N
BENZENE	71-43-2	2		Y	N	DIBUTYL PHTHALATE	84-74-2	10		Y	Y
BENZIDINE	92-87-5	0.0003	V	Y	N	DICHLOROENZENE, [1,4-]	106-46-7	3		Y	N
BENZO(A)PYRENE	50-32-8	0.01	V	Y	N	DICHLOROENZIDINE, [3,3-]	91-94-1	0.2	V	Y	Y
BENZO(B)FLUORANTHENE	205-99-2	0.01	V	Y	N	DICHLOROETHANE, [1,1-]	75-34-3	1		Y	N
BENZO(K)FLUORANTHENE	207-08-9	0.01	V	Y	N	DICHLOROETHANE, [1,2-]	107-06-2	0.8		Y	N
BENZOTRICHLORIDE	98-07-7	0.006		Y	N	DICHLOROETHYLENE, [1,1-]	75-35-4	0.4		Y	N
BENZYL CHLORIDE	100-44-7	0.1		Y	N	DICHLOROMETHANE	75-09-2	10		N	N
BERYLLIUM COMPOUNDS		0.008	J	N	Y	DICHLOROPHENOXY ACETIC ACID, [2,4-]	94-75-7	10	C	Y	Y
BERYLLIUM SALTS		2E-05	J	N	Y	DICHLOROPROPANE, [1,2-]	78-87-5	1		Y	N
BIPHENYL, [1,1-]	92-52-4	10	V	Y	N	DICHLOROPROPENE, [1,3-]	542-75-6	1		Y	N
BIS(CHLOROETHYL)ETHER	111-44-4	0.06		Y	N	DICHLOROVOS	62-73-7	0.2		Y	N
BIS(CHLOROMETHYL)ETHER	542-88-1	0.0003		Y	N	DIETHANOLAMINE	111-42-2	5		Y	N
BROMOFORM	75-25-2	10		Y	N	DIETHYL SULFATE	64-67-5	1		Y	N
BROMOMETHANE	74-83-9	10		Y	N	DIETHYLENE GLYCOL MONOBUTYL ETHER	112-34-5	5	P	Y	N
BUTADIENE, [1,3-]	106-99-0	0.07		Y	N	DIMETHOXYBENZIDINE, [3,3-]	119-90-4	0.1	V	Y	Y
BUTOXYETHANOL ACETATE, [2-]	112-07-2	5	P	Y	N	DIMETHYL BENZIDINE, [3,3-]	119-93-7	0.008	V	Y	Y
BUTYLENE OXIDE, [1,2-]	106-88-7	1		Y	N	DIMETHYL CARBAMOYL CHLORIDE	79-44-7	0.02		Y	N
CADMIUM COMPOUNDS		0.01	K	N	Y	DIMETHYL FORMAMIDE	68-12-2	1		Y	N
CALCIUM CYANAMIDE	156-62-7	10		Y	Y	DIMETHYL HYDRAZINE, [1,1-]	57-14-7	0.008		Y	N
CAPROLACTAM (Delisted)	105-60-2					DIMETHYL PHTHALATE	131-11-3	10		Y	N
CAPTAN	133-06-2	10		Y	Y	DIMETHYL SULFATE	77-78-1	0.1		Y	N
CARBARYL	63-25-2	10	V	Y	Y	DIMETHYLAMINOAZOBENZENE, [4-]	60-11-7	1		Y	N
CARBON DISULFIDE	75-15-0	1		Y	N	DIMETHYLANILINE, [N-N-]	121-69-7	1		Y	N
CARBON TETRACHLORIDE	56-23-5	1		Y	N	DINITRO-O-CRESOL, [4,6-] (Note 6)	534-52-1	0.1	E	Y	Y
CARBONYL SULFIDE	463-58-1	5		Y	N	DINITROPHENOL, [2,4-]	51-28-5	1		Y	N
CATECHOL	120-80-9	5		Y	N	DINITROTOLUENE, [2,4-]	121-14-2	0.02		Y	N
CHLORAMBEN	133-90-4	1		Y	Y	DIOXANE, [1,4-]	123-91-1	6		Y	N
CHLORDANE	57-74-9	0.01		Y	Y	DIPHENYLHYDRAZINE, [1,2-]	122-66-7	0.09	V	Y	Y
CHLORINE	7782-50-5	0.1		N	N	DIPHENYLMETHANE DIISOCYANATE, [4,4-]	101-68-8	0.1	V	Y	N

Air Pollution Control Program

Table of Hazardous Air Pollutants and Screening Model Action Levels

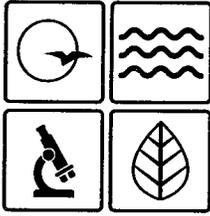
Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM	Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM
CHLOROACETIC ACID	79-11-8	0.1		Y	N	EPICHLOROHYDRIN	106-89-8	2		Y	N
CHLOROACETOPHENONE, [2-]	532-27-4	0.06		Y	N	ETHOXYETHANOL, [2-]	110-80-5	10	P	Y	N
CHLOROBENZENE	108-90-7	10		Y	N	ETHOXYETHYL ACETATE, [2-]	111-15-9	5	P	Y	N
CHLOROBENZILATE	510-15-6	0.4	V	Y	Y	ETHYL ACRYLATE	140-88-5	1		Y	N
CHLOROFORM	67-66-3	0.9		Y	N	ETHYL BENZENE	100-41-4	10		Y	N
ETHYL CHLORIDE	75-00-3	10		Y	N	NITROBENZENE	98-95-3	1		Y	N
ETHYLENE GLYCOL	107-21-1	10		Y	N	NITROBIPHENYL, [4-]	92-93-3	1	V	Y	N
ETHYLENE GLYCOL MONOBUTYL ETHER (Delisted)	111-76-2					NITROPHENOL, [4-]	100-02-7	5		Y	N
ETHYLENE GLYCOL MONOHEXYL ETHER	112-25-4	5	P	Y	N	NITROPROPANE, [2-]	79-46-9	1		Y	N
ETHYLENE IMINE [AZIRIDINE]	151-56-4	0.003		Y	N	NITROSODIMETHYLAMINE, [N-]	62-75-9	0.001		Y	N
ETHYLENE OXIDE	75-21-8	0.1		Y	N	NITROSOMORPHOLINE, [N-]	59-89-2	1		Y	N
ETHYLENE THIOUREA	96-45-7	0.6		Y	Y	NITROSO-N-METHYLUREA, [N-]	684-93-5	0.0002		Y	N
FORMALDEHYDE	50-00-0	2		Y	N	OCTACHLORONAPHTHALENE	2234-13-1	0.01	V	Y	N
GLYCOL ETHER (ETHYLENE GLYCOL ETHERS)		5	P	Y	N	PARATHION	56-38-2	0.1		Y	Y
GLYCOL ETHER (DIETHYLENE GLYCOL ETHERS)		5	P	Y	N	PCB [POLYCHLORINATED BIPHENYLS]	1336-36-3	0.009	X	Y	Y
HEPTACHLOR	76-44-8	0.02		Y	N	PENTACHLORONITROBENZENE	82-68-8	0.3		Y	N
HEXACHLOROBENZENE	118-74-1	0.01		Y	N	PENTACHLOROPHENOL	87-86-5	0.7		Y	N
HEXACHLOROBUTADIENE	87-68-3	0.9		Y	N	PHENOL	108-95-2	0.1		Y	N
HEXACHLOROCYCLOHEXANE, [ALPHA-]	319-84-6	0.01	F	Y	N	PHENYLENEDIAMINE, [PARA-]	106-50-3	10		Y	N
HEXACHLOROCYCLOHEXANE, [BETA-]	319-85-7	0.01	F	Y	N	PHOSGENE	75-44-5	0.1		Y	N
HEXACHLOROCYCLOHEXANE, [DELTA-]	319-86-8	0.01	F	Y	N	PHOSPHINE	7803-51-2	5		N	N
HEXACHLOROCYCLOHEXANE, [TECHNICAL]	608-73-1	0.01	F	Y	N	PHOSPHOROUS (YELLOW OR WHITE)	7723-14-0	0.1		N	N
HEXACHLOROCYCLOPENTADIENE	77-47-4	0.1		Y	N	PHTHALIC ANHYDRIDE	85-44-9	5		Y	N
HEXACHLOROETHANE	67-72-1	5		Y	N	POLYCYLIC ORGANIC MATTER		0.01	V	Y	N
HEXAMETHYLENE, -1,6-DIISOCYANATE	822-06-0	0.02		Y	N	PROPANE SULTONE, [1,3-]	1120-71-4	0.03		Y	Y
HEXAMETHYLPHOSPHORAMIDE	680-31-9	0.01		Y	N	PROPIOLACTONE, [BETA-]	57-57-8	0.1		Y	N
HEXANE, [N-]	110-54-3	10		Y	N	PROPIONALDEHYDE	123-38-6	5		Y	N
HYDRAZINE	302-01-2	0.004		N	N	PROPOXUR [BAYGON]	114-26-1	10		Y	Y
HYDROGEN CHLORIDE	7647-01-0	10		N	N	PROPYLENE OXIDE	75-56-9	5		Y	N
HYDROGEN FLUORIDE	7664-39-3	0.1		N	N	PROPYLENEIMINE, [1,2-]	75-55-8	0.003		Y	N
HYDROQUINONE	123-31-9	1		Y	N	QUINOLINE	91-22-5	0.006		Y	N
INDENO(1,2,3CD)PYRENE	193-39-5	0.01	V	Y	N	QUINONE	106-51-4	5		Y	N
ISOPHORONE	78-59-1	10		Y	N	RADIONUCLIDES		Note 1	Y	N	Y
LEAD COMPOUNDS		0.01	Q	N	Y	SELENIUM COMPOUNDS		0.1	W	N	Y
LINDANE [GAMMA-HEXACHLOROCYCLOHEXANE]	58-89-9	0.01	F	Y	N	STYRENE	100-42-5	1		Y	N
MALEIC ANHYDRIDE	108-31-6	1		Y	N	STYRENE OXIDE	96-09-3	1		Y	N
MANGANESE COMPOUNDS		0.8	R	N	Y	TETRACHLORODIBENZO-P-DIOXIN, [2,3,7,8]	1746-01-6	6E-07	D,V	Y	Y
MERCURY COMPOUNDS		0.01	S	N	N	TETRACHLOROETHANE, [1,1,2,2-]	79-34-5	0.3		Y	N
METHANOL	67-56-1	10		Y	N	TETRACHLOROETHYLENE	127-18-4	10		N	N
METHOXYCHLOR	72-43-5	10	V	Y	Y	TITANIUM TETRACHLORIDE	7550-45-0	0.1		N	N
METHOXYETHANOL, [2-]	109-86-4	10	P	Y	N	TOLUENE	108-88-3	10		Y	N
METHYL CHLORIDE	74-87-3	10		Y	N	TOLUENE DIISOCYANATE, [2,4-]	584-84-9	0.1		Y	N
METHYL ETHYL KETONE (Delisted)	78-93-3					TOLUIDINE, [ORTHO-]	95-53-4	4		Y	N
METHYL HYDRAZINE	60-34-4	0.06		Y	N	TOXAPHENE	8001-35-2	0.01		Y	N
METHYL IODIDE	74-88-4	1		Y	N	TRICHLOROBENZENE, [1,2,4-]	120-82-1	10		Y	N
METHYL ISOBUTYL KETONE	108-10-1	10		Y	N	TRICHLOROETHANE, [1,1,1-]	71-55-6	10		N	N
METHYL ISOCYANATE	624-83-9	0.1		Y	N	TRICHLOROETHANE, [1,1,2-]	79-00-5	1		Y	N
METHYL METHACRYLATE	80-62-6	10		Y	N	TRICHLOROETHYLENE	79-01-6	10		Y	N
METHYL TERT-BUTYL ETHER	1634-04-4	10		Y	N	TRICHLOROPHENOL, [2,4,5-]	95-95-4	1		Y	N
METHYLCYCLOPENTADIENYL MANGANESE	12108-13-3	0.1	R	N	Y	TRICHLOROPHENOL, [2,4,6-]	88-06-2	6		Y	N
METHYLENE BIS(2-CHLOROANILINE), [4,4-]	101-14-4	0.2	V	Y	Y	TRIETHYLAMINE	121-44-8	10		Y	N



Air Pollution Control Program Table of Hazardous Air Pollutants and Screening Model Action Levels

Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM	Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM
METHYLENEDIANILINE, [4,4-]	101-77-9	1	V	Y	N	TRIFLURALIN	1582-09-8	9		Y	Y
METHYLNAPHTHALENE, [2-]	91-57-6	0.01	V	Y	N	TRIMETHYLPENTANE, [2,2,4-]	540-84-1	5		Y	N
MINERAL FIBERS		0	T	N	Y	URETHANE [ETHYL CARBAMATE]	51-79-6	0.8		Y	N
NAPHTHALENE	91-20-3	10	V	Y	N	VINYL ACETATE	108-05-4	1		Y	N
NAPHTHYLAMINE, [ALPHA-]	134-32-7	0.01	V	Y	N	VINYL BROMIDE	593-60-2	0.6		Y	N
NAPHTHYLAMINE, [BETA-]	91-59-8	0.01	V	Y	N	VINYL CHLORIDE	75-01-4	0.2		Y	N
NICKEL CARBONYL	13463-39-3	0.1	U	N	Y	XYLENE, [META-]	108-38-3	10	G	Y	N
NICKEL COMPOUNDS		1	U	N	Y	XYLENES (MIXED ISOMERS)	1330-20-7	10	G	Y	N
NICKEL REFINERY DUST		0.08	U	N	Y						
NICKEL SUBSULFIDE	12035-72-2	0.04	U	N	Y						

Legend	
Group ID	
A	Asbestos
B	Cresols/Cresylic Acid (isomers and mixtures)
C	2,4 - D, Salts and Esters
D	Dibenzofurans, Dibenzodioxins
E	4, 6 Dinitro-o-cresol, and Salts
F	Lindane (all isomers)
G	Xylenes (all isomers and mixtures)
H	Antimony Compounds
I	Arsenic Compounds
J	Beryllium Compounds
K	Cadmium Compounds
L	Chromium Compounds
M	Cobalt Compounds
N	Coke Oven Emissions
O	Cyanide Compounds
P	Glycol Ethers
Q	Lead Compounds (except elemental Lead)
R	Manganese Compounds
S	Mercury Compounds
T	Fine Mineral Fibers
U	Nickel Compounds
V	Polycyclic Organic Matter
W	Selenium Compounds
X	Polychlorinated Biphenyls (Aroclors)
Y	Radionuclides
Notes	The SMAL for radionuclides is defined as the effective dose equivalent to 0.3 millirems per year for 7 years exposure associated with a cancer risk of 1 in 1 million



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

SEP 25 2017

Mr. Tyler Edmundson
Plant Manager
Mid-Missouri Energy, LLC
15311 N. Saline 65 Hwy
Malta Bend, MO 65339

RE: New Source Review Permit - Project Number: 2017-05-037

Dear Mr. Edmundson:

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 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.

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 your local 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 Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty 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.



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Mr. Tyler Edmundson
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If you have any questions regarding this permit, please do not hesitate to contact Chia-Wei Young, at the Department's 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

Kendall B. Hale for

Susan Heckenkamp
New Source Review Unit Chief

SH:cyl

Enclosures

c: Northeast Regional Office
PAMS File: 2017-05-037

Permit Number: **092017-009**