

**Title V Air Permit Application
Significant Source Modification
Significant Permit Modification**

Received
State of Indiana JFJ/
JUN 28 2024
Dept of Environmental Mgmt
Office of Air Quality

**POET Biorefining – North Manchester, LLC
North Manchester, Indiana
Title V Permit No. 169-45835-00068**

June 25, 2024

Modification Description

POET Biorefining – North Manchester, LLC (POET) is submitting the enclosed application for a significant source modification and a significant permit modification for an operational change. POET will introduce a processing aid to mitigate mycotoxins in the dried distiller's grain by-product. The addition of this processing aid will result in SO₂ emissions from SV009, SV010, SV011, and SV012.

Regulatory Analysis

The attached Potential to Emit Calculations (PTE) include the potential emissions for each of the above listed stack vents. As indicated on the PTE, the facility wide emissions will remain below PSD major source thresholds.

This operational change may lead to a small amount of additional Hazardous Air Pollutants (HAPs), which are included on the attached PTE. POET will remain an area source of HAPs.

This modification will not impact the applicability of any NSPS or NESHAP to POET.

The existing control devices are not used to reduce SO₂ to achieve emission limits, therefore Compliance Assurance Monitoring (CAM) is not impacted by this modification.

This modification does not impact the applicability of 326 IAC 8-5-6 or 326 IAC 8-1-6. POET will continue to comply with these requirements with the existing control equipment and associated air permit requirements.



AIR PERMIT APPLICATION COVER SHEET
 State Form 50639 (R4 / 1-10)
 INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this cover sheet is to obtain the core information needed to process the air permit application. This cover sheet is required for all air permit applications submitted to IDEM, OAQ. Place this cover sheet on top of all subsequent forms and attachments that encompass your air permit application packet.
- Submit the completed air permit application packet, including all forms and attachments, to IDEM Air Permits Administration using the address in the upper right hand corner of this page.
- IDEM will send a bill to collect the filing fee and any other applicable fees.
- Detailed instructions for this form are available on the Air Permit Application Forms website.

FOR OFFICE USE ONLY

PERMIT NUMBER:

169-48019-00068

DATE APPLICATION WAS RECEIVED:

Received
 State of Indiana

JFJ/

JUN 28 2024

Dept of Environmental Mgmt
 Office of Air Quality

1. **Tax ID Number:**

PART A: Purpose of Application

Part A identifies the purpose of this air permit application. For the purposes of this form, the term "source" refers to the plant site as a whole and NOT to individual emissions units.

2. **Source / Company Name:** POET Biorefining - North Manchester, LLC 3. **Plant ID:** 169 -- 00068

4. **Billing Address:** 868 E 800 N

City: North Manchester **State:** IN **ZIP Code:** 46962 -

5. **Permit Level:** Exemption Registration SSOA MSOP FESOP TVOP PBR

6. **Application Summary:** Check all that apply. Multiple permit numbers may be assigned as needed based on the choices selected below.

- | | | |
|---|---|--|
| <input type="checkbox"/> Initial Permit | <input type="checkbox"/> Renewal of Operating Permit | <input type="checkbox"/> Asphalt General Permit |
| <input type="checkbox"/> Review Request | <input type="checkbox"/> Revocation of Operating Permit | <input type="checkbox"/> Alternate Emission Factor Request |
| <input type="checkbox"/> Interim Approval | <input type="checkbox"/> Relocation of Portable Source | <input type="checkbox"/> Acid Deposition (Phase II) |
| <input type="checkbox"/> Site Closure | <input type="checkbox"/> Emission Reduction Credit Registry | |

- Transition (between permit levels) *From:* _____ *To:* _____
- Administrative Amendment: Company Name Change Change of Responsible Official
- Correction to Non-Technical Information Notice Only Change
- Other (specify): _____

- Modification: New Emission Unit or Control Device Modified Emission Unit or Control Device
- New Applicable Permit Requirement Change to Applicability of a Permit Requirement
- Prevention of Significant Deterioration Emission Offset MACT Preconstruction Review
- Minor Source Modification Significant Source Modification
- Minor Permit Modification Significant Permit Modification
- Other (specify): _____

7. Is this an application for an initial construction and/or operating permit for a "Greenfield" Source? Yes No

8. Is this an application for construction of a new emissions unit at an Existing Source? Yes No

PART B: Pre-Application Meeting

Part B specifies whether a meeting was held or is being requested to discuss the permit application.

9. Was a meeting held between the company and IDEM prior to submitting this application to discuss the details of the project?

No Yes: *Date:*

10. Would you like to schedule a meeting with IDEM management and your permit writer to discuss the details of this project?

No Yes: *Proposed Date for Meeting:*

PART C: Confidential Business Information

Part C identifies permit applications that require special care to ensure that confidential business information is kept separate from the public file.

Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in the Indiana Administrative Code (IAC). To ensure that your information remains confidential, refer to the IDEM, OAQ information regarding submittal of confidential business information. For more information on confidentiality for certain types of business information, please review IDEM's Nonrule Policy Document Air-031-NPD regarding Emission Data.

11. Is any of the information contained within this application being claimed as **Confidential Business Information**?

No Yes

PART D: Certification Of Truth, Accuracy, and Completeness

Part D is the official certification that the information contained within the air permit application packet is truthful, accurate, and complete. Any air permit application packet that we receive without a signed certification will be deemed incomplete and may result in denial of the permit.

For a Part 70 Operating Permit (TVOP) or a Source Specific Operating Agreement (SSOA), a "responsible official" as defined in 326 IAC 2-7-1(34) must certify the air permit application. For all other applicants, this person is an "authorized individual" as defined in 326 IAC 2-1.1-1(1).

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete.

David Pyle
Name (typed)

General Manager
Title

Signature

6/25/2024
Date



OAQ AIR PERMIT APPLICATION – FORMS CHECKLIST

State Form 51607 (R5 / 1-10)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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NOTES:

- The purpose of this checklist is to help the applicant and IDEM, OAQ ensure that the air permit application packet is administratively complete. This checklist is a required form.
- Check the appropriate box indicating whether each application form is applicable for the current permit application. The source must submit only those forms pertinent to the current permit application.
- Place this checklist between the cover sheet and all subsequent forms and attachments that encompass your air permit application packet.

Part A: General Source Data				
Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	COVER	Application Cover Sheet	50639	Include for every application, modification, and renewal, including source specific operating agreements (SSOA).
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	CHECKLIST	Forms Checklist	51607	Include for every application, modification, and renewal, including SSOA.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	GSD-01	Basic Source Level Information	50640	Include for every application, modification, and renewal, including SSOA.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	GSD-02	Plant Layout Diagram	51605	Include for every new source application, and modification.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	GSD-03	Process Flow Diagram	51599	Include one for every process covered by the application.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	GSD-04	Stack / Vent Information	51606	Include for every new source application, and modification.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	GSD-05	Emissions Unit Information	51610	Include for every process covered by the application.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-06	Particulate Emissions Summary	51612	Include if the process has particulate emissions (PM).
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	GSD-07	Criteria Pollutant Emissions Summary	51602	Include if the process has criteria pollutant emissions.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	GSD-08	HAP Emissions Summary	51604	Include if the process has hazardous air pollutant emissions (HAP).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-09	Summary of Additional Information	51611	Include if the additional information is included.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-10	Insignificant Activities	51596	Include if there are unpermitted insignificant activities.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-11	Alternative Operating Scenario	51601	Include if an AOS is requested.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-12	Affidavit of Nonapplicability	51600	Include if the standard notification requirements do not apply.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-13	Affidavit of Applicability	51603	Include if the standard notification requirements apply.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-14	Owners and Occupants Notified	51609	Include if the standard notification requirements apply.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	GSD-15	Government Officials Notified	51608	Include if the standard notification requirements apply.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	RENEWAL	Renewal Checklist	51755	Include with every operating permit renewal packet.

Part J: Source Specific Operating Agreements (SSOA)

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-01	Summary of Application and Existing Agreements	53438	Submit if you are applying for or modifying a Source Specific Operating Agreement.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-02	Industrial / Commercial Surface Coating Operations -OR- Graphic Arts Operations (326 IAC 2-9-2.5)	53439	Submit if you are applying for or modifying a SSOA for industrial or commercial surface coating operations not subject to 326 IAC 8-2; or graphic arts operations not subject to 326 IAC 8-5-5.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-03	Surface Coating or Graphic Arts Operations (326 IAC 2-9-3)	53440	Submit if you are applying for or modifying a SSOA for surface coating or graphic arts operations.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-04	Woodworking Operations (326 IAC 2-9-4)	53441	Submit if you are applying for or modifying a SSOA for woodworking operations.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-05	Abrasive Cleaning Operations (326 IAC 2-9-5)	53442	Submit if you are applying for or modifying a SSOA for abrasive cleaning operations.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-06	Grain Elevators (326 IAC 2-9-6)	53443	Submit if you are applying for or modifying a SSOA for grain elevators.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-07	Sand And Gravel Plants (326 IAC 2-9-7)	53444	Submit if you are applying for or modifying a SSOA for sand and gravel plants.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-08	Crushed Stone Processing Plants (326 IAC 2-9-8)	53445	Submit if you are applying for or modifying a SSOA for crushed stone processing plants.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-09	Ready-Mix Concrete Batch Plants (326 IAC 2-9-9)	53446	Submit if you are applying for or modifying a SSOA for ready-mix concrete batch plants.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-10	Coal Mines And Coal Preparation Plants (326 IAC 2-9-10)	53447	Submit if you are applying for or modifying a SSOA for coal mines and coal preparation plants.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-11	Automobile Refinishing Operations (326 IAC 2-9-11)	53448	Submit if you are applying for or modifying a SSOA for automobile refinishing operations.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-12	Degreasing Operations (326 IAC 2-9-12)	53449	Submit if you are applying for or modifying a SSOA for degreasing operations.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-13	External Combustion Sources (326 IAC 2-9-13)	53450	Submit if you are applying for or modifying a SSOA for external combustion sources.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	OA-14	Internal Combustion Sources (326 IAC 2-9-14)	53451	Submit if you are applying for or modifying a SSOA for internal combustion sources.

Part G: Plantwide Applicability Limits				
Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PAL-01	Actuals Plantwide Applicability Limit	52451	Include if the modification results in emission reductions.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PAL-02	Revised Plantwide Applicability Limit	52452	Submit whenever registered emission credits are transferred.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PAL-03	Plantwide Applicability Limit Renewal	52453	Include if the modification requires the use of emission credits for offsets.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PAL-04	Request for Termination of Plantwide Applicability Limit	52454	Submit if you are looking for emission credits for offsets.

Part H: Air Toxics				
Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	FED-01	Summary of Federal Requirements – NSPS & NESHAP	53512	Include for each 40 CFR Part 60 NSPS, 40 CFR Part 61 NESHAP, and 40 CFR Part 63 NESHAP applicable to the process.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	FED-02	MACT Pre-Construction Review	51905	Include if constructing or modifying a process subject to a Part 63 NESHAP.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	No Form ID	MACT Initial Notification	None	This form is available on the U.S. EPA website. Completed notifications should be submitted to the IDEM Compliance Branch.

Part I: Special Permits				
Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	INTERIM	Interim Approval	None	Submit if you are applying for interim operating approval.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	ASPHALT	Asphalt General Permit	None	Submit if you are applying for or modifying an asphalt plant general permit.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	NOXBTP	NO _x Budget Permit	None	Submit if you are a power plant or if you have opted in to the NO _x budget trading program.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	ACIDRAIN	Phase 2 Acid Rain Permit	None	Submit if you are applying for, modifying, or renewing a Phase 2 Acid Rain permit.

Part D: Compliance Determination for Part 70 Sources

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	CD-01	Emissions Unit Compliance Status	51861	Include for every Title V application, including modifications.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CD-02	Compliance Plan by Applicable Requirement	51862	Include for every Title V application, including modifications.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	CD-03	Compliance Plan by Emissions Unit	51863	Include for every Title V application, including modifications.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	CD-04	Compliance Schedule and Certification	51864	Include for every Title V application, including modifications and renewal.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	FED-03	Compliance Assurance Monitoring	53377	Include for every Title V application, including modifications.

Part E: Best Available Control Technology

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	BACT-01	Analysis of Best Available Control Technology	None	Include for every BACT application.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	BACT-01a	Background Search: Existing BACT Determinations	None	Include for every BACT application.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	BACT-01b	Cost/Economic Impact Analysis	None	Include for every BACT application.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	BACT-02	Summary of Best Available Control Technology	None	Include for every BACT application.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PSD / EO-01	PSD / Emission Offset Checklist	None	Include for every PSD application and every NSR application that requires emission offsets.

Part F: Emission Credit Registry

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	EC-01	Generation of Emission Credits	51783	Include if the modification results in emission reductions.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	EC-02	Transfer of Emission Credits	51784	Submit whenever registered emission credits are transferred.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	EC-03	Use of Emission Credits	51785	Include if the modification requires the use of emission credits for offsets.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	EC-04	Emission Credit Request	51906	Submit if you are looking for emission credits for offsets.

Part B: Process Information				
Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-17	Blasting Operations	52558	Include for each blasting process (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-18	Mineral Processing	52559	Include if the process involves mineral processing (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-19	Surface Coating & Printing Operations	52560	Include for each surface coating or printing process (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-20	Woodworking / Plastic Machining	52561	Include for each woodworking or plastic machining process (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-21	Site Remediation	52570	Include for each soil remediation process.
<input type="checkbox"/> Y <input type="checkbox"/> N	PI-22	Ethanol Plants (<i>Under Development</i>)	None	Include for each ethanol plant.

Part C: Control Equipment				
Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-01	Control Equipment Summary	51904	Include if add-on control equipment will be used for the process.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	CE-02	Particulates – Baghouse / Fabric Filter	51953	Include for each baghouse or fabric filter.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-03	Particulates – Cyclone	52620	Include for each cyclone.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-04	Particulates – Electrostatic Precipitator	52621	Include for each electrostatic precipitator.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-05	Particulates – Wet Collector / Scrubber / Absorber	52622	Include for each wet collector, scrubber, or absorber.
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	CE-06	Organics – Flare / Oxidizer / Incinerator	52623	Include for each flare, oxidizer, or incinerator.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-07	Organics – Adsorbers	52624	Include for each adsorber.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-08	Organics – Condenser	52625	Include for each condenser.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-09	Reduction Technology	52626	Include for each control device using reduction technology (e.g., SCR, SNCR).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	CE-10	Miscellaneous Control Equipment	52436	Include one form for equipment for which there is not a specific CE form.

Part B: Process Information				
Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	AEF-01	Alternate Emission Factor Request	51860	Submit if you are requesting to use an emission factor other than AP-42.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-01	Miscellaneous Processes	52534	Include one form for each process for which there is not a specific PI form.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02A	Combustion Unit Summary	52535	Include one form to summarize all combustion units (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02B	<i>Combustion: Boilers, Process Heaters, & Furnaces</i>	52536	Include one form for each boiler, process heater, or furnace (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02C	<i>Combustion: Turbines & Internal Combustion Engines</i>	52537	Include one form for each turbine or internal combustion engine (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02D	<i>Combustion: Incinerators & Combustors</i>	52538	Include one form for each incinerator or combustor (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02E	<i>Combustion: Kilns</i>	52539	Include one form for each kiln (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02F	<i>Combustion: Fuel Use</i>	52540	Include one form for each combustion unit (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02G	<i>Combustion: Emission Factors</i>	52541	Include one form for each combustion unit (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-02H	<i>Combustion: Federal Rule Applicability</i>	52542	Include one form for each combustion unit (<i>unless SSOA</i>).
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	PI-03	Storage and Handling of Bulk Material	52543	Include if the process involves the storage and handling of bulk materials.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-04	Asphalt Plants	52544	Include for each asphalt plant process (<i>unless general permit</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-05	Brick / Clay Products	52545	Include for each brick and/or clay products process.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-06	Electroplating Operations	52546	Include for each electroplating process.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-07	Welding Operations	52547	Include for each welding process.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-08	Concrete Batchers	52548	Include for each concrete batcher (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-09	Degreasing	52549	Include for each degreasing process (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-10	Dry Cleaners	52550	Include for each dry cleaning process
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-11	Foundry Operations	52551	Include for each foundry process
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-12	Grain Elevators	52552	Include for each grain elevator (<i>unless SSOA</i>).
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-13	Lime Manufacturing	52553	Include for each lime manufacturing process.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-14	Liquid Organic Compound Storage	52554 (doc)	Include if the process involves the storage of liquid organic compounds.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-14ALT	Alternate version of Liquid Organic Compound Storage	52555 (xls)	Include if the process involves the storage of liquid organic compounds and there are several storage vessels.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-15	Portland Cement Manufacturing	52556	Include for each Portland cement manufacturing process.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	PI-16	Reinforced Plastics & Composites	52557	Include for each reinforced plastics and composites process.

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OAQ GENERAL SOURCE DATA APPLICATION
GSD-01: Basic Source Level Information

State Form 50640 (R5 / 10)
 INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 State of Indiana

JUN 28 2024

JFJ

IDEM – Office of Air Quality – Permits Branch
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NOTES:

- The purpose of GSD-01 is to provide essential information about the entire source of air pollutant emissions. GSD-01 is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

169-48019-00068

PART A: Source / Company Location Information		
1. Source / Company Name: POET Biorefining - North Manchester, LLC		2. Plant ID: 169 – 00068
3. Location Address: 868 E 800 N		
City: North Manchester	State: IN	ZIP Code: 46962 –
4. County Name: Wabash		5. Township Name: Chester
6. Geographic Coordinates:		
Latitude: 40.946364		Longitude: -85.783219
7. Universal Transferal Mercadum Coordinates (if known):		
Zone: 16	Horizontal: 602417.13	Vertical: 4533515.79
8. Adjacent States: Is the source located within 50 miles of an adjacent state?		
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes – Indicate Adjacent State(s): <input type="checkbox"/> Illinois (IL) <input type="checkbox"/> Michigan (MI) <input type="checkbox"/> Ohio (OH) <input type="checkbox"/> Kentucky (KY)		
9. Attainment Area Designation: Is the source located within a non-attainment area for any of the criteria air pollutants?		
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes – Indicate Nonattainment Pollutant(s): <input type="checkbox"/> CO <input type="checkbox"/> Pb <input type="checkbox"/> NO _x <input type="checkbox"/> O ₃ <input type="checkbox"/> PM <input type="checkbox"/> PM ₁₀ <input type="checkbox"/> PM _{2.5} <input type="checkbox"/> SO ₂		
10. Portable / Stationary: Is this a portable or stationary source?		
		<input type="checkbox"/> Portable <input checked="" type="checkbox"/> Stationary

PART B: Source Summary	
11. Company Internet Address (optional): www.poet.com/northmanchester	
12. Company Name History: Has this source operated under any other name(s)?	
<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes – Provide information regarding past company names in Part I, Company Name History.	
13. Portable Source Location History: Will the location of the portable source be changing in the near future?	
<input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> No <input type="checkbox"/> Yes – Complete Part J, Portable Source Location History, and Part K, Request to Change Location of Portable Source.	
14. Existing Approvals: Have any exemptions, registrations, or permits been issued to this source?	
<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes – List these permits and their corresponding emissions units in Part M, Existing Approvals.	
15. Unpermitted Emissions Units: Does this source have any unpermitted emissions units?	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes – List all unpermitted emissions units in Part N, Unpermitted Emissions Units.	
16. New Source Review: Is this source proposing to construct or modify any emissions units?	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes – List all proposed new construction in Part O, New or Modified Emissions Units.	
17. Risk Management Plan: Has this source submitted a Risk Management Plan?	
<input checked="" type="checkbox"/> Not Required <input type="checkbox"/> No <input type="checkbox"/> Yes → Date submitted: EPA Facility Identifier: – –	

PART C: Source Contact Information

IDEM will send the original, signed permit decision to the person identified in this section. This person MUST be an employee of the permitted source.

18. Name of Source Contact Person: Ryan Lindeman

19. Title (optional): Environmental Health and Safety Specialist

20. Mailing Address: 868 E 800 N

City: North Manchester

State: IN

ZIP Code: 46962 –

21. Electronic Mail Address (optional): ryan.lindeman@poet.com

22. Telephone Number: (260) 774 – 9613

23. Facsimile Number (optional): () –

PART D: Authorized Individual/Responsible Official Information

IDEM will send a copy of the permit decision to the person indicated in this section, if the Authorized Individual or Responsible Official is different from the Source Contact specified in Part C.

24. Name of Authorized Individual or Responsible Official: David Pyle

25. Title: General Manager

26. Mailing Address: 868 E 800 N

City: North Manchester

State: IN

ZIP Code: 46962 –

27. Telephone Number: (260) 774 – 3532

28. Facsimile Number (optional): (260) 774 – 3530

29. Request to Change the Authorized Individual or Responsible Official: Is the source officially requesting to change the person designated as the Authorized Individual or Responsible Official in the official documents issued by IDEM, OAQ? The permit may list the title of the Authorized Individual or Responsible Official in lieu of a specific name.

No Yes – Change Responsible Official to:

PART E: Owner Information

30. Company Name of Owner: POET Biorefining - North Manchester, LLC

31. Name of Owner Contact Person: David Pyle

32. Mailing Address: 868 E 800 N

City: North Manchester

State: IN

ZIP Code: 46962 –

33. Telephone Number: (260) 774 – 3532

34. Facsimile Number (optional): (260) 774 – 3530

34. Operator: Does the "Owner" company also operate the source to which this application applies?

No – Proceed to Part F below. Yes – Enter "SAME AS OWNER" on line 35 and proceed to Part G below.

PART F: Operator Information

35. Company Name of Operator: SAME AS OWNER

36. Name of Operator Contact Person:

37. Mailing Address:

City:

State:

ZIP Code: –

38. Telephone Number: () –

39. Facsimile Number (optional): () –

PART G: Agent Information		
40. Company Name of Agent: Not Applicable		
41. Type of Agent: <input type="checkbox"/> Environmental Consultant <input type="checkbox"/> Attorney <input type="checkbox"/> Other (specify):		
42. Name of Agent Contact Person:		
43. Mailing Address:		
City:	State:	ZIP Code: -
44. Electronic Mail Address (optional):		
45. Telephone Number: () -		46. Facsimile Number (optional): () -
47. Request for Follow-up: Does the "Agent" wish to receive a copy of the preliminary findings during the public notice period (if applicable) and a copy of the final determination? <input type="checkbox"/> No <input type="checkbox"/> Yes		

PART H: Local Library Information		
48. Date application packet was filed with the local library: 6/25/2024		
49. Name of Library: North Manchester Public Library		
50. Name of Librarian (optional):		
51. Mailing Address: 405 North Market St		
City: North Manchester	State: IN	ZIP Code: 46962 -
52. Internet Address (optional): www.nman.lib.in.us		
53. Electronic Mail Address (optional):		
54. Telephone Number: (260) 982 - 4773		55. Facsimile Number (optional): () -

PART I: Company Name History (if applicable)	
Complete this section only if the source has previously operated under a legal name that is different from the name listed above in Section A.	
56. Legal Name of Company	57. Dates of Use
North Manchester Ethanol, LLC	8/30/2007 to 9/19/2008
	to
	to
	to
	to
	to
	to
	to
	to
	to
58. Company Name Change Request: Is the source officially requesting to change the legal name that will be printed on all official documents issued by IDEM, OAQ? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - Change Company Name to:	

PART L: Source Process Description

Complete this section to summarize the main processes at the source.

64. Process Description	65. Products	66. SIC Code	67. NAICS Code
Fuel Ethanol Production	Ethyl Alcohol	2869	325193
Prep feeds/feed ingredients	Other animal food manufacturing	2048	311119

PART M: Existing Approvals (if applicable)

Complete this section to summarize the approvals issued to the source since issuance of the main operating permit.

68. Permit ID	69. Emissions Unit IDs	70. Expiration Date
44369	Title V Operating Permit Renewal	4/25/2027

PART N: Unpermitted Emissions Units (if applicable)

Complete this section only if the source has emission units that are not listed in any permit issued by IDEM, OAQ.

71. Emissions Unit ID	72. Type of Emissions Unit	73. Actual Dates		
		Began Construction	Completed Construction	Began Operation

PART O: New or Modified Emissions Units (if applicable)

Complete this section only if the source is proposing to add new emission units or modify existing emission units.

74. Emissions Unit ID	75. NEW	76. MOD	77. Type of Emissions Unit	78. Estimated Dates		
				Begin Construction	Complete Construction	Begin Operation



OAQ GENERAL SOURCE DATA APPLICATION

GSD-02: Plant Layout Diagram

State Form 51605 (R3 / 1-10)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-02 is to provide a diagram of the entire plant site. This form and a Plant Layout diagram are required for all air permit applications. If you do not provide the necessary information, applicable to your source, the application process may be stopped.
- IDEM, OAQ has provided detailed instructions for this form and an example of a basic plant layout diagram on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Basic Plant Layout

Part A provides IDEM, OAQ with the appropriate information about all buildings and access-limiting features in and around the plant site. **Please use this table as a checklist.** You must provide scaled drawings, with the actual scale shown. All dimensions and units must be clearly indicated with a brief explanation of what is being shown. Include the following (*All measurements should be given in feet.*):

1. <input checked="" type="checkbox"/> Building Location and Dimensions		
2. <input checked="" type="checkbox"/> Property Lines and Access-Limiting Features		
3. <input checked="" type="checkbox"/> Surrounding Building Location and Dimensions		
4. <input checked="" type="checkbox"/> Distances to Property Lines and Access-Limiting Features		
5. <input type="checkbox"/> UTM Location Coordinates	6. <input type="checkbox"/> Compass (pointing North)	7. <input type="checkbox"/> Scale

Part B: Stack Information

Part B provides IDEM, OAQ with the appropriate information about all stacks, roof monitors, control devices, and process vents at the plant site. **Please use this table as a checklist.** You must show the location of all applicable emission points and include all relevant stack and emissions unit identification numbers for each. In addition, you will need to identify each of these emission points under "Stack Identification" on form GSD-04, Stack/Vent Information. Include the following (*All measurements should be in feet.*):

8. <input checked="" type="checkbox"/> Exhaust Stacks		
9. <input checked="" type="checkbox"/> Process Vents		
10. <input type="checkbox"/> Roof Monitors	<input checked="" type="checkbox"/> No Roof Monitors	
11. <input checked="" type="checkbox"/> Control Devices	<input type="checkbox"/> No Control Devices	
12. <input type="checkbox"/> Interior Vents	<input checked="" type="checkbox"/> No Interior Vents	<input type="checkbox"/> Doors and Windows (<i>for processes vented inside a building</i>)

Part C: Roadway Information

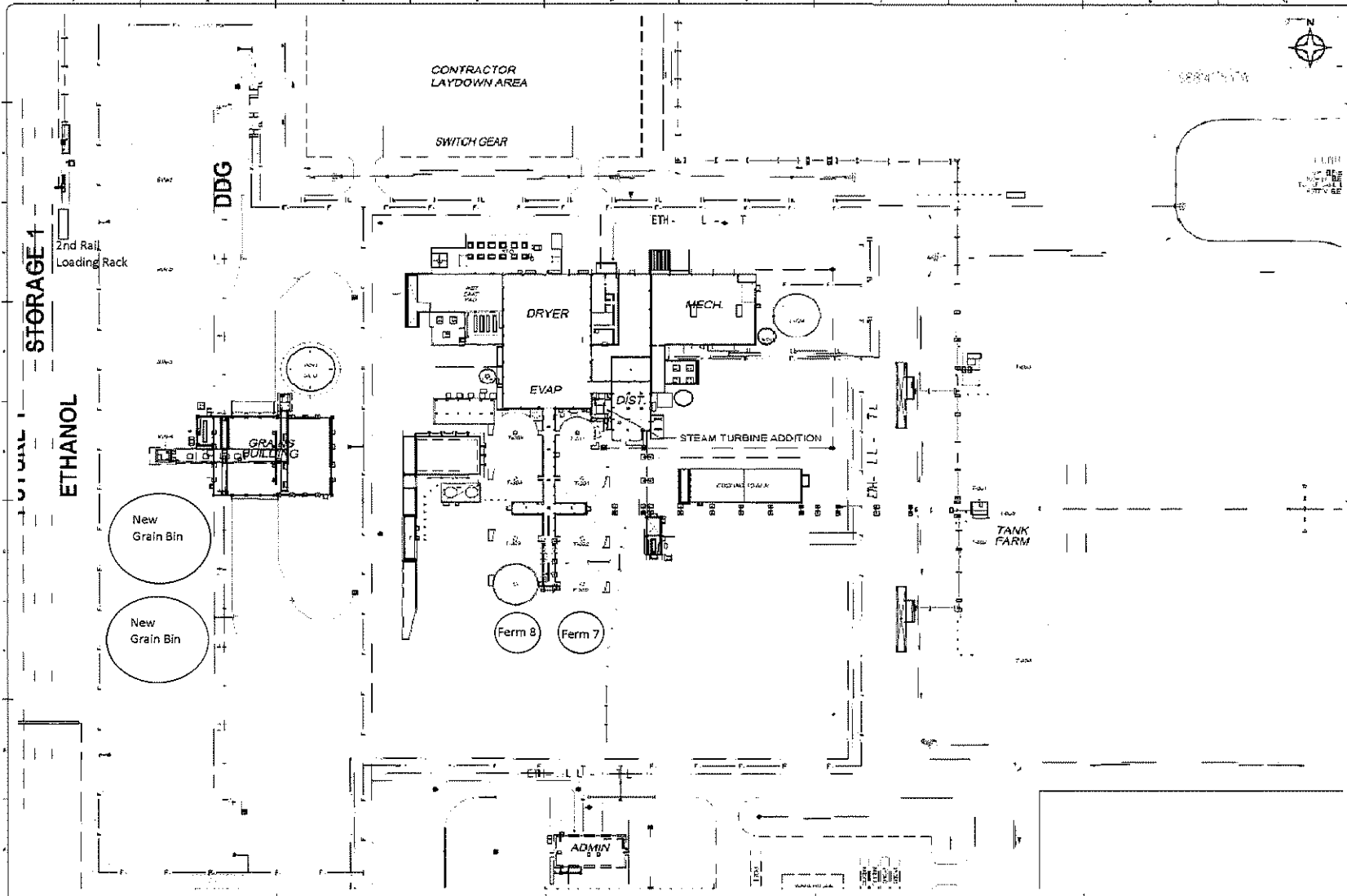
Part C provides IDEM, OAQ with the appropriate information about the roadways in and around the plant site. **Please use this table as a checklist.** Include the following (*All measurements should be in feet.*):

13. <input checked="" type="checkbox"/> Adjacent Roadways		<input checked="" type="checkbox"/> Interior Roadways
14. <input checked="" type="checkbox"/> Roadway Surface Description (gravel, dirt, paved, etc.)		
15. <input checked="" type="checkbox"/> Number of Lanes		

Part F: Plant Layout Diagram

This space provides a place for a hand drawn plant layout diagram. It is **optional** to use this space to create your plant layout, but you must include the diagram with your application. If you choose to submit the plant layout in a different format, state "plant layout attached" in the space provided, and submit the information with your completed application. IDEM, OAQ has provided an example of a basic plant layout diagram on the Air Permit Applications Forms website.

POET Biorefining - North Manchester, LLC
Plant Layout





OAQ GENERAL SOURCE DATA APPLICATION

GSD-03: Process Flow Diagram

State Form 51599 (R3 / 1-10)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-03 is to provide a checklist for identifying the information to be included on each Process Flow diagram.
- Complete this form and submit a process flow diagram for each process included in your air permit application.
- IDEM, OAQ has provided detailed instructions for this form and an example of a basic process flow diagram on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Process Flow Diagram

Part A provides basic information to understanding the nature of the process. Please use this table as a checklist to indicate that you have included the following items on your process flow diagram (*All throughputs should be given in pounds per hour.*):

- | |
|--|
| 1. <input checked="" type="checkbox"/> Process Description: Fuel Ethanol Production Facility |
| 2. <input checked="" type="checkbox"/> Process Equipment |
| 3. <input checked="" type="checkbox"/> Raw Material Input |
| 4. <input checked="" type="checkbox"/> Process Throughput |
| 5. <input type="checkbox"/> Additions <input type="checkbox"/> Deletions <input checked="" type="checkbox"/> Modifications |

Use the space below to briefly explain the impacts of the additional equipment, the reason for removing any equipment, and/or the reason for the proposed modification. (*If additional space is needed, please attach a separate sheet with the information and indicate in the space below that additional information is attached.*)

No additional equipment, modification is to add SOx emissions and limits to existing emission units.

Part B: Process Operation Schedule

Part B indicates the actual (or estimated actual) hours of operation for the process.

- | |
|---|
| 6. <input checked="" type="checkbox"/> Process Operation Schedule <u>24</u> Hours per Day <u>7</u> Days per Week <u>52</u> Weeks Per Year |
|---|

7. **Scheduled Downtime:** Use the space below to include as much information as is known about scheduled periods of downtime for this process. (*If additional space is needed, please attach a separate sheet with the information and indicate in the space below that additional information is attached.*)

Not Applicable

Part C: Emissions Point Information

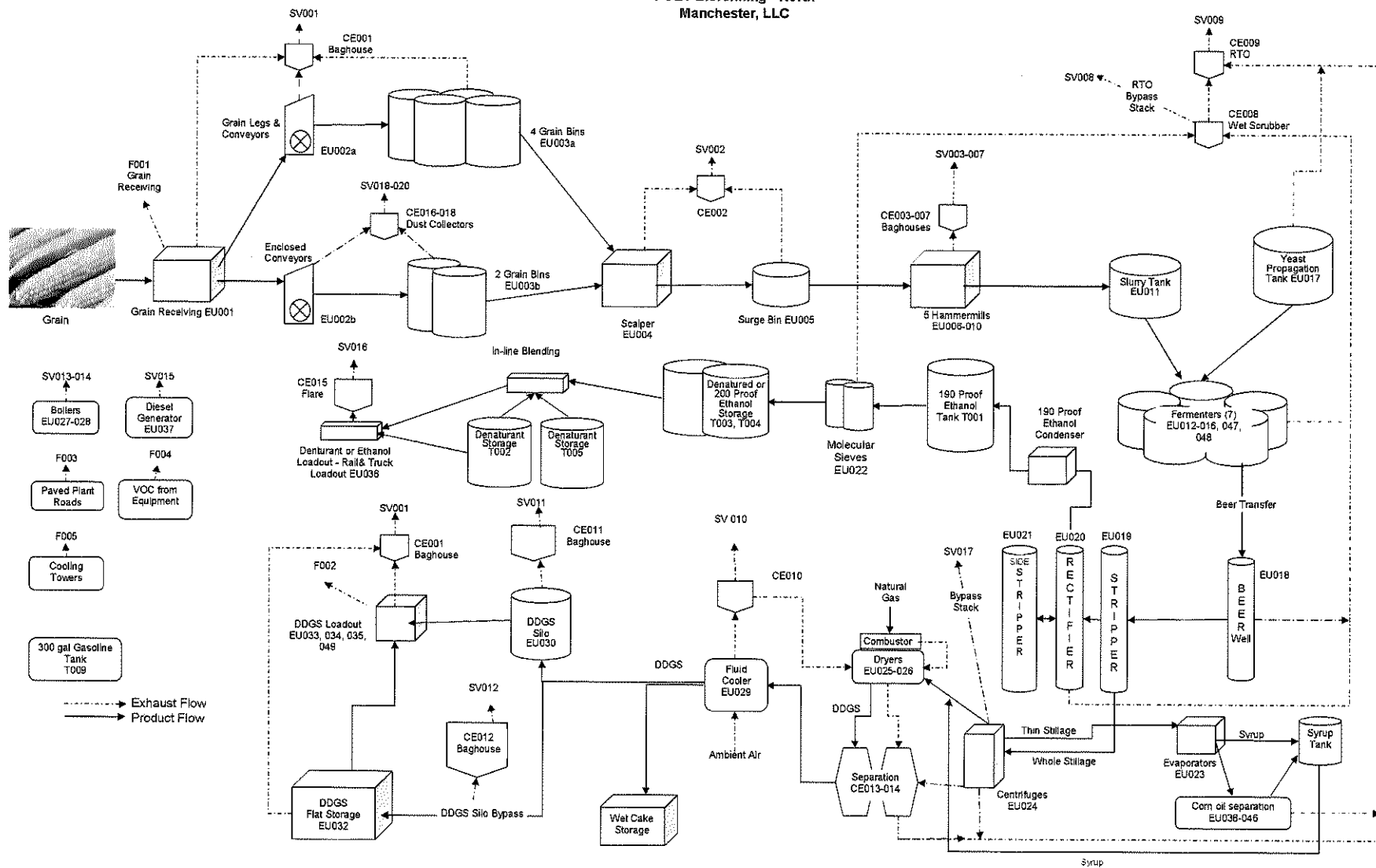
Part C provides information about each potential outlet of air pollutant emissions to the atmosphere. Please use this table as a checklist to indicate that you have included the following items on your process flow diagram (*All throughputs should be given in pounds per hour.*):

- | |
|---|
| 8. <input checked="" type="checkbox"/> Stack / Vent Information |
| 9. <input checked="" type="checkbox"/> Pollutants Emitted |
| 10. <input checked="" type="checkbox"/> Air Pollution Control |

Part D: Process Flow Diagram

This space provides a place for a hand drawn process flow diagram. It is **optional** to use this space to create your process flow diagram, but you must include the diagram with your application. If you choose to submit the process flow diagram in a different format, state "process flow diagram attached" in the space provided, and submit the information with your completed application. IDEM, OAQ has provided an example of a basic process flow diagram on the Air Permit Applications Forms website.

**GSD-03: Process Flow Diagram
POET Biorefining - North
Manchester, LLC**





OAQ GENERAL SOURCE DATA APPLICATION
GSD-05: Emissions Unit Information
 State Form 51610 (R3 / 1-10)
 INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide basic information about each emissions unit that has the potential to emit air pollutants. This form is required for all air permit applications.
- Detailed instructions for this form are available online on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Emissions Unit Information							
This table provides detailed information about each emissions unit that has the potential to emit air pollutants to the atmosphere. Accurate information is needed to determine the total potential to emit. If you do not provide enough information to adequately describe each emissions unit, the application process may be stopped. If additional space is needed, you may make a copy of this form.							
1. Unit ID	2. Model Number	3. Serial Number	4. Description	5. Manufacturer	6. Installation Date	7. Maximum Capacity	8. Stack / Vent ID
EU012	NA	NA	Fermenter #1	POET	6/1/2007	73000.00 gal/hr	SV008, SV009
EU013	NA	NA	Fermenter #2	POET	6/1/2007	73000.00 gal/hr	SV008, SV009
EU014	NA	NA	Fermenter #3	POET	6/1/2007	73000.00 gal/hr	SV008, SV009
EU015	NA	NA	Fermenter #4	POET	6/1/2007	73000.00 gal/hr	SV008, SV009
EU016	NA	NA	Fermenter #5	POET	6/1/2007	73000.00 gal/hr	SV008, SV009
EU017	NA	NA	YEAST PROPAGATION TANK	POET	6/1/2007	69000.00 gal/hr	SV008, SV009
EU018	NA	NA	BEER WELL	POET	6/1/2007	69000.00 gal/hr	SV008, SV009
EU0019	NA	NA	BEER STRIPPER	SIZER CHEMTECH	6/1/2007	69000.00 gal/hr	SV008, SV009
EU020	NA	NA	RECTIFIER		6/1/2007	69000.00 gal/hr	SV008, SV009
EU021	NA	NA	SIDE STRIPPER	SIZER CHEMTECH	6/1/2007	69000.00 gal/hr	SV008, SV009
EU022	NA	NA	ONE SET OF THREE MOLECULAR SIEVES	SIZER CHEMTECH	6/1/2007	69000.00 gal/hr	SV008, SV009
EU023	NA	NA	ONE SET OF FOUR EVAPORATORS	SIZER CHEMTECH	6/1/2007	69000.00 gal/hr	SV008, SV009
EU024	NA	NA	ONE SET OF FOUR CENTRIFUGES		6/1/2007	69000.00 gal/hr	SV008, SV009

EU025	NA	NA	DDG DRYER #1	BARR-ROSIN	6/1/2007	42.50 ton/hr	SV009
EU026	NA	NA	DDG DRYER #2	BARR-ROSIN	6/1/2007	42.50 ton/hr	SV009
EU047, EU049, EU051	NA	NA	Fermenter #6 & #7 & #8	POET	6/1/2007	73000.00 gal/hr	SV008, SV009

Part B: Pollutant Emissions Summary

Part B provides the total actual and potential emissions of each criteria pollutant emitted from the source (including all emissions units and fugitive emissions at the source). If you do not provide enough information to adequately describe the total source emissions, the application process may be stopped.

6. Criteria Pollutant	7. Actual Emissions		8. Potential To Emit	
	Standard Units	Tons Per Year	Standard Units	Tons Per Year
Carbon Monoxide (CO)	See attached PTE calculations			
Lead (Pb)				
Nitrogen Oxides (NO _x)				
Particulate Matter (PM)				
Particulate Matter less than 10µm (PM ₁₀)				
Particulate Matter less than 2.5µm (PM _{2.5})				
Sulfur Dioxide (SO ₂)				
Volatile Organic Compounds (VOC)				
Other (specify):				

Part C: Fugitive VOC Emissions (if applicable)

Part C summarizes the sources of fugitive VOC emissions at the source and estimates VOC emissions from these emission points. Complete this table if you are required to provide fugitive emissions data pursuant to 326 IAC 2-2 or 326 IAC 2-3.

9. Fugitive Emissions Source	10. Emission Factor (lb/hr)	11. Number Leaking	12. Uncontrolled Potential To Emit	
			Pounds Per Hour	Tons Per Year
Compressor Seals				
Flanges				
Open-Ended Lines				
Pressure Relief Seals				
Pump Seals				
Sampling Connections				
Valves				
Other (specify):				

Part B: Pollutant Emissions Summary

Part B provides the total actual and potential emissions of each hazardous air pollutant emitted from the source (including all emissions units and fugitive emissions at the source). If you do not provide enough information to adequately describe the total source emissions, the application process may be stopped.

7. Hazardous Air Pollutant	8. CAS Number	9. Actual Emissions		10. Potential To Emit	
		Standard Units	Tons Per Year	Standard Units	Tons Per Year
See attached PTE calculations					

Part C: Fugitive HAP Emissions (if applicable)

Part C summarizes the sources of fugitive HAP emissions at the source and estimates HAP emissions from these emission points. Complete this table if you are required to provide fugitive emissions data pursuant to 326 IAC 2-2 or 326 IAC 2-3.

11. Fugitive Emissions Source	12. Hazardous Air Pollutant	13. Emission Factor (lb/hr)	14. Number Leaking	15. Uncontrolled Potential To Emit	
				Pounds Per Hour	Tons Per Year
Compressor Seals	See attached PTE calculations				
Flanges					
Open-Ended Lines					
Pressure Relief Seals					
Pump Seals					
Sampling Connections					
Valves					
Other (specify):					



OAQ PROCESS INFORMATION APPLICATION

PI-03: Storage & Handling of Bulk Material

State Form 52543 (R2 / 1-10)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
 www.IN.gov/idem

NOTES:

- The purpose of this form is to obtain detailed information about the storage and handling of bulk materials. Complete one form for each process (or group of identical processes). Use additional forms if necessary. This is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Storage & Handling Information

Part A identifies all process units associated with storage and handling process for bulk materials. If there are multiple process units that are identical in nature, capacity, and use, you may use one form to summarize the data.

1. Equipment / Component Type	2. Unit ID	3. Number of Identical Units	4. Installation Date <i>(see instructions)</i>	5. Material Handled/ Stored	6. Maximum Materials Throughput Rate <i>(tons/year)</i>
DDG Fluid Bed Cooler	EU029		6/1/2007	DDGS	175200.00
DDG Silo Loading	EU030		6/1/2007	DDGS	175200.00
DDG Silo Bypass	EU031		6/1/2007	DDGS	175200.00

7. Add-On Control Technology: *Identify all control technologies used for this unit, and attach completed CE-01 (unless "none").*

- None
 Baghouse / Fabric Filter – *Attach CE-02.*
 Cyclone – *Attach CE-03.*
 Electrostatic Precipitator – *Attach CE-04.*
 Absorption / Wet Collector / Scrubber – *Attach CE-05.*
 Adsorber – *Attach CE-07.*
 Other (specify): _____ – *Attach CE-10.*

8. Control Techniques: *Identify any other air emission control options used for the process.*

Conveyors and transfer points will be aspirated to a fabric filter baghouse.

9. Process Limitations / Additional Information: *Identify any acceptable process limitations. Attach additional information if necessary.*

PART B: Process Material Information

Part B summarizes the process material information. Provide the information in the items below for each material stored and/or handled in this process.

10. Material Handled/Stored <i>(from table above)</i>	11. Method of Handling	12. Type of Storage	13. Storage Capacity <i>(tons)</i>	14. Pile Acreage	15. Silt Content <i>(% by weight)</i>	16. Moisture Content <i>(% by weight)</i>
DDG	Conveyor	Silo			0.00%	10.00%
DDG	Conveyor	Flat Building			0.00%	10.00%

PART C: Emission Factors

Part C identifies all emission factors used to calculate air emissions from the process units listed on this form.

17. Process Equipment & ID <i>(complete for all units listed in Part A of this form)</i>	18. Air Pollutant	19. Emission Factor		20. Source of Emission Factor <i>(if not using AP-42, include calculations)</i>
		value	units	
See attached	PM			<input type="checkbox"/> AP-42 <input checked="" type="checkbox"/> Other
See attached	PM-10			<input type="checkbox"/> AP-42 <input checked="" type="checkbox"/> Other
See PTE	SO2			<input type="checkbox"/> AP-42 <input checked="" type="checkbox"/> Other
				<input type="checkbox"/> AP-42 <input type="checkbox"/> Other

PART D: Federal Rule Applicability

Part D identifies any federal rules that apply to the process.

21. Is a New Source Performance Standard (NSPS) applicable to this source? Yes No
If yes, attach a completed FED-01 for each rule that applies.

<input type="checkbox"/> 40 CFR Part 60, Subpart CC	Glass Manufacturing Plants
<input type="checkbox"/> 40 CFR Part 60, Subpart DD	Grain Elevators
<input type="checkbox"/> 40 CFR Part 60, Subpart HH	Lime Manufacturing Plants
<input type="checkbox"/> 40 CFR Part 60, Subpart LL	Metallic Mineral Processing Plants
<input type="checkbox"/> 40 CFR Part 60, Subpart UU	Asphalt Processing and Asphalt Roofing Manufacture
<input type="checkbox"/> 40 CFR Part 60, Subpart OOO	Non-Metallic Mineral Processing Plants
<input type="checkbox"/> 40 CFR Part 60, Subpart UUU	Calciners and Dryers in Mineral Industries

22. Is a National Emission Standard for Hazardous Air Pollutants (NESHAP) applicable to this source? Yes No
If yes, attach a completed FED-01 for each rule that applies.

<input type="checkbox"/> 40 CFR Part 61, Subpart _____	<i>(Specify):</i>
<input type="checkbox"/> 40 CFR Part 63, Subpart _____	<i>(Specify):</i>

23. Non-Applicability Determination: Provide an explanation if the process unit appears subject to a rule (based on the rule title or the source category), but the rule will not apply.

Grain storage less than 2.5 million bu.



OAQ CONTROL EQUIPMENT APPLICATION
CE-02: Particulate Control – Baghouse / Fabric Filter

State Form 51953 (R2 / 1-10)
 INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/idem

- NOTES:
- The purpose of CE-02 is to identify all the parameters that describe the baghouse or fabric filter. This is a required form.
 - Complete this form once for each baghouse or fabric filter (or once for each set of identical baghouses or fabric filters).
 - Detailed instructions for this form are available on the Air Permit Application Forms website.
 - All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the particulate control device and describes its physical properties.

1. Control Equipment ID:	CE010
2. Installation Date:	6/1/2007
3. Bags or Cartridges?	<input checked="" type="checkbox"/> Bags <input type="checkbox"/> Cartridges
4. Filter Material:	Fabric
5. Number of Bags/Cartridges per Compartment:	
6. Number of Compartments:	
7. Mode of Operation:	<input type="checkbox"/> Intermittent <input type="checkbox"/> Periodic <input checked="" type="checkbox"/> Continuous
8. Cleaning Method:	<input type="checkbox"/> Shaking <input type="checkbox"/> Reverse Pulse <input type="checkbox"/> Reverse Air <input checked="" type="checkbox"/> Jet Pulse
9. Cleaning Cycle / Frequency (specify units):	
10. Is a bag leak detector installed on this device?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11. Type / Description of Bag Leak Detector:	<input type="checkbox"/> Positive Pressure <input type="checkbox"/> Negative Pressure
12. Air to Cloth Ratio (Ex: 1.3 : 1.0):	3.4 : 1.0
13. Is Lime Injection used on this device?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
14. Is Carbon Injection used on this device?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream. Appropriate units must be included if the standard units are not used. For each applicable parameter, provide the inlet and outlet values or provide the differential value.

	A. Units	B. Inlet	C. Outlet	D. Differential
15. Gas Stream Flow Rate	ACFM	23800.00	23800.00	0.00
16. Gas Stream Temperature	°F	70.00	70.00	0.00
17. Gas Stream Pressure	inches of water			to
18. Moisture Content	%			
19. Particle Size Range	micrometers			to
20. Lime Injection Rate (if applicable)	lb/hr			
21. Carbon Injection Rate (if applicable)	lb/hr			
22. Other (specify):				

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	23. Units	24. Inlet	25. Outlet	26. Efficiency (%):	
				Capture	Control
<input type="checkbox"/> a. Lead (Pb)					
<input type="checkbox"/> b. Hazardous Air Pollutant (HAP) (specify):					
<input type="checkbox"/> c. Particulate Matter (PM)					
<input type="checkbox"/> d. Particulate Matter less than 10µm (PM ₁₀)					
<input type="checkbox"/> e. Particulate Matter less than 2.5µm (PM _{2.5})					
<input checked="" type="checkbox"/> f. Other Pollutant (specify): SO ₂	lb/hr		1.00	0.00%	0.00%

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

27. Item(s) Monitored:	Visible Emissions		
28. Monitoring Frequency:	Daily		
29. Item(s) Recorded:	Visible Emissions		
30. Record Keeping Frequency:	Daily		
31. Pollutant(s) Tested:	Visible Emissions		
32. Test Method(s):	NA		
33. Testing Frequency:	NA		

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

34. Do you have a Preventive Maintenance Plan (PMP)?

No PMP is needed. Yes – the following items are identified on the PMP:

- A. Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.
- B. Description of the items or conditions that will be inspected.
- C. Schedule for inspection of items or conditions described above.
- D. Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

PART F: Determination of Integral Control

Part F provides explanation to determine whether the control device should be considered integral to the process.

35. Has IDEM already made an integral control determination for this device?

If "Yes", provide the following:

No Yes

Permit Number:

Issuance Date:

Determination: Integral Not Integral

36. Is this device integral to the process?

If "Yes", provide the reason(s) why the device is integral.

No Yes



OAQ CONTROL EQUIPMENT APPLICATION
CE-02: Particulate Control – Baghouse / Fabric Filter
 State Form 51953 (R2 / 1-10)
 INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/idem

- NOTES:
- The purpose of CE-02 is to identify all the parameters that describe the baghouse or fabric filter. This is a required form.
 - Complete this form once for each baghouse or fabric filter (or once for each set of identical baghouses or fabric filters).
 - Detailed instructions for this form are available on the Air Permit Application Forms website.
 - All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the particulate control device and describes its physical properties.

1. Control Equipment ID:	CE011, CE012
2. Installation Date:	6/1/2007
3. Bags or Cartridges?	<input checked="" type="checkbox"/> Bags <input type="checkbox"/> Cartridges
4. Filter Material:	Fabric
5. Number of Bags/Cartridges per Compartment:	
6. Number of Compartments:	
7. Mode of Operation:	<input type="checkbox"/> Intermittent <input type="checkbox"/> Periodic <input checked="" type="checkbox"/> Continuous
8. Cleaning Method:	<input type="checkbox"/> Shaking <input type="checkbox"/> Reverse Pulse <input type="checkbox"/> Reverse Air <input checked="" type="checkbox"/> Jet Pulse
9. Cleaning Cycle / Frequency (specify units):	
10. Is a bag leak detector installed on this device?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11. Type / Description of Bag Leak Detector:	<input type="checkbox"/> Positive Pressure <input type="checkbox"/> Negative Pressure
12. Air to Cloth Ratio (Ex: 1.3 : 1.0):	3.4 : 1.0
13. Is Lime Injection used on this device?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
14. Is Carbon Injection used on this device?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream. Appropriate units must be included if the standard units are not used. For each applicable parameter, provide the inlet and outlet values or provide the differential value.

	A. Units	B. Inlet	C. Outlet	D. Differential
15. Gas Stream Flow Rate	ACFM	4000.00	4000.00	0.00
16. Gas Stream Temperature	°F	70.00	70.00	0.00
17. Gas Stream Pressure	inches of water			to
18. Moisture Content	%			
19. Particle Size Range	micrometers			to
20. Lime Injection Rate (if applicable)	lb/hr			
21. Carbon Injection Rate (if applicable)	lb/hr			
22. Other (specify):				

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	23. Units	24. Inlet	25. Outlet	26. Efficiency (%):	
				Capture	Control
<input type="checkbox"/> a. Lead (Pb)					
<input type="checkbox"/> b. Hazardous Air Pollutant (HAP) (specify):					
<input type="checkbox"/> c. Particulate Matter (PM)					
<input type="checkbox"/> d. Particulate Matter less than 10µm (PM ₁₀)					
<input type="checkbox"/> e. Particulate Matter less than 2.5µm (PM _{2.5})					
<input checked="" type="checkbox"/> f. Other Pollutant (specify): SO ₂	lb/hr		0.50	0.00%	0.00%

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

27. Item(s) Monitored:		Visible Emissions		
28. Monitoring Frequency:		Daily		
29. Item(s) Recorded:		Visible Emissions		
30. Record Keeping Frequency:		Daily		
31. Pollutant(s) Tested:		Visible Emissions		
32. Test Method(s):		NA		
33. Testing Frequency:		NA		

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

34. Do you have a Preventive Maintenance Plan (PMP)?

No PMP is needed. Yes – the following items are identified on the PMP:

A. Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.

B. Description of the items or conditions that will be inspected.

C. Schedule for inspection of items or conditions described above.

D. Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

PART F: Determination of Integral Control

Part F provides explanation to determine whether the control device should be considered integral to the process.

35. Has IDEM already made an integral control determination for this device?

No Yes

If "Yes", provide the following:

Permit Number:

Issuance Date:

Determination: Integral Not Integral

36. Is this device integral to the process?

No Yes

If "Yes", provide the reason(s) why the device is integral.



OAQ CONTROL EQUIPMENT APPLICATION
CE-06: Organics – Flare / Oxidizer / Incinerator
 State Form 52623 (R / 1-10)
 INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
 www.IN.gov/idem

NOTES:

- The purpose of CE-06 is to identify all the parameters that describe the oxidizer or incinerator. This is a required form.
- Complete this form once for each oxidizer or incinerator (or once for each set of identical oxidizers or incinerators).
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the control device and describes its physical properties.

1. Control Equipment ID:	CE009		
2. Installation Date:	6/1/2007		
3. Incineration Method:	<input type="checkbox"/> Flare	<input type="checkbox"/> Thermal Oxidizer	<input type="checkbox"/> Catalytic Oxidizer <input checked="" type="checkbox"/> Other (specify): RTO
4. Residence Time (specify units):			
5. Hood Static Pressure (specify units):			Negative Pressure? <input type="checkbox"/> Yes <input type="checkbox"/> No
6. Bed Temperature at the Flame Zone:	°F		
7. Fuel Used:	<input type="checkbox"/> Not Applicable	<input checked="" type="checkbox"/> Natural Gas Only	<input type="checkbox"/> Other – Attach completed PI-02F form.
8. Is the Gas Stream used as Overfire Air?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes: Combustion Unit ID:		
9. Location of Flame (flares only):	<input type="checkbox"/> Ground Level <input type="checkbox"/> Other (specify elevation and units of measure):		
10. Are Flame Arrestors used? (flares only)	<input type="checkbox"/> No <input type="checkbox"/> Yes		
11. Are Steam Jets used? (flares only)	<input type="checkbox"/> No <input type="checkbox"/> Yes		
12. How is the flare used? (flares only)	<input type="checkbox"/> Emergency only <input type="checkbox"/> Normal Operation <input type="checkbox"/> Other (specify):		
13. Catalyst Material:	<input checked="" type="checkbox"/> None <input type="checkbox"/> Specify:		
14. Number of Catalyst Beds:	<input checked="" type="checkbox"/> Not Applicable		
15. Is the Catalyst Cleaned and reused on-site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable		
16. Is a Heat Exchanger used to recover heat on this device?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
17. Heat Exchanger Type:	<input type="checkbox"/> Recuperator	<input checked="" type="checkbox"/> Regenerator	<input type="checkbox"/> Other (specify): <input type="checkbox"/> Not Applicable

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream.

	A. Units	B. Inlet	C. Outlet	D. Differential
18. Organic Vapor Concentration (by volume)	ppmv			
19. Gas Stream Flow Rate	ACFM	145000.00	145000.00	
20. Moisture Content	%	43.00%	43.00%	
21. Heat Content (for Flares)	%			
22. Excess Oxygen (for Oxidizers)	%			
23. Particle Size Range	micrometers			to
24. Other (specify):				

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	25. Units	26. Inlet	27. Outlet	28. Efficiency (%):	
				Capture	Control
<input type="checkbox"/> a. Carbon Monoxide (CO)					
<input type="checkbox"/> b. Hazardous Air Pollutant (HAP) (specify):					
<input type="checkbox"/> c. Particulate Matter (PM)					
<input type="checkbox"/> d. Particulate Matter less than 10µm (PM ₁₀)					
<input type="checkbox"/> e. Particulate Matter less than 2.5µm (PM _{2.5})					
<input type="checkbox"/> f. Volatile Organic Compounds (VOC)					
<input checked="" type="checkbox"/> g. Other Pollutant (specify): SO ₂	lb/hr		TBD	0.00%	0.00%

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

29. Item(s) Monitored:	Combustion Chamber Temperature	Visible Emissions		
30. Monitoring Frequency:	Continuous	Daily		
31. Item(s) Recorded:	Combustion Chamber Temperature	Normal/Abnormal		
32. Record Keeping Frequency:	3 hr average	Daily		
33. Pollutant(s) Tested:	NA	NA		
34. Test Method(s):	NA	NA		
35. Testing Frequency:	NA	NA		

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

36. Do you have a Preventive Maintenance Plan (PMP)?

No PMP is needed. Yes – the following items are identified on the PMP:

A. Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.

B. Description of the items or conditions that will be inspected.

C. Schedule for inspection of items or conditions described above.

D. Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

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OAQ COMPLIANCE DETERMINATION APPLICATION

CD-01: Emissions Unit Compliance Status

State Form 51861 (R / 1-10)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/Idem

NOTES:

- The purpose of CD-01 is to identify the requirements that apply to each emissions unit at the permitted source and to determine the compliance status of these emissions units.
- This is required form for each initial Title V permit application as well as each modification and every renewal.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification of Source and Emissions Unit

Part A identifies the source and the emissions unit. For the purposes of this form, the term “source” refers to the plant site as a whole and NOT to individual emissions units.

1. Source Name: POET Biorefining - North Manchester	2. Source ID: 069 – 00068
3. Emissions Unit Description: Regenerative Thermal Oxidizer	4. Unit ID: SV009

PART B: Regulatory Compliance Status

Part B identifies the regulatory requirements that apply to the emissions unit and to determine the compliance status of the emissions unit. These “regulatory requirements” are those required by federal, state, or local law.

5. Rule Cite	6. Description	7. State / Local Only	8. Limitation	9. Test Method	10. In Compliance (y/n)
326 IAC 2-8-4	PM emission limit		33.1 lb/hr	1,2,3,4,5,202	Y
326 IAC 2-8-4	PM10 emission limit		33.1 lb/hr	1,2,3,4,5,202	Y
326 IAC 2-8-4	PM2.5 emission limit		33.1 lb/hr	1,2,3,4,5,202	Y
326 IAC 2-8-4	VOC emission limit		30.8 lb/hr	1,2,3,4,5,22/25A	Y
326 IAC 2-8-4	CO emission limit		41.95 lb/hr	1,2,3,4,10	Y
326 IAC 2-8-4	Acetaldehyde emission limit		1.27 lb/hr	1,2,3,4,5,18	Y
326 IAC 2-8-4	Methanol emission limit		1.0 lb.hr	1,2,3,4,5,18	Y
326 IAC 2-8-4	Fuel Ethanol BACT		98% control for VOC	1,2,3,4,18,25A	Y
326 IAC 2-8-4	SO2 emission limit		35.63 lb/hr		

PART C: Compliance Status – Other Requirements

Part C identifies any other requirements that apply to the emissions unit and to determine the compliance status of the emissions unit. These “other requirements” would not be required by federal, state, or local law.

11. Other Requirements	12. State / Local Only	13. In Compliance (y/n)
None		

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OAQ COMPLIANCE DETERMINATION APPLICATION
CD-03: Compliance Plan Requirements Per
Emissions Unit

State Form 51863 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CD-03 is to identify existing compliance monitoring activities (monitoring, testing, record keeping and/or reporting) required in an applicable requirement or to provide compliance monitoring activities for applicable requirements where there is no or inadequate compliance monitoring requirements.
- CD-03 focuses on specific applicable requirements that may apply to a single emission unit or group of emission units.
- This is required form for each initial Title V permit application as well as each modification and every renewal.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification of Source and Applicable Requirement	
Part A identifies the source and the emissions unit. Use one form for each emissions unit. For the purposes of this form, the term "source" refers to the plant site as a whole and NOT to individual emissions units.	
1. Source Name: POET Biorefining - North Manchester	2. Source ID: 063 – 00068
3. Emissions Unit Description: Regenerative Thermal Oxidizer	4. Unit ID: SV009
5. Limitations: List each operational and/or emission limit for this emissions unit.	
PM emission limit - 26.64 lbs/hr PM10 emission limit - 29.70 lbs/hr PM2.5 emission limit - 28.40 lbs/hr VOC emission limit -39.49 lbs/hr CO emission limit - 27.71 lbs/hr Acetaldehyde emission limit - 1.23 lbs/hr Methanol emission limit - 1.75 lbs/hr Acrolein emission limit - 1.00 lbs/hr Total HAPs emission limit - 2.6 lbs/hr Proposed SO2 emission limit - 35.63lb/hr	
6. Reporting Schedule: Provide a description of the reporting schedule to be used. The schedule should include what will be reported and how often the reports will be submitted.	
None	



OAQ COMPLIANCE DETERMINATION APPLICATION
CD-04: Compliance Schedule and Certification
 State Form 51864 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
 100 N. Senate Avenue, MC 61-53 Room 1003
 Indianapolis, IN 46204-2251
 Telephone: (317) 233-0178 or
 Toll Free: 1-800-451-6027 x30178 (within Indiana)
 Facsimile Number: (317) 232-6749
www.IN.gov/Idem

NOTES:

- The purpose of CD-04 is to provide a schedule of for compliance certification submittals, a certification of the source's compliance status with all applicable requirements, and a compliance schedule that details the measures a source will use to address non-compliance.
- Complete this form once per application (not once for each emissions unit) with respect to all applicable requirements at the source.
- This is required form for each initial Title V permit application as well as each modification and every renewal.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Source Identification and Compliance Schedule	
Part A identifies the permitted source and the permit term compliance certification schedule.	
1. Source Name: POET Biorefining - North Manchester, LLC	2. Source ID: 069 – 0068
3. Permit Term Compliance Certification Schedule	
Date of first certification submittal:	Frequency of future submittals:

PART B: Risk Management Plan		
Part B indicates whether sources subject to section 112(r), Accidental Release Prevention, are complying with the requirement to submit a Risk Management Plan (RMP).		
4. Statement of Applicability / Non-Applicability: Indicate whether the source is subject to Section 112(r) and the requirement to submit and RMP.		
<input type="checkbox"/> Source is subject to Section 112(r) and a Risk Management Plan (RMP) is required. <input checked="" type="checkbox"/> Source is not subject to Section 112(r) and a Risk Management Plan (RMP) is not required.		
RMP Submittal Information: Indicate when the RMP was submitted to each of the following agencies. If the RMP has not yet been submitted to any of the listed agencies, indicate the date when the RMP will be mailed to that agency. If the RMP for IDEM is attached to this application, please write "attached" in the Date Submitted column.		
5. Agency Name	6. Date Submitted	7. Expected Submittal Date
Chemical Safety and Hazard Investigation Board (CSHIB)		
United States Environmental Protection Agency (U.S. EPA)		
Indiana Department of Environmental Management (IDEM)		
Local Agency responsible for permitting:		
8. EPA Facility Identifier: — —		

PART C: Certification of Source Compliance Status

Part C states whether the source is or is not in full compliance with all applicable requirements and to identify corrective actions to be taken in cases of noncompliance.


9. Check the Most Accurate Statement.

- The source described in this air pollution control permit application is fully in compliance with all applicable requirements and will continue to comply with those requirements.
- FORM CD-01 includes new requirements that apply or will apply to the emissions unit during the term of the permit. The source will meet such requirements on a timely basis.
- The source described in this air pollution control permit application is fully in compliance with all applicable requirements, except for the emissions unit(s) listed below. Compliance will be achieved according to the schedule identified below.

10. Unit ID	11. Applicable Requirement	12. Corrective Action	13. Deadline	14. Progress Reports	
				Start Date	Frequency

15. Signature of Responsible Official

I certify that, based on information and belief formed after reasonable inquiry, the statements and information presented are true, accurate and complete.

David Pyle
Name (typed)

Signature

General Manager
Title
6/25/2024
Date

Attachment B: Emission Calculations
PTE Summary

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

Emission Point	Emission Unit Description	Uncontrolled Potential to Emit (tons/yr)						
		PM	PM10	PM2.5*	SO ₂	NO _x	VOC	CO
SV001	Grain Receiving (EU001), Conveyors (EU002), and Grain Storage Bins (EU003)	596.18	596.18	596.18	-	-	-	-
SV020	Belt Conveyor EU002b and Grain Bins EU003b	22.53	22.53	22.53	-	-	-	-
SV021		22.53	22.53	22.53	-	-	-	-
SV002	Corn Transfer Conveyor / Scalper (EU004, Surge Bin (EU005)	45.05	45.05	45.05	-	-	-	-
SV003	Hammermill #1 (EU006)	180.21	180.21	180.21	-	-	-	-
SV004	Hammermill #2 (EU007)	180.21	180.21	180.21	-	-	-	-
SV005	Hammermill #3 (EU008)	180.21	180.21	180.21	-	-	-	-
SV006	Hammermill #4 (EU009)	180.21	180.21	180.21	-	-	-	-
SV007	Hammermill #5 (EU010)	180.21	180.21	180.21	-	-	-	-
SV008***	Fermentation Scrubber / RTO Bypass (EU011-EU023)	-	-	-	-	-	5.855	-
SV009	Scrubber Bypass	82.81	82.81	82.81	0.39	90.18	8.516	63.85
SV009***	RTO Stack & DDGS Dryers (EU025 & EU026)	481.25	481.25	481.25	156.04	90.18	4.171	1100.48
EU024	Set of four (4) Centrifuges**	-	-	-	-	-	14.60	-
SV010	DDGS Fluid Bed Cooler (EU029)	357.41	357.41	357.41	3.68	-	14.85	-
SV011	DDGS Silo Loading (EU030)	60.07	60.07	60.07	2.19	-	1.18	-
SV012	DDGS Silo Bypass (EU031)	67.58	67.58	67.58	2.19	-	1.18	-
SV018	DDGS Loadout Operations (EU033, EU035)	150.17	150.17	150.17	-	-	7.04	-
SV016	Ethanol Loading Rack (EU036)	-	-	-	-	32.48	3.122	81.68
CE015	Enclosed Flare	4.41E-04	1.76E-03	1.76E-03	1.39E-04	0.02	1.28E-03	0.02
SV013 & SV014	Boiler #1 (EU027) & Boiler #2 (EU028)	2.33	9.33	9.33	0.74	36.84	6.75	24.56
T001 - T005, T009	Ethanol, Denaturant, and Gasoline Tanks	-	-	-	-	-	3.09	-
EU040 - EU046	Corn Oil / Defatted Syrup Tanks	-	-	-	-	-	0.01	-
EU038 & EU039	Corn Oil Centrifuges	-	-	-	-	-	0.01	-
EU0XX	Grain Loadout to Truck	21.50	7.25	1.23	-	-	-	-
SV015	Diesel Generator (EU037)	8.09	4.64	4.50	0.14	164.85	8.15	63.60
Total		2337.27	2326.57	2320.41	9.32	324.37	11695.12	233.71
Fugitive Emissions								
F001 & F002	Grain Receiving	40.97	11.85	2.00	-	-	-	-
F002	DDGS Loadout	0.53	0.13	0.13	-	-	1.18	-
F004	Fugitive Leaks	-	-	-	-	-	105.14	-
F005	Cooling Tower	8.22	8.22	8.22	-	-	-	-
F006	Rail Car Venting	-	-	-	-	-	0.65	-
F007	DDGS Storage Building	0.53	0.13	0.13	-	-	-	-
F008****	Wet Cake	-	-	-	-	-	2.84	-
F003	Paved Roads	16.29	3.26	0.80	-	-	-	-
Total Fugitive		66.54	23.58	11.28	0.00	0.00	109.80	0.00

* PM2.5 listed is direct PM2.5

**The centrifuges normally vent to the RTO and are included in the PTE for the RTO Stack; therefore, the uncontrolled centrifuge emissions are not included in the facility totals.

***SV008 and SV009 (RTO Stack and DDGS Dryers) emissions are included for reference, but are not included in the facility total emissions. SV009 and SV008 cover 3 operating scenarios, and it is not possible to operate all 3 scenarios at once. Emissions from SV009 (Bypass of Scrubber) is worst-case operating scenario for emissions of VOC and HAP; therefore, it is included in the facility total emissions.

****As both DDGS and wetcake cannot be produced, only fugitive emissions from DDGS handling is included in the total fugitive emissions.

EPA published a final rule in the Federal Register on May 1, 2007, that excluded ethanol production facilities that produce ethanol through natural fermentation, from the major source category "Chemical Process Plants". Therefore, the fugitive emissions from ethanol production facilities are not longer counted toward determination of PSD, Emission Offset, and Part 70 Permit applicability.

Attachment B: Emission Calculations
PTE Summary

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

Potential to Emit After Control (tons/yr)								
Emission Point	Emission Unit Description	PM	PM10	PM2.5 *	SO ₂	NO _x	VOC	CO
SV001	Grain Receiving (EU001), Conveyors (EU002), and Grain Storage Bins (EU003)	5.96	5.96	5.96	-	-	-	-
SV020	Belt Conveyor EU002b and Grain Bins EU003b	0.23	0.23	0.23				
SV021		0.23	0.23	0.23				
SV002	Corn Transfer Conveyor / Scalper (EU004, Surge Bin (EU005)	0.45	0.45	0.45	-	-	-	-
SV003	Hammermill #1 (EU006)	1.80	1.80	1.80	-	-	-	-
SV004	Hammermill #2 (EU007)	1.80	1.80	1.80	-	-	-	-
SV005	Hammermill #3 (EU008)	1.80	1.80	1.80	-	-	-	-
SV006	Hammermill #4 (EU009)	1.80	1.80	1.80	-	-	-	-
SV007	Hammermill #5 (EU010)	1.80	1.80	1.80	-	-	-	-
SV008***	Fermentation Scrubber / RTO Bypass (EU011-EU023)	-	-	-	-	-	117.11	-
SV009	Scrubber Bypass	82.81	82.81	82.81	0.39	90.18	170.32	63.85
SV009***	RTO Stack & DDGS Dryers (EU025 & EU026)	48.13	48.13	48.13	156.04	90.18	83.41	110.05
EU024	Set of four (4) Centrifuges**	-	-	-	-	-	-	-
SV010	DDGS Fluid Bed Cooler (EU029)	3.57	3.57	3.57	3.68	-	14.85	-
SV011	DDGS Silo Loading (EU030)	0.60	0.60	0.60	2.19	-	1.18	-
SV012	DDGS Silo Bypass (EU031)	0.68	0.68	0.68	2.19	-	1.18	-
SV018	DDGS Loadout Operations (EU033, EU035)	1.50	1.50	1.50	-	-	7.04	-
SV016	Ethanol Loading Rack (EU036)	-	-	-	-	32.48	62.45	81.68
CE015	Enclosed Flare	4.41E-04	1.76E-03	1.76E-03	1.39E-04	0.02	1.28E-03	0.02
SV013 & SV014	Boiler #1 (EU027) & Boiler #2 (EU028)	2.33	9.33	9.33	0.74	36.84	6.75	24.56
T001 - T005, T009	Ethanol, Denaturant, and Gasoline Tanks	-	-	-	-	-	3.09	-
EU040 - EU046	Corn Oil / Defatted Syrup Tanks	-	-	-	-	-	0.01	-
EU038 & EU039	Corn Oil Centrifuges	-	-	-	-	-	0.01	-
EU0XX	Grain Loadout to Truck	21.50	7.25	1.23	-	-	-	-
SV015	Diesel Generator (EU037)	8.09	4.64	4.50	0.14	164.85	8.15	63.60
Total		136.96	126.26	120.16	9.32	324.37	275.02	233.71

* PM2.5 listed is direct PM2.5

**The centrifuges are included in the RTO Stack emissions.

***SV008 and SV009 (RTO Stack and DDGS Dryers) emissions are included for reference, but are not included in the facility total emissions. SV009 and SV008 cover 3 operating scenarios, and it is not possible to operate all 3 scenarios at once. Emissions from SV009 (Bypass of Scrubber) is worst-case operating scenario for emissions of VOC and HAP; therefore, it is included in the facility total emissions.

**Attachment B: Emission Calculations
PTE Summary**

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:

Reviewer:

Potential to Emit After Issuance (tons/yr)								
Emission Point	Emission Unit Description	PM	PM10	PM2.5 *	SO ₂	NO _x	VOC	CO
SV001	Grain Receiving (EU001), Conveyors (EU002), and Grain Storage Bins (EU003)	23.96	25.23	25.23	-	-	-	-
SV020	Belt Conveyor EU002b and Grain Bins EU003b	0.23	0.23	0.23	-	-	-	-
SV021		0.23	0.23	0.23	-	-	-	-
SV002	Corn Transfer Conveyor / Scalper (EU004, Surge Bin (EU005)	1.75	1.84	1.84	-	-	-	-
SV003	Hammermill #1 (EU006)	7.23	7.62	7.62	-	-	-	-
SV004	Hammermill #2 (EU007)	7.23	7.62	7.62	-	-	-	-
SV005	Hammermill #3 (EU008)	7.23	7.62	7.62	-	-	-	-
SV006	Hammermill #4 (EU009)	7.23	7.62	7.62	-	-	-	-
SV007	Hammermill #5 (EU010)	7.23	7.62	7.62	-	-	-	-
SV008***	Fermentation Scrubber / RTO Bypass (EU011-EU023)	-	-	-	-	-	21.05	-
SV009***	Scrubber Bypass	116.68	130.09	124.39	156.04	90.18	172.97	121.37
SV009***	RTO Stack & DDGS Dryers (EU025 & EU026)	116.68	130.09	124.39	156.04	90.18	172.97	121.37
EU024	Set of four (4) Centrifuges**	-	-	-	-	-	0.83	-
SV010	DDGS Fluid Bed Cooler (EU029)	0.08	0.08	0.08	4.38	-	24.90	-
SV011	DDGS Silo Loading (EU030)	2.45	2.58	2.58	2.19	-	1.18	-
SV012	DDGS Silo Bypass (EU031)	2.63	2.76	2.76	2.19	-	1.18	-
SV018	DDGS Loadout Operations (EU033, EU035)	6.00	6.31	6.31	-	-	7.04	-
SV016	Ethanol Loading Rack (EU036)	-	-	-	-	2.08	7.34	5.22
CE015	Enclosed Flare	4.41E-04	1.76E-03	1.76E-03	1.39E-04	0.02	1.28E-03	0.02
SV013 & SV014	Boiler #1 (EU027) & Boiler #2 (EU028)	2.33	9.33	9.33	0.74	36.84	6.75	24.56
T001 - T005, T009	Ethanol, Denaturant, and Gasoline Tanks	-	-	-	-	-	3.09	-
EU040 - EU046	Corn Oil / Defatted Syrup Tanks	-	-	-	-	-	0.01	-
EU038 & EU039	Corn Oil Centrifuges	-	-	-	-	-	8.10E-03	-
EU0XX	Grain Loadout to Truck	21.50	7.25	1.23	-	-	-	-
SV015	Diesel Generator (EU037)	0.46	0.26	0.26	0.01	9.41	0.47	3.63
	Total	214.45	224.30	212.58	165.54	138.53	236.95	154.80

* PM2.5 listed is direct PM2.5

**The centrifuges are normally controlled by the RTO. Emissions are included in the RTO Stack. During RTO downtime, emissions are uncontrolled and shown here.

***SV008 and the two SV009 lines represent 3 operating scenarios involving the scrubber and the RTO. For purposes of worst-case total facility VOC emissions, it was assumed that SV008 would operate at the permit limit of 500 hours a year and that SV009 (scrubber bypass) would be the operating scenario for the remaining 8260 hours of the year.

Note: The shaded cells indicate where limits are included.

Potential to Emit After Issuance Nested Source (tons/yr)								
Emission Point	Emission Unit Description	PM	PM10	PM2.5 *	SO ₂	NO _x	VOC	CO
SV013 & SV014	Boiler #1 (EU027) & Boiler #2 (EU028)	2.33	9.33	9.33	0.74	36.84	6.75	24.56
	Total	2.33	9.33	9.33	0.74	36.84	6.75	24.56

* PM2.5 listed is direct PM2.5

Attachment B: Emission Calculations
HAPs Summary

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46822
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

HAP Pollutant	CAS	Scrubber/ RTO Bypass (lb/yr)	Scrubber RTO Stack Processing (ton/yr)	Centrifuges (ton/yr)	DDES Cooler (ton/yr)	MS Boilers (ton/yr)	Leakout (ton/yr)	Flare Pilot, Flare Leaks (ton/yr)	Equipment Leaks (ton/yr)	Dissol Generator Venting (ton/yr)	Rearr Venting (ton/yr)	DDES Storage Silo (ton/yr)	DDES Silo Bypass (ton/yr)	DDES Conveyor and Rail Loading (ton/yr)	DDES Storage Building (ton/yr)	DDES Storage Spout (ton/yr)	DDES Storage Building (ton/yr)	Wet Cake* (ton/yr)	Total (ton/yr)
Organic HAP																			
Acetaldehyde	75-07-0	75.89	121.92	135.27	1.23	1.89	0.45	-	2.98E-03	2.04E-03	2.46E-04	9.80E-02	9.80E-02	9.87E-01	0.10	0.10	2.82E-04	3.42E-02	202.25
Acrolein	107-02-8	3.60	32.85	39.93	0.09	0.35	-	-	6.38E-04	6.38E-04	-	8.90E-02	8.90E-02	5.33E-01	0.09	0.09	-	6.03E-03	37.69
Benzene	71-43-2	-	-	1.86E-01	-	2.59E-03	35.99	4.97E-07	1.98E-03	8.29E-02	7.14E-05	4.07E-02	4.07E-02	-	-	-	9.25E-03	-	38.05
Carbon Disulfide	-	-	-	1.86E-01	-	0.09	-	-	-	-	-	4.07E-02	4.07E-02	-	-	-	-	-	0.16
Catbony Sulfide	-	-	-	1.86E-01	-	0.07	-	-	-	-	-	3.42E-02	3.42E-02	-	-	-	-	-	0.14
Cumene	98-95-8	-	-	-	-	-	15.19	-	0.00E+00	-	-	-	-	-	-	-	1.72E-03	-	15.19
Dibenzofurans	105-46-7	-	-	-	-	-	30.37	2.26E-07	0.00E+00	-	-	-	-	-	-	-	-	-	1.47E-03
Ethylbenzene	100-41-4	-	-	-	-	-	30.37	1.74E-05	0.00E+00	-	-	1.80E-02	1.80E-02	1.08E-01	0.02	0.02	-	-	26.53
Formaldehyde	50-00-0	0.22	25.55	25.55	0.02	0.18	238.13	4.71E-04	1.98E-01	6.38E-03	-	1.80E-02	1.80E-02	1.08E-01	-	-	-	6.83E-02	240.55
Hexane	110-84-3	-	-	1.16	-	2.21	0.22	-	1.49E-03	-	0.01	1.10E-01	1.10E-01	6.59E-01	0.11	0.11	-	0.55	240.55
Methanol	67-56-1	0.11	251.85	253.07	0.03	0.97	0.22	-	1.49E-03	-	1.23E-04	1.10E-01	1.10E-01	6.59E-01	0.11	0.11	-	1.41E-04	254.17
Naphthalene	91-20-3	-	-	3.95E-04	-	-	227.78	7.89E-07	0.00E+00	2.27E-02	-	-	-	-	-	-	-	2.59E-02	227.81
Toluene	108-88-3	-	-	2.19E-03	-	-	227.78	-	0.00E+00	1.56E-02	-	-	-	-	-	-	-	2.59E-02	227.81
Xylenes	1330-20-7	-	-	-	-	-	227.78	-	0.00E+00	1.56E-02	-	-	-	-	-	-	-	2.59E-02	227.81
Inorganic HAP																			
Arsenic	7440-38-2	-	-	1.26E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00
Beryllium	7440-41-7	-	-	7.73E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00
Cadmium	7440-43-7	-	-	7.09E-04	-	1.35E-03	-	2.65E-07	-	-	-	-	-	-	-	-	-	-	1.35E-03
Chromium	7440-47-3	-	-	9.02E-04	-	1.72E-03	-	3.25E-07	-	-	-	-	-	-	-	-	-	-	1.72E-03
Cobalt	7440-48-4	-	-	5.41E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00
Lead	TRN N420	-	-	3.22E-04	-	6.14E-04	-	1.15E-07	-	-	-	-	-	-	-	-	-	-	6.14E-04
Manganese	7439-96-5	-	-	2.48E-04	-	4.87E-04	-	8.81E-08	-	-	-	-	-	-	-	-	-	-	4.87E-04
Mercury	7439-97-6	-	-	1.57E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00
Nickel	7440-02-0	-	-	1.35E-03	-	2.56E-03	-	4.87E-07	-	-	-	-	-	-	-	-	-	-	2.56E-03
Selenium	7782-49-2	-	-	1.55E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00
Combined HAPs		79.80	432.17	455.27	1.36	3.55	775.91	4.38E-04	0.20	1.27E-01	9.33E-03	3.80E-01	3.80E-01	1.80E+00	3.15E-01	3.15E-01	6.11E-01	1.23E-01	1274.89

Attachment B : Emission Calculations
HAP's Summary

Company Name: POET Biorefining - North Manchester, LLC
Address City / IN ZIP: 888 East 800 North, North Manchester, Indiana 46942
Significant Source Modification No.:
Significant Permit Modification No. (Ref. to Record):

HAP Pollutant	CAS	Scrubber/ RTO Bypass (ton/yr)	Scrubber Bypass (ton/yr)	RTO Stack Processing (ton/yr)	Centrifuge (ton/yr)	DGGS Center (ton/yr)	NG Boilers (ton/yr)	Loadout (ton/yr)	Flare Pilot Flame (ton/yr)	Equipment Leaks (ton/yr)	Diesel Generator (ton/yr)	Railcar Venting (ton/yr)	DGGS Storage Silo (ton/yr)	DGGS Silo Bypass (ton/yr)	DGGS Conveyor and Rail Loading (ton/yr)	DGGS Loadout Spout (ton/yr)	DGGS Storage Building (ton/yr)	Tanks 901-001, 009 (ton/yr)	Wet Cake (ton/yr)	Total (ton/yr)	
																					Controlled Potential to Emit (ton/yr)
Organic HAP																					
Acetaldehyde	75-07-0	37.94	3.56	4.03	-	1.89	-	0.01	-	2.99E-03	2.04E-03	2.46E-04	0.10	0.10	0.10	0.10	0.10	2.82E-04	3.42E-02	44.38	
Acrolein	107-02-6	1.80	0.99	1.17	-	0.36	-	-	-	6.98E-04	6.98E-04	7.14E-05	0.09	0.09	0.09	0.09	-	-	6.83E-03	3.91	
Benzene	71-43-2	-	-	3.02E-04	-	2.58E-03	-	0.72	4.87E-07	1.58E-03	6.28E-02	7.14E-05	-	-	-	-	-	8.25E-03	-	0.79	
Carbon Disulfide	1865-01	-	-	1.86E-01	-	0.08	-	-	-	-	-	-	4.07E-02	4.07E-02	-	-	-	-	-	0.14	
Carbonyl Sulfide	1205-01	-	-	1.02E-01	-	0.07	-	0.30	-	0.00	-	-	3.42E-02	3.42E-02	-	-	-	1.72E-03	-	0.30	
Cumene	98-82-8	-	-	-	-	-	-	-	2.78E-07	-	-	-	-	-	-	-	-	-	-	-	
Dichlorobenzene	105-46-7	-	-	-	-	-	-	0.61	-	0.00E+00	-	-	-	-	-	-	-	3.45E-03	-	1.47E-03	
Ethylbenzene	100-41-4	-	-	-	-	-	-	0.18	1.74E-05	-	6.95E-03	-	0.02	0.02	0.02	0.02	-	-	6.83E-02	6.07E-01	
Formaldehyde	50-00-0	0.11	0.77	0.77	-	0.18	0.09	4.76	4.17E-04	0.20	-	0.01	-	-	-	-	-	0.55	-	7.18	
Hexane	110-54-3	-	-	0.26	-	2.21	-	0.00	-	1.45E-03	-	1.23E-04	0.11	0.11	0.11	0.11	0.11	1.41E-04	1.37E-02	9.57	
Methanol	67-58-1	0.06	7.68	7.59	-	0.97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Naphthalene	91-20-3	-	-	6.80E-06	-	-	-	4.56	7.88E-07	0.00	2.27E-02	-	-	-	-	-	-	0.00E+00	-	4.59	
Toluene	108-88-3	-	-	4.91E-04	-	-	4.18E-03	4.56	-	0.00E+00	1.55E-02	-	-	-	-	-	-	0.00E+00	-	4.57	
Xylenes	1330-20-1	-	-	-	-	-	-	4.56	-	-	-	-	-	-	-	-	-	-	-	-	
Inorganic HAP																					
Arsenic	7440-38-2	-	-	1.29E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00	
Beryllium	7440-11-7	-	-	7.73E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00	
Cadmium	7440-43-7	-	-	7.05E-04	-	1.35E-03	-	-	2.55E-07	-	-	-	-	-	-	-	-	-	-	0.00E+00	
Chromium	7440-17-3	-	-	9.02E-04	-	1.72E-03	-	-	3.29E-07	-	-	-	-	-	-	-	-	-	-	1.35E-03	
Cobalt	7440-48-4	-	-	5.41E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.72E-03	
Lead	TRI IN-20	-	-	3.22E-04	-	5.14E-04	-	-	1.15E-07	-	-	-	-	-	-	-	-	-	-	0.00E+00	
Manganese	7439-96-6	-	-	2.45E-04	-	4.67E-04	-	-	8.81E-08	-	-	-	-	-	-	-	-	-	-	6.14E-04	
Mercury	7439-97-6	-	-	1.87E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.07E-04	
Nickel	7440-02-0	-	-	1.95E-03	-	2.58E-03	-	-	4.87E-07	-	-	-	-	-	-	-	-	-	-	0.00E+00	
Selenium	7782-49-2	-	-	1.55E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.58E-03	
Combined HAP's		39.90	12.97	14.17	-	9.55	2.32	15.52	4.28E-04	0.20	1.27E-01	9.33E-03	3.40E-01	3.90E-01	1.89E+00	3.15E-01	3.15E-01	5.59E-01	1.23E-01	77.70	

Attachment B: Emission Calculations
HAP's Summary

Company Name: POET Biorefining - North Manchester, LLC
Address City, IN ZIP: 868 East 901 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviser:

HAP Pollutant	CAS	Scrubber/ RTO Bypass (ton/Yr)	Scrubber Bypass (ton/Yr)	RTO Stack - Processing (ton/Yr)	Centrifuges (ton/Yr)	DDGS Cooler (ton/Yr)	NG Boilers (ton/Yr)	Loadout (ton/Yr)	Flare Pilot Flame (ton/Yr)	Equipment Leaks (ton/Yr)	Diesel Generator (ton/Yr)	Raikar Venting (ton/Yr)	DDGS Storage Silo (ton/Yr)	DDGS Silo Bypass (ton/Yr)	DDGS Conveyor and Rail Loading (ton/Yr)	DDGS Loadout Spout (ton/Yr)	DDGS Storage Building (ton/Yr)	Tankage-005, 009 (ton/Yr)	Wet Cake** (ton/Yr)	Total (ton/Yr)															
																					Potential To Emit After Issuance (ton/Yr)														
Organic HAP																																			
Acetaldehyde	75-07-0	2.17	5.33	5.39	0.07	1.89	-	6.10E-04	-	2.89E-03	1.15E-04	2.46E-04	0.10	0.10	0.10	0.10	0.10	2.82E-04	3.42E-02	9.60															
Acrolein	107-02-8	0.13	4.38	4.38	4.56E-03	0.36	-	-	-	-	3.94E-05	-	0.09	0.09	-	0.09	-	-	6.83E-03	4.98															
Benzene	71-43-2	-	-	3.03E-04	-	-	2.58E-03	2.49	4.87E-07	1.69E-03	3.69E-03	7.14E-05	-	-	-	-	-	8.23E-03	-	2.49															
Carbon Disulfide	-	-	-	1.85E-01	-	0.08	-	-	-	-	-	-	4.07E-02	4.07E-02	-	-	-	-	-	0.16															
Carbonyl Sulfide	-	-	-	1.93E-01	-	0.07	-	2.49	-	0.00E+00	-	-	3.42E-02	3.42E-02	-	-	-	1.72E-03	-	2.49															
Cumene	98-52-8	-	-	-	-	-	1.47E-03	-	2.78E-07	-	-	-	-	-	-	-	-	-	-	1.47E-03															
Dichlorobenzene	105-46-7	-	-	-	-	-	-	2.49	-	0.00E+00	-	-	-	-	-	-	-	-	3.45E-03	2.49E+00															
Ethylbenzene	102-41-4	-	-	-	-	-	-	2.49	-	0.00E+00	-	-	-	-	-	-	-	-	-	2.49E+00															
Formaldehyde	50-00-0	0.13	0.77	0.77	8.68E-04	0.19	0.09	1.74E-05	1.74E-05	0.20	3.85E-04	0.01	0.02	0.02	0.02	0.02	0.02	0.02	6.63E-02	1.18															
Hexane	110-54-3	-	-	0.26	-	-	2.21	2.49	4.17E-04	0.20	-	1.23E-04	-	-	-	-	-	-	0.55	4.90															
Methanol	67-56-1	0.13	7.87	7.87	1.74E-03	0.97	-	3.05E-04	-	1.45E-03	-	1.23E-04	0.11	0.11	0.11	0.11	0.11	1.41E-04	1.37E-02	8.76															
Naphthalene	91-20-3	-	-	8.60E-05	-	-	-	-	-	-	9.79E-04	-	-	-	-	-	-	-	-	9.79E-04															
Toluene	108-88-3	-	-	4.91E-04	-	-	4.18E-03	2.49	7.88E-07	0.00E+00	1.90E-03	-	-	-	-	-	-	0.00E+00	-	2.49															
Xylenes	1339-20-7	-	-	-	-	-	-	2.49	-	0.00E+00	8.92E-04	-	-	-	-	-	-	0.00E+00	-	2.49E+00															
Inorganic HAP																																			
Arsenic	7440-39-2	-	-	1.39E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00															
Beryllium	7440-41-7	-	-	7.73E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00															
Cadmium	7440-43-7	-	-	7.95E-04	-	-	1.35E-03	-	2.55E-07	-	-	-	-	-	-	-	-	-	-	1.35E-03															
Chromium	7440-47-3	-	-	9.02E-04	-	-	1.72E-03	-	3.25E-07	-	-	-	-	-	-	-	-	-	-	1.72E-03															
Cobalt	7440-48-4	-	-	5.41E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00															
Lead	TRI N420	-	-	3.22E-04	-	-	6.14E-04	-	1.16E-07	-	-	-	-	-	-	-	-	-	-	6.14E-04															
Manganese	7439-96-6	-	-	2.65E-04	-	-	4.87E-04	-	8.81E-08	-	-	-	-	-	-	-	-	-	-	4.87E-04															
Mercury	7439-97-6	-	-	1.97E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00															
Nickel	7440-02-0	-	-	1.35E-03	-	-	2.58E-03	-	4.87E-07	-	-	-	-	-	-	-	-	-	-	2.58E-03															
Selenium	7782-49-2	-	-	1.55E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00															
Combined HAP's																																			
2.64		11.39		11.39		0.88		3.40		2.32		2.49		4.38E-04		0.20		0.01		9.23E-03		3.90E-01		3.90E-01		2.97E-01		3.15E-01		5.59E-01		1.22E-01		26.04	

*The centrifuges are included in the RTO Stack emissions
**Wet cake HAP emissions are included for reference on this page. As wet cake and DDGS cannot both be produced, only the HAP emissions from DDGS handling are included in the facility totals.
Note: The shaded cells indicate where HAPs are included

**Attachment B: Emission Calculations
Project Parameters**

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

Receiving	Current	Proposed	Difference
Annual Grain Receiving	41,071,429	41,071,429	0 bushel/yr
Denaturant Delivery (actual):	9,324,324	9,324,324	0 gal/yr
Grain Receiving Capacity	30,000	30,000	0 bushel/hr
Grain Receiving Capacity	840	840	0 ton/hr
Annual Grain Receiving	1,160,000	1,150,000	0 ton/yr
Annual Grain Loaded Out	0	500,000	500,000 ton/yr
Grain Density:	56	56	0 lb/bushel
Gallons Ethanol Produced per Bushel of Corn:	2.80	2.80	0 gal/bu
Production	Current		
Total Production in Gallons Anhydrous Ethanol Produced per Year:	116,000,000	115,000,000	0 gal/yr
<u>E-85 Operation (assume 10% of Anhydrous Ethanol Production is loaded out at E70):</u>			
Gallons E-85 Produced:	12,432,432	12,432,432	0 gal/yr
Denaturant Throughput:	3,729,730	3,729,730	0 gal/yr
Gallons Anhydrous Ethanol Loaded out in E-85 Service:	8,702,703	8,702,703	0 gal/yr
<u>Normal Denatured Ethanol Operation:</u>			
Gallons Denatured Ethanol Produced:	111,891,892	111,891,892	0 gal/yr
Denaturant Throughput:	5,594,595	5,594,595	0 gal/yr
Gallons Anhydrous Ethanol Loaded out in Denatured Service:	106,297,297	106,297,297	0 gal/yr
Undenatured Ethanol Production Rate	115,000,000	115,000,000	0 gal/yr
Combined Denatured Ethanol and E85 Production Rate	124,324,324	124,324,324	0 gal/yr
<u>Dry Distillers Grain with Solubles (DDGS) Production</u>			
	Current		
Hourly DDGS Production	36.76	36.76	0 ton/hr
Annual DDGS Production	322,000	322,000	0 ton/yr
Percent Grain Throughput that becomes DDGS	28.0%	28.0%	
Current			
DDGS Haul Out	12,880	12,880	0 truck/yr
Ethanol Haul Out	15,541	15,541	0 truck/yr
Denaturant Delivery	1,166	1,166	0 truck/yr
Grain Delivery	46,000	46,000	0 truck/yr
Tons Hauled per Truck	25	25	0 ton/truck
Gallons Hauled per Truck	8,000	8,000	0 gal/truck
Storage Tanks			
	Current		
190 or 200 Proof Ethanol Shift Tank (T001)	115,000,000	115,000,000	gal/yr
Denaturant Storage Tank (T002)	6,184,879	6,184,879 (5)	gal/yr
200 Proof Ethanol Storage Tank (T003)	115,000,000	115,000,000	gal/yr
200 Proof Ethanol Storage Tank (T004)	115,000,000	115,000,000	gal/yr
Denaturant Storage Tank (T005)	3,139,445	3,139,445 (5)	gal/yr

- (1a) Proposed Permit Limit
 (1b) Existing Permit Limit
 (2) Assume 10% of combined production is E-85.
 (3) E-85 can be blended anywhere between 70% to 83% undenatured ethanol, depending on atmospheric conditions.
 Assume denaturant is 30% of E-85 product.
 (4) Assume denaturant is 5% of denatured alcohol product.
 (5) Assumed worst case scenario of denaturant throughput divided through tanks T002 and T005 based on tank capacities

**Attachment B: Emission Calculations
VOC and HAP Emissions from the DDGS Handling Operations**

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46902
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

1. VOC, HAP, SO2 Stack Test Results from POET Facilities

Test Results	Run 1	Run 2	Run 3	Average
	lb/hr	lb/hr	lb/hr	lb/hr
Total VOC	0.25	0.26	0.25	0.253
Acetaldehyde	0.025	0.042	0.031	0.033
Acrolein	0.031	0.029	0.029	0.030
Methanol	0.032	0.039	0.039	0.037
Formaldehyde	0.006	0.006	0.006	0.006
Total HAP				0.105

VOC test data from stack test at POET's Gowrie facility on November 9, 2017. HAP test data from stack test at POET's Coming facility on October 25, 2017.

Process Rates =	Run 1	Run 2	Run 3	Average
	ton/hr	ton/hr	ton/hr	ton/hr
VOC Testing	104	104	104	104
HAP Testing	161	161	161	161

Marion Engineering Test - 07/12/2018 SV011 (DDGS Storage Silo)	
7/10/2018	
lb/hr	
Hydrogen Sulfide	0.0046
Carbonyl Sulfide*	0.0026
Carbon Disulfide*	0.0031
*Hazardous Air Pollutant	

2. Potential to Emit - Captured VOC Emissions
Safety Factor for VOC Emissions:

3

VOC Emissions - Uncontrolled

Stack Vent	Process Description	Hourly Throughput (ton/hr)	Annual Throughput (ton/year)	Uncontrolled VOC (lb/hr)	Uncontrolled VOC (ton/year)
SV011	DDGS Storage Silo #1	36.76	322,000	0.27	1.18
SV012	DDGS Silo Bypass #1	36.76	322,000	0.27	1.18
SV018	DDGS Loadout Conveyor and Railcar/Truck Loadout (EU033, EU035)	220.00	1,927,200	1.61	7.04
Total					9.39

VOC Emissions - Controlled

Stack Vent	Process Description	Hourly Throughput (ton/hr)	Annual Throughput (ton/year)	Uncontrolled VOC (lb/hr)	Uncontrolled VOC (ton/year)
SV011	DDGS Storage Silo #1	36.76	322,000	0.27	1.18
SV012	DDGS Silo Bypass #1	36.76	322,000	0.27	1.18
SV018	DDGS Loadout Conveyor and Railcar/Truck Loadout (EU033, EU035)	220.00	1,927,200	1.61	7.04
Total					9.39

* Baghouse provides no control for VOC; therefore controlled emissions = uncontrolled emissions

Methodology

Uncontrolled PTE (lb/hr) = stack test result (lb/hr) / tested throughput (ton/hr) x proposed throughput (ton/hr) x safety factor
Uncontrolled PTE (tons/yr) = Uncontrolled PTE (lb/hr) x 8760 hours/yr / 2000 lbs/ton
Controlled PTE (tons/yr) = Uncontrolled PTE (tons/yr); baghouse provides no control for VOC or HAP emissions

3. Potential to Emit - Captured HAP Emissions
Safety Factor for HAP Emissions:

3

HAP Emissions - Uncontrolled

Stack Vent	SV011		SV012		SV018		Total	
	DDGS Storage Silo #1		DDGS Silo Bypass #1		DDGS Loadout Conveyor and Railcar/Truck Loadout (EU033, EU035)			
Hourly Throughput (ton/hr)	37		37		220			
Annual Throughput (ton/year)	322,000		322,000		1,927,200			
Emissions	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Acetaldehyde	0.02	0.10	0.02	0.10	0.13	0.59	0.18	0.78
Acrolein	0.02	0.09	0.02	0.09	0.12	0.53	0.16	0.71
Methanol	0.03	0.11	0.03	0.11	0.15	0.66	0.20	0.89
Formaldehyde	0.00	0.02	0.00	0.02	0.02	0.11	0.03	0.14
Carbonyl Sulfide	0.01	0.03	0.01	0.03			0.02	0.07
Carbon Disulfide	0.01	0.04	0.01	0.04			0.02	0.08
Total HAP	0.09	0.39	0.09	0.39	0.43	1.89	0.61	2.67

Attachment B: Emission Calculations
VOC and HAP Emissions from the DDGS Handling Operations

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 888 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

HAP Emissions - Controlled

Stack Vent	SV011		SV012		SV018		Total	
	DDGS Storage Silo #1		DDGS Silo Bypass #1		DDGS Loadout Conveyor and Railcar/Truck Loadout (EU033, EU035)			
Hourly Throughput (ton/hr)	37		37		220			
Annual Throughput (ton/year)	322,000		322,000		1,927,200			
Emissions	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Acetaldehyde	0.02	0.10	0.02	0.10	0.13	0.59	0.18	0.78
Acrolein	0.02	0.09	0.02	0.09	0.12	0.53	0.16	0.71
Methanol	0.03	0.11	0.03	0.11	0.15	0.68	0.20	0.88
Formaldehyde	0.00	0.02	0.00	0.02	0.02	0.11	0.03	0.14
Carbonyl Sulfide	0.01	0.03	0.01	0.03			0.02	0.07
Carbon Disulfide	0.01	0.04	0.01	0.04			0.02	0.08
Total HAP	0.09	0.39	0.09	0.39	0.43	1.89	0.61	2.67

* Baghouse provides no control for HAP; therefore controlled emissions = uncontrolled emissions

HAP Emissions - Limited

Stack Vent	SV011		SV012		SV018		Total	
	DDGS Storage Silo #1		DDGS Silo Bypass #1		DDGS Loadout Conveyor and Railcar/Truck Loadout (EU033, EU035)			
Hourly Throughput (ton/hr)	37		37		220			
Annual Throughput (ton/year)	322,000		322,000		322,000			
Emissions	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Acetaldehyde	0.02	0.10	0.02	0.10	0.13	0.10	0.18	0.29
Acrolein	0.02	0.09	0.02	0.09	0.12	0.09	0.16	0.27
Methanol	0.03	0.11	0.03	0.11	0.15	0.11	0.20	0.33
Formaldehyde	0.00	0.02	0.00	0.02	0.02	0.02	0.03	0.05
Carbonyl Sulfide	0.01	0.03	0.01	0.03			0.02	0.07
Carbon Disulfide	0.01	0.04	0.01	0.04			0.02	0.08
Total HAP	0.07	0.32	0.07	0.32	0.43	0.32	0.57	0.95

4. Potential to Emit - SO2

SO2 Emissions

Stack Vent	Process Description	Uncontrolled Potential to Emit		Controlled Potential to Emit		Limited Potential to Emit	
		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year
SV011	DDGS Storage Silo #1	0.50	2.19	0.50	2.19	0.50	2.19
SV012	DDGS Silo Bypass #1	0.50	2.19	0.50	2.19	0.50	2.19

Baghouse provides no control for SO2; therefore controlled emissions = uncontrolled emissions
 SO2 emissions are assumed to be half of the emission rate for the fluid bed

4. Potential to Emit - Fugitive Emissions

Stack Vent	Process Description	Annual Throughput (ton/year)	VOC Emissions (ton/year)	Acetaldehyde Emissions (ton/year)	Acrolein Emissions (ton/year)	Methanol Emissions (ton/year)	Formaldehyde Emissions (ton/year)	Total HAP Emissions (ton/year)
F002	DDGS Loadout Spout (EU034, EU051)	322,000	1.18	0.10	0.09	0.11	0.02	0.32
F007	DDGS Storage Building	322,000	1.18	0.10	0.09	0.11	0.02	0.32

Attachment B: Emission Calculations
VOC and HAP Emissions
From the Distillation and Fermentation Scrubber / RTO Bypass (Stack SV008)

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

1. Process Description:

The RTO must occasionally be temporarily shut down for unscheduled maintenance or other operational reasons. In this event, the DDGS dryers will be shut down, however, the fermentation tanks and distillation systems will continue to be operated in normal mode. The emissions from these sources will be vented to the scrubber stack (RTO by-pass stack) SV008. The emissions will be controlled by the wet scrubber, CE008.

2. VOC and Acetaldehyde Stack Test Results from 2013 Stack Test

Test Results	Run 1	Run 2	Run 3	Average
	lb/hr	lb/hr	lb/hr	lb/hr
Total VOC	15.42	11.95	10.73	12.70
Acetaldehyde	2.200	1.720	1.200	1.71

Process Rate	Run 1	Run 2	Run 3	Average
	gpm	gpm	gpm	gpm
Bearfeed	855	855	855	855

HAP Stack Test Results from Scrubber from Alexandria Stack Test

Test Results	Run 1	Run 2	Run 3	Average
	lb/hr	lb/hr	lb/hr	lb/hr
Total VOC	15.59	14.56	14.78	14.98
Acetaldehyde	3.60	3.33	3.41	3.45
Acrolein	0.16	0.16	0.17	0.16
Formaldehyde	0.01	0.01	0.01	0.01
Methanol	0.005	0.005	0.005	0.01

Process Rate	Run 1	Run 2	Run 3	Average
	gpm	gpm	gpm	gpm
Bearfeed	955.159	954.896	954.931	955

3. Potential to Emit (PTE) of VOC and HAP from the scrubber:

Scrubber VOC Control Efficiency = 98.0%
 Scrubber HAP Control Efficiency = 50.0%
 Yearly operation limit = 500 hours
 Bearfeed Rate = 72,000 gal/hr
 VOC Safety Factor = 1.5
 HAP Safety Factor = 2.0

PTE Before Control	@ 500 hrs		@ 8760 hrs	
	lb/hr	ton/yr	lb/hr	ton/yr
VOC	1336.84	334.21	5.855	
Acetaldehyde	17.32	4.33	75.88	
Formaldehyde	0.05	0.01	0.22	
Methanol	0.03	0.01	0.11	
Acrolein	0.82	0.21	3.60	
Total Uncontrolled HAP	18.22	4.55	79.80	

PTE After Control (500 hrs)	@ 500 hrs		@ 8760 hrs	
	lb/hr	ton/yr	lb/hr	ton/yr
VOC	26.74	6.68	117.11	
Acetaldehyde	8.66	2.17	37.94	
Formaldehyde	0.03	0.01	0.11	
Methanol	0.01	3.14E-03	0.06	
Acrolein	0.41	0.10	1.80	
Total Controlled HAP	9.11	2.28	39.90	

Limited PTE	lb/hr	ton/yr	
VOC	84.21	21.05	
Acetaldehyde	8.66	2.17	UPDATED PERMIT LIMIT
Formaldehyde*	0.5	0.13	
Methanol*	0.5	0.13	
Acrolein*	0.5	0.13	
Total Limited HAP	10.16	2.54	UPDATED PERMIT LIMIT

*The emission rates used to calculate limited PTE for formaldehyde, methanol, and acrolein are based on scaled stack test data plus an additional safety factor; these emission rates are not limits in the current permit.

Methodology:

PTE Before Control (lb/hr) = PTE After Control (lb/hr) / 100% - Control Efficiency)

PTE Before Control (ton/yr) = PTE Before Control x hours / 2,000 lbs

PTE After Control (lbs/hr) = stack test result (lb/hr) / tested throughput (ton/hr) x proposed throughput (ton/hr) x safety factor

Limited PTE (lb/hr) = lb/hr emission rate in current permit or requested permit limit

Limited (ton/yr) = Limited PTE (lb/hr) x 500 hours / 2,000 lbs

Attachment B: Emission Calculations
PM, PM10, NOx, SOx, VOC, CO and HAP Emissions
 From the RTO controlling the Fermenters, Distillation System, and DDGS Dryers while Scrubber is bypassed

Company Name: **POET Biorefining - North Manchester, LLC**
 Address City IN Zip: **858 East 800 North, North Manchester, Indiana 46962**
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

1. Process Description:

The Scrubber must occasionally be temporarily shut down for unscheduled maintenance or other operational reasons. In this event, the fermentation tanks and distillation systems will continue to be operated in normal mode. The emissions from these sources will bypass the scrubber (CE008) and will be controlled by the RTO only (CE009).

2. Potential to Emit (PTE) from fermentation, distillation and dryers:

RTO VOC Control Efficiency =	98.00%
RTO HAP Control Efficiency =	97.00%
RTO NOx Control Efficiency =	0.00%
RTO CO Control Efficiency =	0.00%
RTO PM Control Efficiency =	0.00%
RTO SO2 Control Efficiency =	0.00%
Proposed Beerfeed =	72,000 gph
Criteria Pollutant Safety Factor =	1.25
HAP Safety Factor =	1.5

Natural Gas Combustion

Each dryer has a 60 MMBtu/hr natural gas fired burner. The dryers do not have the capacity to combust any other fuel. The dryers are connected in series, therefore, all of the DDGS is processed by each dryer.
 The RTO is equipped with five natural gas fired burners rated at 6 MMBtu/hr each for a total of 30 MMBtu/hr. The RTO is not equipped with burners to combust any other fuel.

Unit	Rated Capacity
DDGS Dryer EU025	60 MMBTU/hr
DDGS Dryer EU026	60 MMBTU/hr
RTO	30 MMBTU/hr

Pollutant	Emission Factor	
	lb/MMBTU	Source
SO2	0.0006	AP-42 Section 1.4
NOx	0.1373	AP-42 Section 1.4

North Manchester Stack Test - 2/28/2017

Test Results	Run 1	Run 2	Run 3	Average
	lb/hr	lb/hr	lb/hr	lb/hr
CO	3.36	14.26	10.37	9.33
VOC	24.97	23.06	26.63	24.89
PM	11.75	10.56	13.99	12.10
Acetaldehyde*	0.23	0.23	0.23	0.23
Formaldehyde	0.09	0.08	0.11	0.09
Methanol	1.02	0.77	0.97	0.92
Acrolein	0.12	0.12	0.12	0.12
Total HAP	1.46	1.21	1.42	1.36
Process Rate	Run 1	Run 2	Run 3	Average
Beerfeed	960	960	960	960

North Manchester Stack Test - 9/23/2013

Test Results	Run 1	Run 2	Run 3	Average
	lb/hr	lb/hr	lb/hr	lb/hr
Acetaldehyde*	0.42	0.54	0.23	0.40
Process Rate	Run 1	Run 2	Run 3	Average
Beerfeed	855	855	855	855

*Acetaldehyde results during the 2013 stack testing were higher than during 2017 stack testing; therefore, the 2013 results are used for potential-to-emit calculations. The total HAPs emission rates specified below represent the sum of 2017 formaldehyde, methanol, and acrolein results with 2013 acetaldehyde results.

	Uncontrolled Potential to Emit		Controlled Potential to Emit		Limited Potential to Emit	
	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY
VOC	1944.27	8515.91	38.88	170.32	39.49	172.97
HAPs	98.67	432.17	2.98	12.67	2.80	11.39
NOx	20.59	90.18	20.59	90.18	20.59	90.18
CO	14.58	63.85	14.58	63.85	27.71	121.37
PM	18.91	82.81	18.91	82.81	29.64	118.88
PM10	18.91	82.81	18.91	82.81	29.70	130.09
PM2.5	18.91	82.81	18.91	82.81	28.40	124.39
SO2	0.09	0.39	0.09	0.39	35.63	156.04
Acetaldehyde	27.84	121.92	0.84	3.66	1.23	5.39
Acrolein	7.50	32.85	0.23	0.99	1.00	4.38
Methanol	57.50	251.85	1.73	7.66	1.75	7.67
Formaldehyde	5.83	25.55	0.18	0.77	0.18	0.77

Methodology:

PTE Before Control (lb/hr) = PTE After Control (lb/hr) / 100% - Control Efficiency
 PTE Before Control (ton/yr) = PTE Before Control x 8760 hours / 2,000 lbs
 PTE After Control (lbs/hr) = stack test result (lb/hr) / tested throughput (ton/hr) x proposed throughput (ton/hr) x safety factor
 Limited PTE (lb/hr) = lb/hr emission rate in current permit or requested permit limits
 Limited (ton/yr) = Limited PTE (lb/hr) x 8760 hours / 2,000 lbs

Attachment B: Emission Calculations
PM, PM10, NOx, SOx, VOC, CO and HAP Emissions
From the RTO controlling the Fermenters, Distillation System, and DDGS Dryers

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

1. Process Description:

Emission point SV009 includes the emissions from the fermentation system, the distillation system, and the DDGS dryers. The fermentation system and distillation system vent to a scrubber which then exhausts into the regenerative thermal oxidizer (RTO). The DDGS dryers vent directly to the RTO. The RTO exhausts through stack SV009. The RTO is scheduled to operate 8760 hr/yr, however by permit it is allowed to be by-passed up to 500 hr/yr.

2. Potential to Emit (PTE) from fermentation, distillation and dryers:

RTO VOC Control Efficiency = 98.00%
 RTO HAP Control Efficiency = 97.00%
 RTO NOx Control Efficiency = 0.00%
 RTO CO Control Efficiency = 90.00%
 RTO PM Control Efficiency* = 90.00%
 RTO SO2 Control Efficiency = 0.00%
 Proposed Beerfeed = 72,000 gph
 Criteria Pollutant Safety Factor = 1.5
 HAP Safety Factor = 2
 *PM Control efficiency includes removal provided by the multicyclones.

Natural Gas Combustion

Each dryer has a 60 MMBtu/hr natural gas fired burner. The dryers do not have the capacity to combust any other fuel. The dryers are connected in series, therefore, all of the DDGS is processed by each dryer.

The RTO is equipped with five natural gas fired burners rated at 6 MMBtu/hr each for a total of 30 MMBtu/hr. The RTO is not equipped with burners to combust any other fuel.

Unit	Rated Capacity
DDGS Dryer EU025	60 MMBTU/Hr
DDGS Dryer EU026	60 MMBTU/Hr
RTO	30 MMBTU/Hr

Pollutant	Emission Factor	
	lb/MMBTU	Source
SO2	0.0006	AP-42 Section 1.4
NOx	0.1373	AP-42 Section 1.4

North Manchester Stack Test - 2/28/2017

Test Results	Run 1	Run 2	Run 3	Average
	lb/hr	lb/hr	lb/hr	lb/hr
CO	12.37	13.09	14.74	13.40
VOC	8.77	10.77	10.93	10.16
PM	9.9	3.3	4.38	5.86
Acetaldehyde	0.24	0.25	0.25	0.25
Formaldehyde	0.06	0.07	0.06	0.06
Methanol	0.52	0.74	0.82	0.69
Acrolein	0.09	0.11	0.12	0.11
Total HAP	0.91	1.16	1.25	1.11
Process Rate	Run 1	Run 2	Run 3	Average
	gpm	gpm	gpm	gpm
Beerfeed	960	960	960	960

Attachment B: Emission Calculations
PM, PM10, NOx, SOx, VOC, CO and HAP Emissions
From the RTO controlling the Fermenters, Distillation System, and DDGS Dryers

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:

North Manchester Stack Test - 2/28/2013

Test Results	Run 1	Run 2	Run 3	Run 4	Average
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Acetaldehyde*	0.27	0.37	0.23	0.46	0.33
Process Rate	Run 1	Run 2	Run 3	Run 3	Average
	gpm	gpm	gpm	gpm	gpm
Beerfeed	855	855	855	855	855

*Acetaldehyde results during the 2013 stack testing were higher than during 2017 stack testing; therefore, the 2013 results are used for potential-to-emit calculations.

POET Marion Engineering Test - 04/22/2024 - 04/25/2024 - SV009 (RTO)

	4/22/2024	4/25/2024	4/25/2024	4/25/2024	Average
	15:10 - 16:10	15:30-16:30	16:30-17:30	17:30-18:30	
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SO2	19.2	26.3	24.8	24.7	23.8

POET Marion Engineering Test - 07/10/2018 - 7/11/2018 - SV009 (RTO)

	7/10/2018	7/11/2018	Average
	lb/hr	lb/hr	lb/hr
Hydrogen Sulfide	0.0158	0.0252	0.021
Carbonyl Sulfide*	0.0136	0.0177	0.016
Carbon Disulfide*	0.0181	0.0384	0.028

*Hazardous Air Pollutant

The 2024 and 2018 engineering tests were completed with the processing aid online

	Uncontrolled Potential to Emit		Controlled Potential to Emit		Limited Potential to Emit		
	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	
VOC	952.19	4170.58	19.04	83.41	39.49	172.97	PERMIT LIMIT
HAPs	105.81	463.43	3.17	13.90	2.60	11.39	UPDATED PERMIT LIMIT
NOx	20.59	90.18	20.59	90.18	20.59	90.18	
CO	251.25	1100.48	25.13	110.05	27.71	121.37	PERMIT LIMIT
PM	109.88	481.25	10.99	48.13	26.64	116.68	PERMIT LIMIT
PM10	109.88	481.25	10.99	48.13	29.70	130.09	PERMIT LIMIT
PM2.5	109.88	481.25	10.99	48.13	28.40	124.39	PERMIT LIMIT
SO2	35.63	156.04	35.63	156.04	35.63	156.04	
Acetaldehyde	31.11	136.27	0.93	4.09	1.23	5.39	PERMIT LIMIT
Acrolein	8.89	38.93	0.27	1.17	1.00	4.38	PERMIT LIMIT
Methanol	57.78	253.07	1.73	7.59	1.75	7.67	PERMIT LIMIT
Formaldehyde	5.83	25.55	0.18	0.77	0.18	0.77	
Carbonyl Sulfide	0.02	0.10	0.02	0.10	0.02	0.10	
Carbon Disulfide	0.04	0.19	0.04	0.19	0.04	0.19	

Methodology:

PTE Before Control (lb/hr) = PTE After Control (lb/hr) / 100% - Control Efficiency)

PTE Before Control (ton/yr) = PTE Before Control x 8760 hours / 2,000 lbs

PTE After Control (lbs/hr) = stack test result (lb/hr) / tested throughput (ton/hr) x proposed throughput (ton/hr) x safety factor

Limited PTE (lb/hr) = lb/hr emission rate in current permit and requested permit limits

Limited (ton/yr) = Limited PTE (lb/hr) x 8760 hours / 2,000 lbs

**Attachment B: Emission Calculations
HAP Combustion Emissions from the Dryers and RTO**

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

1. Process Description:

POET Biorefining - North Manchester operates two DDGS dryers. Each dryer is 60 MMBtu/hr and be fired on natural gas. There is no back-up fuel. The dryer exhaust is directed to the RTO at all times the dryers are operating. The RTO has an estimated organic HAP control efficiency of 97%.

2. Potential to Emit (PTE) Combustion HAPs from the dryers:

HAP Pollutant	Emission Factor ¹ (lb/MMSCF)	Potential to Emit Emissions (Uncontrolled)		Potential to Emit Emissions (Controlled)	
		(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Benzene	2.10E-03	2.47E-04	1.08E-03	7.41E-06	3.25E-05
Formaldehyde	7.50E-02	8.82E-03	3.86E-02	2.65E-04	1.16E-03
Hexane	1.80	2.12E-01	0.93	6.35E-03	2.78E-02
Naphthalene	6.10E-04	7.18E-05	3.14E-04	2.15E-06	9.43E-06
Toluene	3.40E-03	4.00E-04	1.75E-03	1.20E-05	5.26E-05
Arsenic	2.00E-04	2.35E-05	1.03E-04	2.35E-05	1.03E-04
Beryllium	1.20E-05	1.41E-06	6.18E-06	1.41E-06	6.18E-06
Cadmium	1.10E-03	1.29E-04	5.67E-04	1.29E-04	5.67E-04
Chromium	1.40E-03	1.65E-04	7.21E-04	1.65E-04	7.21E-04
Cobalt	8.40E-05	9.88E-06	4.33E-05	9.88E-06	4.33E-05
Lead	5.00E-04	5.88E-05	2.58E-04	5.88E-05	2.58E-04
Manganese	3.80E-04	4.47E-05	1.96E-04	4.47E-05	1.96E-04
Mercury	2.60E-04	3.06E-05	1.34E-04	3.06E-05	1.34E-04
Nickel	2.10E-03	2.47E-04	1.08E-03	2.47E-04	1.08E-03
Selenium	2.40E-05	2.82E-06	1.24E-05	2.82E-06	1.24E-05
		0.22	0.97	0.01	0.03

1 - Emission factor is from AP-42, 5th Edition, Section 1.4, 7/98

1. Process Description:

POET Biorefining - North Manchester operates an RTO to control emissions from the DDGS dryers. The RTO is equipped with five natural gas fired burners rated at 6 MMBtu/hr each for a total of 30 MMBTU/hr. The RTO burners are not equipped with burners to combust any fuel other than natural gas.

Attachment B: Emission Calculations
HAP Combustion Emissions from the Dryers and RTO

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

2. Potential to Emit (PTE) Combustion HAPs from the RTO:

HAP Pollutant	Emission Factor ¹ (lb/MMSCF)	Potential to Emit Emissions (Uncontrolled)	
		(lb/hr)	(ton/yr)
Benzene	2.10E-03	6.18E-05	2.71E-04
Formaldehyde	7.50E-02	2.21E-03	9.66E-03
Hexane	1.80	5.29E-02	0.23
Naphthalene	6.10E-04	1.79E-05	7.86E-05
Toluene	3.40E-03	1.00E-04	4.38E-04
Arsenic	2.00E-04	5.88E-06	2.58E-05
Beryllium	1.20E-05	3.53E-07	1.55E-06
Cadmium	1.10E-03	3.24E-05	1.42E-04
Chromium	1.40E-03	4.12E-05	1.80E-04
Cobalt	8.40E-05	2.47E-06	1.08E-05
Lead	5.00E-04	1.47E-05	6.44E-05
Manganese	3.80E-04	1.12E-05	4.90E-05
Mercury	2.60E-04	7.65E-06	3.35E-05
Nickel	2.10E-03	6.18E-05	2.71E-04
Selenium	2.40E-05	7.06E-07	3.09E-06
		0.06	0.24

1 - Emission factor is from AP-42, 5th Edition, Section 1.4, 7/98

3. Total Combustion HAPs from Dryers and RTO

HAP Pollutant	CAS	Potential to Emit Emissions (Uncontrolled)		Potential to Emit Emissions (Controlled)	
		(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Benzene	71-43-2	3.09E-04	1.35E-03	6.92E-05	3.03E-04
Formaldehyde	50-00-0	1.10E-02	4.83E-02	2.47E-03	1.08E-02
Hexane	110-54-3	0.26	1.16	0.06	0.26
Naphthalene	91-20-3	8.97E-05	3.93E-04	2.01E-05	8.80E-05
Toluene	108-88-3	5.00E-04	2.19E-03	1.12E-04	4.91E-04
Arsenic	7440-38-2	2.94E-05	1.29E-04	2.94E-05	1.29E-04
Beryllium	7440-41-7	1.76E-06	7.73E-06	1.76E-06	7.73E-06
Cadmium	7440-43-7	1.62E-04	7.09E-04	1.62E-04	7.09E-04
Chromium	7440-47-3	2.06E-04	9.02E-04	2.06E-04	9.02E-04
Cobalt	7440-48-4	1.24E-05	5.41E-05	1.24E-05	5.41E-05
Lead	NA	7.35E-05	3.22E-04	7.35E-05	3.22E-04
Manganese	7439-96-5	5.59E-05	2.45E-04	5.59E-05	2.45E-04
Mercury	7439-97-6	3.82E-05	1.67E-04	3.82E-05	1.67E-04
Nickel	7440-02-0	3.09E-04	1.35E-03	3.09E-04	1.35E-03
Selenium	7782-49-2	3.53E-06	1.55E-05	3.53E-06	1.55E-05
		0.28	1.22	0.06	0.28

Methodology

Potential Emission (lbs/hr) = Throughput (MMBtu/hr) x Emission Factor (lb/MMCF) x 1 MMCF/1,020 MMBtu

Potential Emission (tons/yr) = Throughput (MMBtu/hr) x Emission Factor (lb/MMCF) x 1 MMCF/1,020 MMBtu/2,000 lb/ton x 8,760 hrs/yr

**Attachment B: Emission Calculations
Centrifuges (EU024)**

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

Whole stillage is pumped to the centrifuges where the solids (wet cake) is separated from the liquid (thin stillage). A fraction of the residual VOC and HAP contained in the whole stillage is emitted from the centrifuges during the separation process.

Emission data from a performance test completed on April 18, 2017 for the centrifuge stacks at the POET plant in Mitchell, SD was used to calculate the potential to emit. The maximum performance test run result for each pollutant is increased linearly to correspond with the proposed centrifuge process rate and then a safety factor is added.

The centrifuges (EU024) are normally vented to the RTO. It has been determined that during RTO downtime, the centrifuges are not required to be controlled. During RTO downtime, emissions are vented to stack SV017. See TSD for 169-37113-00068.

POET - Mitchell Stack Test Results April 18, 2017

Test Results	Run 1	Run 2	Run 3	Average	Maximum
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
VOC	1.92	1.82	1.57	1.77	1.920
Formaldehyde	0.0020	0.0020	0.0020	0.002	0.002
Methanol	0.0040	0.0040	0.0040	0.004	0.004
Acetaldehyde	0.1620	0.1580	0.1230	0.148	0.162
Acrolein	0.0092	0.0105	0.0019	0.0072	0.011
Total HAP				0.1609	0.1785

Process rates associated with above stack test results

Process Rates =	Run 1	Run 2	Run 3	Average
	gpm	gpm	gpm	gpm
Centrifuges 1-4	831.68	831.43	821.48	828.2
Total				828.20

1,150 gallons liquid per minute through all centrifuges
69,000 gallons liquid per hour through all centrifuges
604,440,000 gallons liquid per year through all centrifuges
500 Limited RTO Bypass Condition hours per year
1.3 Safety Factor

	Uncontrolled Emission Rate		Limited Emission Rate	
	lb/hr	tpy	lb/hr	tpy
Total VOC	3.33	14.60	3.33	0.83
Formaldehyde	0.003	0.015	0.003	0.001
Methanol	0.007	0.030	0.007	0.002
Acetaldehyde	0.281	1.232	0.281	0.070
Acrolein	0.018	0.080	0.018	0.005
Total HAP	0.31	1.36	0.31	0.08

**Attachment B: Emission Calculations
Wet Cake**

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

Wet cake production storage and loadout is a source of VOC and HAP emissions because the wet cake contains a small quantity of ethanol and HAPs. This source is not controlled. The emission factors for this process come from emissions testing at a similar facility. The operation of the dryers and DDGS cooler represent the "worst case" emission scenario and thus are presented in the potential to emit summary.

Wetcake is the grain solids from the whole stillage centrifuges, before being conveyed to the DDGS dryers. If it is not dried to produce DDGS, wetcake is stored on an outdoor pad located adjacent to the process building. Wetcake contains a small amount of residual VOC and HAP which are emitted during storage. Wetcake is loaded into trucks using a frontend loader. Since the wetcake has a high moisture content, wetcake loadout is not a source of particulate matter emissions.

Modified wetcake is being produced as local users may prefer the product over DDGS. DDGS is produced by the two dryers operating in series. Modified wet cake has been dried by only one dryer. It is drier than wet cake but not as dry as DDGS, and contains approximately 50% moisture.

The production of DDGS represent the "worst case" emission scenario as emissions from the dryers/TO and the fluid bed cooler are greater than partially dried wet cake. The worst case emissions are presented in the potential to emit summary.

Wet cake production, storage and loadout is a source of VOC and HAP emissions because the wet cake contains a small quantity of ethanol and HAPs. This source is not controlled. The emission factors for this process were based on a wet cake analysis completed in April 2015. All VOC and HAP in the wet cake are assumed to be emitted. This operating scenario will be limited based on production per calendar year. Wetcake will be produced when the dryers are off-line. Based on customer demand, a portion of the distillers grains production may be diverted from the dryers to the wetcake pad for off-site sale. Therefore, wetcake may be stored on the wetcake pad at the same time that the dryers and DDGS cooler are operating at full or partial capacity.

Given:

Capacity = 78 tons/hr maximum wetcake production rate
 683,280 tons/yr

1. Emission Factors

VOC 0.008300 lb/ton of wet cake produced
 Acetaldehyde 0.000100 lb/ton of wet cake produced
 Methanol 0.000040 lb/ton of wet cake produced
 Formaldehyde 0.000200 lb/ton of wet cake produced
 Acrolein 0.000020 lb/ton of wet cake produced

Data Source

DENCO 2004 Test
 DENCO 2004 Test
 DENCO 2004 Test
 DENCO 2004 Test
 DENCO 2004 Test

2. Potential to Emit

Pollutant	lb/hr	Ton/yr
VOC	0.6474	2.8356
Acetaldehyde	0.0078	0.0342
Methanol	0.0031	0.0137
Formaldehyde	0.0156	0.0683
Acrolein	0.0016	0.0068

Attachment B: Emission Calculations
 PMPM10/PM2.5 and VOC Emissions - From the DDCS Cooler (EU028)

Company Name: POET Bio-refining - North Manchester, LLC
 Address City IN ZIP: 888 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

1. Potential to Emit PMPM₁₀ / PMPM_{2.5}:

Baghouse ID	Process Description	Control Device	Outlet Grain Loading (gr/dscf)	Maximum Air Flow Rate (scfm)	PTE of PM ₁₀ after Control *		PTE of PM _{2.5} after Control **		Control Efficiency (%)	PTE of PM ₁₀ before Control	PTE of PM _{2.5} before Control	Limited PTE of PM ₁₀ (200 hrs/yr) (t/yr)	Limited PTE of PM _{2.5} (200 hrs/yr) (t/yr)
					lb/yr	ton/yr	lb/yr	ton/yr					
CE010	DDCS Cooler	Baghouse CE010	0.004	23,800	0.82	3.57	0.82	3.57	99%	81.60	357.41	81.60	357.41
					lb/yr	ton/yr	lb/yr	ton/yr	%	lb/yr	ton/yr	lb/yr	ton/yr

* Assume all PM emissions equal PMPM₁₀ emissions.
 ** Alternate Operating Scenario PM emissions are exhausted as controlled and VOC/HAP emissions are exhausted as uncontrolled through the DDCS Cooler baghouse stack.

Methodology:
 PTE before Control (lb/yr) = Outlet Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 min/hr x 17000 hr/yr
 PTE after Control (lb/yr) = Outlet Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 min/hr x 17000 hr/yr x 1 ton/2000 lbs
 PTE of before Control (ton/yr) = PTE of after Control (ton/yr) / (1 - Control Efficiency)

2. Potential to Emit VOC:
 Proposed Beerfeed = 1,200 GPM
 Hours of Operations = 8760 hrs/year
 VOC Safety Factor = 1.5
 HAP Safety Factor = 2

North Manchester Stack Test - 02/26/2013

Test Results	Run 1	Run 2	Run 3	Average
VOC	1.74	1.85	1.24	1.61
Acetaldehyde	0.16	0.17	0.13	0.15
Process Rate	Run 1	Run 2	Run 3	Average
Beerfeed	855	855	855	855

Graton Stack Test - 6/06/2003

Test Results	Run 1	Run 2	Run 3	Average
Methanol	0.05	0.06	0.05	0.05
Acrolein	0.02	0.02	0.02	0.02
Formaldehyde	0.01	0.01	0.01	0.01
Process Rate	Run 1	Run 2	Run 3	Average
Beerfeed	580	580	580	580

March Emission Testing Test - 04/23/2024 - 04/24/2024 - SVO10 (Flue Gas)

SO2	4/23/2024	4/24/2024	Average
lb/hr	0.55	0.26	0.40
ton/yr	0.55	0.26	0.40

SO2	Uncontrolled Potential to Emit		Controlled Potential to Emit		Permit Limit
	lb/hr	TPY	lb/hr	TPY	
SO2	0.84	3.69	0.84	3.69	4.39
VOC	3.39	14.65	3.39	14.65	24.30
Acetaldehyde	0.42	1.67	0.42	1.67	
Acrolein	0.08	0.36	0.08	0.36	
Formaldehyde	0.04	0.18	0.04	0.18	
Carbonyl Sulfide	0.02	0.07	0.02	0.07	
Carbon Disulfide	0.02	0.08	0.02	0.08	
Total HAPs	0.78	3.40	0.78	3.40	

* The emission rates used to calculate limited PTE for formaldehyde and acrolein are based on scaled stack test data plus an additional safety factor; these emission rates are not limits in the current permit. Sulfur HAPs are assumed to be twice the emission rate of the DDCS Silo Baghouse.

SO2 is calculated based on maximum engineering test result and a 1.5 safety factor. Limited PTE of 1.00 lb/hr adds additional buffer.

Methodology:
 PTE Before Control (lb/hr) = PTE After Control (lb/hr)
 PTE Before Control (ton/yr) = PTE Before Control (lb/hr) x 8760 hours / 2,000 lbs
 PTE After Control (lb/hr) = stack test result (lb/hr) / issued throughput (ton/hr) x proposed throughput (ton/hr) x safety factor
 Limited PTE (lb/hr) = lb/hr emission rate in current permit and requested permit limits
 Limited (ton/yr) = Limited PTE (lb/hr) x 8760 hours / 2,000 lbs

Attachment B: Emission Calculations
 VOC Emission Calculations - Ethanol's Load-out Tanks (E008) and Flare (E015)

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Reviewer:

Emission Factors: AP-42, Chapter 5.2, Section 5.2, June 2008

Denatured ethanol (95% to 98% ethanol) and E85 (70% to 95% ethanol) will be shipped by either truck loading rack or railcar loading rack. Railcars will be dedicated fleets, but the trucks may be used to carry gasoline prior to filling with ethanol. Both railcars and trucks will be filled by submerged loading process. Each loading operation will be controlled by a flare (E015), which has a flare efficiency of 95%. The calculations on this page do not differentiate underdenatured ethanol (loadout from denatured ethanol loadout). Denatured ethanol loadout would result in greater emissions and these calculations conservatively assume that all ethanol is added out is denatured ethanol.

According to AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids (56/09), the VOC emission factors for the truck and rail loading racks can be estimated from the following equation:

$$L = 12.46 \times (S \times P \times M) / T$$

where:
 L = loading loss (lb/kgal)
 S = a saturation factor (see AP-42, Table 5.2-1)
 P = true vapor pressure of the liquid loaded (psia) based on TANKS 4.0.9d from December 2016 for Fort Wayne, IN
 M = molecular weight of vapors
 T = temperature of the bulk liquid loaded (degrees R)

	S	P (psia)	M (lb/mole lb/g)	T (degrees R)	L (lb/kgal)
Gasoline (dedicated vapor balance)	1.0	5.58	68.00	516	0.39
Gasoline (clean cargo)	0.5	5.58	68.00	516	4.44
E-85 Ethanol (dedicated normal)	0.6	2.16	55.02	516	1.75
E-85 Ethanol (clean cargo)	0.5	2.16	55.02	516	1.45
Denatured Ethanol (dedicated normal)	0.6	0.95	49.34	516	0.69
Denatured Ethanol (clean cargo)	0.5	0.95	49.34	516	0.57
Underdenatured Ethanol (dedicated normal)	0.6	0.15	46.07	516	0.59
Underdenatured Ethanol (clean cargo)	0.5	0.15	46.07	516	0.42

	Denaturant Content
Denatured Ethanol =	6%
E85 =	30%
Underdenatured Ethanol =	0%

Source-Specific Emission Factors

The emission factor for loading denatured ethanol to rail which previously contained denatured ethanol
 = L (Denatured ethanol, normal) = Denatured Ethanol to Rail
 The emission factor for loading E-85 to rail which previously contained denatured ethanol or E-85
 = L (Denatured ethanol, normal) = E-85 to Rail
 The emission factor for loading underdenatured ethanol to rail which previously contained denatured ethanol
 = L (Denatured ethanol, dedicated vapor balance) + L (Underdenatured ethanol, clean cargo) = Underdenatured Ethanol to Rail
 The emission factor for loading denatured ethanol to trucks which stored gasoline previously
 = L (gasoline, dedicated vapor balance) + L (gasoline, clean cargo) + L (denatured ethanol, clean cargo) = Denatured Ethanol to Truck
 The emission factor for loading E-85 to trucks which stored gasoline previously
 = L (gasoline, dedicated vapor balance) + L (gasoline, clean cargo) + L (E-85, clean cargo) = E-85 to Truck
 The emission factor for loading underdenatured ethanol to trucks which stored gasoline previously
 = L (gasoline, dedicated vapor balance) + L (gasoline, clean cargo) + L (Underdenatured ethanol, clean cargo) = Underdenatured Ethanol to Truck

	Denatured Ethanol to Rail	E-85 to Rail	Underdenatured Ethanol to Rail	Denatured Ethanol to Truck	E-85 to Truck	Underdenatured Ethanol to Truck
	0.69	1.75	0.50	0.51	0.59	0.46

Attachment B: Emission Calculations
 VOC Emission Calculations - Ethanol/EGS Load-out Racks (EU018) and Plaza (CEH15)

Company Name: POET Biorefining - North Manchester, LLC
 Address City, IN Zip: 868 East 80th North, North Manchester, Indiana 46362
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

1. Throughputs:

Throughput	Truck and Rail Combined (Maximum)	Ethanol Loading Capacity
Denatured Ethanol (denatured)	111.89	Truck (gallons): 78,000
E85 (ethicapped)	12.43	Rail (gallons): 144,000
		Total (Maximum): 1,945

2. Hourly Potential to Emit (Annual Unlimit)

Throughput	Maximum Loading Capacity	Uncontrolled Emission Factor (lb/hr)	Emissions Uncontrolled (lb/hr)	Emissions Uncontrolled Efficiency	Controlled Emission Factor (lb/hr)	Emissions Controlled (lb/hr)	Emissions Controlled Efficiency
Denatured Ethanol loaded out via truck:	78	5.07	391.07	1,712.52	98%	7.62	34.25
Denatured Ethanol loaded out via rail:	144	0.68	99.16	428.93	98%	1.66	0.80
Un-denatured ethanol loaded out via truck:	78	4.86	373.18	1,660.80	98%	7.58	33.22
Un-denatured ethanol loaded out via rail:	144	0.50	71.95	316.14	98%	1.44	6.30
E85 loaded out via truck:	78	5.90	460.38	2,017.24	98%	9.21	40.35
E85 loaded out via rail:	144	1.75	252.29	1,065.91	96%	5.05	22.10
Worst case scenario =	5,834,160		712.87	3,122.25		14.26	82.45

Emissions Uncontrolled (lb/hr) = Throughput (kgal/yr) x Emission Factor (lb/kgal)
 Emissions Controlled (lb/hr) = Emissions Uncontrolled (lb/hr) x (1 - Control Efficiency)

3. Limited Annual Potential to Emit:

Throughput	Uncontrolled Emission Factor (lb/hr)	Emissions Uncontrolled (lb/hr)	Control Efficiency	Controlled Emission Factor (lb/hr)	Emissions Controlled (lb/hr)
All denatured ethanol loaded out via truck:	111.892	5.07	98%	0.258	28.67
All denatured ethanol loaded out via rail:	111.892	0.68	98%	0.014	1.24
All un-denatured ethanol loaded out via truck:	111.892	4.86	98%	0.097	10.76
All un-denatured ethanol loaded out via rail:	111.892	0.50	98%	0.010	1.15
All E85 loaded out via truck:	124.32	5.90	98%	0.118	14.58
All E85 loaded out via Rail:	124.32	1.75	98%	0.035	4.35
Worst case scenario =	124.324				37.76
Limited Emissions =					7.34

* Total throughput is limited in order for HAP emission to be less than major source levels.
 Emissions Uncontrolled (lb/yr) = Throughput (kgal/yr) x Emission Factor (lb/kgal) / 2000 (lb/ton)
 Emissions Controlled (lb/yr) = Emissions Uncontrolled (lb/yr) x (1 - Control Efficiency)
 Plaza Control Efficiency = 98%

Attachment B: Emission Calculations
 VOC Emission Calculations - Ethanol/E85 Load-out Racks (EU09) and Flare (CE015)

Company Name: POET BioRefining - North Manchester, LLC
 Address: 888 East 810 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Reviewer:

4. Potential to Emit HAPs:

HAP	Gasoline HAP Fraction ¹	Denatured HAP Fraction ²	Undenatured Ethanol HAP Fraction ³	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	E85 to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck	E85 to Truck
Acetaldehyde	0.00E+00	0.00E+00	4.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	2.30E-03	2.20E-03	0.00E+00	7.50E-05	2.10E-04	4.91E-04	2.10E-04	1.77E-04	4.09E-04
Cumene	1.00E-02	0.00E+00	0.00E+00	0.00E+00	1.25E-05	1.15E-03	1.02E-01	1.02E-01	1.03E-01
Ethylbenzene	2.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.44E-02	4.44E-02	4.44E-02
Hexane	7.00E-02	2.74E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.89E-02	8.89E-02	8.89E-02
Methanol	0.00E+00	0.00E+00	2.00E-04	3.34E-03	1.55E-03	1.44E-01	3.11E-01	3.11E-01	4.31E-01
Nonane	1.00E-01	0.00E+00	0.00E+00	1.30E-04	1.05E-04	2.45E-04	1.05E-04	8.33E-05	2.04E-04
Xylenes	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.67E-01	6.67E-01	6.67E-01
Total	0.47	0.28	0.00	0.01	0.30	0.15	3.29	3.29	2.80

¹This is the highest HAP percentage for gasoline vapors as per the Flint Hills gasoline SDS issue date of 12-03-2014. Assumed truck tanker hauler gasoline for prior load.

²Based on the average weight fraction of the denaturant used at the plant (Marwest 2016 data).

³Assumed weight fraction in 200 proof ethanol, based on testing done by POET in Feb and March 2016.

Attachment B: Emission Calculations
 VOC Emission Calculations - Ethanolless Load-out Racks (ELOS) and Flare (CEHS)

Company Name: POET BioRefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Reviewer:

HAP	Hourly Potential to Emit Before Control				Worst Case Total	Unlimited PTE Before Control
	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck		
Acetaldehyde	0.04	0.03	0.02	0.01	0.10	0.45
Benzene	0.01	0.01	0.01	0.01	0.04	0.45
Cumene	0.00	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00
Hexane	1.34	0.22	24.69	33.63	64.37	30.37
Methanol	0.02	0.02	0.01	0.01	0.05	0.22
Toluene	0.00	0.00	0.01	0.01	0.01	0.01
Xylenes	0.00	0.00	0.01	0.01	0.01	0.01
Total	1.41	0.27	147.85	148.97	177.15	718.91

HAP	Hourly Potential to Emit After Control				Worst Case Total	Unlimited PTE After Control	Permit Limits
	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck			
Acetaldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Benzene	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Cumene	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Hexane	0.03	0.41	0.49	0.67	1.60	0.00	0.04
Methanol	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Xylenes	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Total	0.03	0.42	2.95	3.12	3.54	15.518	0.04

HAP	Limited Annual Potential to Emit				Limited Potential to Emit After Control
	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck	
Acetaldehyde	0.00	0.00	0.00	0.00	0.00
Benzene	0.00	0.00	0.00	0.00	0.00
Cumene	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00
Hexane	0.10	0.22	0.36	0.35	0.41
Methanol	0.00	0.00	0.00	0.00	0.00
Toluene	0.00	0.00	0.00	0.00	0.00
Xylenes	0.00	0.00	0.00	0.00	0.00
Total	0.10	0.22	2.11	2.10	2.35

Permit Limits	Factor	ton/yr
Unlimited PTE Before Control	0.00	0.00
Unlimited PTE After Control	0.00	0.00
Permit Limits	2.49	2.49
Permit Limits	2.49	2.49
Permit Limits	2.49	2.49
Permit Limits	2.49	2.49

Methodology
 HAP emissions are based on worst-case emission scenario.
 HAP emission factors are based on content of HAP in product (denaturant, gasoline, or ethanol), content of material in product (EHS, denatured ethanol, or undenatured ethanol), and VOC emission factor calculations above.
 PTE of HAP before control (lb/yr) = Uncontrolled HAP Emission Factor (lb/kgal) x Load Rate (kgal/yr) / 1000 (kgal/ton)
 PTE of HAP after control (lb/yr) = Worst Case PTE of HAP before control (lb/yr) x (1 - Control Efficiency) / 1000 (kgal/ton)
 PTE of HAP after control (lb/yr) = Worst Case PTE of HAP after control (lb/yr) x (1 - Control Efficiency) / 1000 (kgal/ton)
 Limited PTE of HAP after control (lb/yr) = Uncontrolled HAP Emission Factor (lb/kgal) x throughput (Mgal/yr) x (1 - Control Efficiency) / 2,000 (lb/ton)

5. Flare Emissions from Combustion of VOC from the Ethanol Loading Rack

Max Hourly Rate (Truck + Rail)
 kgal/yr
 222.0

Pollutant	NOx ^a
CO ^a	0.0334
CO ^b	19.85
UNRESTRICTED POTENTIAL TO EMIT (TPY)	32.48
LIMITED POTENTIAL TO EMIT (TPY)	5.22

Emission factors for NO_x and CO are based on the information provided by the flare manufacturer (John Zink Company).
 For CO and NO_x, unrestricted PTE is equal to the controlled PTE, as these pollutants are generated at the flare.
 PM₁₀, PM_{2.5}, and SO_x emission factors are negligible due to the smokesheet design and minimal H₂S levels in the fuel. Potential emissions from natural gas for the pilot flame are estimated on the following page.

VOC emission calculations can be found above in loading rack calculations.

Attachment B: Emission Calculations
Flare Pilot Flame - Natural Gas Combustion < 100 MMBtu/hr

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

Max. Heat Input Capacity	Potential Throughput
MMBtu/hr	MMCF/yr
0.054	0.4638

	Pollutant						
	PM*	PM ₁₀ *	PM _{2.5} *	SO ₂	NO _x **	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	100	5.5	84
Potential Emission in tons/yr	4.41E-04	1.76E-03	1.76E-03	1.39E-04	2.32E-02	1.28E-03	1.95E-02

*PM emission factor is filterable PM only. PM₁₀ emission factor is condensable and filterable PM₁₀ combined. PM_{2.5} emission factor is equal to PM₁₀.

**The Emission Factor for NO_x is from AP-42 Chapter 1 Table 1-4.1 for natural gas combustion for uncontrolled emissions from small boilers rated less than 100 MMBtu/hr.

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu

Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

HAP emissions calculations

	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.80	3.4E-03
Potential Emission in tons/yr	4.87E-07	2.78E-07	1.74E-05	4.17E-04	7.88E-07

	HAPs - Metals					Total HAP
	Lead	Cadmium	Chromium	Manganese	Nickel	
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03	
Potential Emission in tons/yr	1.16E-07	2.55E-07	3.25E-07	8.81E-08	4.87E-07	4.38E-04

Methodology is the same as above

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Attachment B: Emission Calculations
Boilers - Natural Gas Combustion > 100 MMBtu/hr

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

Individual Heat Input Capacity for Boiler #1 & Boiler #2 MMBtu/hr	Combined Heat Input Capacity for Boiler #1 & Boiler #2 MMBtu/hr	Potential Throughput MMCF/yr
143	286	2,456

Particulate Emission Limitations for Sources of Indirect Heating:
 Emission Limitations for facilities specified in 326 IAC 6-2-1(d)

$$Pt = 1.09 / Q^{0.26} = 0.25 \text{ lb/MMBtu}$$

	Pollutant						
	PM*	PM ₁₀ *	PM _{2.5} *	SO ₂	NO _x **	VOC	CO***
Emission Factor in lb/MMCF (AP-42)	1.9	7.6	7.6	0.6		5.5	
Emission Factor in lb/MMCF (test data)					30		20
Potential Emission in tons/yr	2.33	9.33	9.33	0.74	36.84	6.75	24.56

*PM emission factor is filterable PM only. PM₁₀ emission factor is condensable and filterable PM₁₀ combined. PM_{2.5} emission factor is condensable and filterable PM_{2.5} combined.

**The Emission Factor for NO_x from AP-42 Chapter 1 Table 1-4.1 (for natural gas combustion for low NO_x burners) is 140 lb/MMCF. The source used manufacturer's certified emission factors for the low NO_x burners in a previous FESOP permit. The manufacturer's emission factors are less than the AP-42 values (30 lb of NO_x/MMCF) and have been verified by performance testing.

***The Emission Factor for CO is 84 from AP-42 Chapter 1 Table 1-4.1 for natural gas combustion. The source used manufacturer's certified emission factors in a previous FESOP permit. The manufacturer's emission factors are less than the AP-42 values (20 lb of CO/MMCF) and have been verified by performance testing.

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu

Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

HAP emissions calculations

	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.80	3.4E-03
Potential Emission in tons/yr	2.58E-03	1.47E-03	9.21E-02	2.21	4.18E-03

	HAPs - Metals					Total HAP
	Lead	Cadmium	Chromium	Manganese	Nickel	
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03	
Potential Emission in tons/yr	6.14E-04	1.35E-03	1.72E-03	4.67E-04	2.58E-03	2.32

Methodology is the same as above

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Attachment B: Emission Calculations
VOC Emission Calculations - Storage Tanks and Centrifuges

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

Emissions were calculated using the TANKS 4.0 Program.

VOC Emission Calculations - Storage Tanks T001 - T005, T009								
Tank	Contents ¹	Annual Throughput (gal)	Capacity (gal)	Avg. Capacity (gal/min)	No. of Turn Overs	Emissions		
						lb/year	lb/hr	Ton/year
T001	190 Proof Ethanol	115,000,000	250,000	219	460.0	878.68	0.10	0.44
T002	Denaturant	6,184,879	250,000	12	24.7	1,981	0.23	0.99
T003	200-Proof Ethanol	115,000,000	2,000,000	219	57.5	532.09	0.06	0.27
T004	200-Proof Ethanol	115,000,000	2,000,000	219	57.5	532.09	0.06	0.27
T005	Denaturant	3,139,445	126,900	6	24.7	1,912	0.22	0.96
T009	Gasoline	2,200	265	0.00	8.3	345	0.04	0.17
Total						6,181	0.71	3.09
* Emissions were calculated using Tanks 4.0.9d software and submitted by the source for the SSM 168-37113-00068.								
¹ Assume: 190-Proof Ethanol is 100% ethyl alcohol in TANKS calculations. Denaturant is 100% gasoline (RVP 15) in TANKS calculations. 200-Proof Ethanol is 100% ethyl alcohol in TANKS calculations.								
Total amount meeting definition of "gasoline" under 40 CFR 63.11100:						0 gal/day		

HAP Emission Calculations - Storage Tanks T001 - T005, T009										
Tank	Contents	Emissions								
		Acetaldehyde ton/year	Benzene ton/year	Cumene ton/year	Ethylbenzene ton/year	Hexane ton/year	Methanol ton/year	Toluene ton/year	Xylenes ton/year	Total HAP ton/year
T001	190 Proof Ethanol	1.76E-04	0.00	0.00	0.00	0.00	8.79E-05	0.00	0.00	2.64E-04
T002	Denaturant	0.00	2.18E-03	0.00	0.00	2.71E-01	0.00	0.00	0.00	0.27
T003	200-Proof Ethanol	1.06E-04	0.00	0.00	0.00	0.00	5.32E-05	0.00	0.00	1.60E-04
T004	200-Proof Ethanol	0.00	0.00	0.00	0.00	5.32E-05	0.00	0.00	0.00	5.32E-05
T005	Denaturant	0.00	2.10E-03	0.00	0.00	2.62E-01	0.00	0.00	0.00	0.26
T009	Gasoline	0.00	3.97E-03	1.72E-03	3.45E-03	1.21E-02	0.00	2.59E-02	2.59E-02	0.07
Total		2.82E-04	0.01	1.72E-03	3.45E-03	0.55	1.41E-04	0.03	0.03	0.61

Attachment B: Emission Calculations
VOC Emission Calculations - Storage Tanks and Centrifuges

Company Name: POET Biorefining - North Manchester, LLC
 Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

HAP	Gasoline HAP Fraction ¹	Denaturant HAP Fraction ²	Undenatured Ethanol HAP Fraction ³
Acetaldehyde	0.00E+00	0.00E+00	4.00E-04
Benzene	2.30E-02	2.20E-03	0.00E+00
Cumene	1.00E-02	0.00E+00	0.00E+00
Ethylbenzene	2.00E-02	0.00E+00	0.00E+00
Hexane	7.00E-02	2.74E-01	0.00E+00
Methanol	0.00E+00	0.00E+00	2.00E-04
Toluene	1.50E-01	0.00E+00	0.00E+00
Xylenes	1.50E-01	0.00E+00	0.00E+00

¹This is the highest HAP percentage for gasoline vapors as per the Flint Hills gasoline SDS, issue date of 12-03-2014. Assumed truck tanker hauled gasoline for prior load.

²Based on the average weight fraction of the denaturant used at the plant (Markwest 2016 data)

³Assumed weight fraction in 200 proof ethanol, based on testing done by POET in Feb and March 2016.

VOC Emission Calculations - Tanks EU040 - EU046								
Tank	Contents	Annual Throughput (gal)	Capacity (gal)	Avg. Capacity (gal/min)	No. of Turn Overs	Emissions		
						lb/year	lb/hr	Ton/year
EU040	corn oil / defatted syrup	70,956,000	1,000	135	70,956	10.19	1.16E-03	5.10E-03
EU041	corn oil / defatted syrup	42,048,000	1,000	80	42,048	6.05	6.91E-04	3.03E-03
EU042	corn oil / defatted syrup	26,280,000	500	50	52,560	3.78	4.32E-04	1.89E-03
EU043	corn oil / defatted syrup	15,768,500	2,350	30	6,710	2.59	2.96E-04	1.30E-03
EU044	corn oil / defatted syrup	7,884,000	200	15	39,420	1.13	1.29E-04	5.65E-04
EU045	corn oil / defatted syrup	2,628,000	30,000	15	263	0.34	3.88E-05	1.70E-04
EU046	corn oil / defatted syrup	2,628,000	30,000	15	263	0.34	3.88E-05	1.70E-04
Total						24.42	2.79E-03	1.22E-02
VOC Emission Calculations - Centrifuges EU038 - EU039								
Unit	Contents	Annual Throughput (gal)	Avg. Capacity (gal/min)	Avg. Capacity (gal/min)	No. of Turn Overs	Emissions		
						lb/year	lb/hr	Ton/year
EU038	corn "syrup"	70,956,000	135	135	NA	10.17	1.16E-03	5.09E-03
EU039	corn "syrup"	42,048,000	80	80	NA	6.02	6.87E-04	3.01E-03
Total						16.19	1.85E-03	8.10E-03

Attachment B: Emission Calculations
VOC and HAP Emissions From Equipment Leaks

Company Name: POET Bioethanol - North Manchester, LLC
Address: City IN ZIP: 888 East 800 North, North Manchester, Indiana 46901
Significant source identification No.:
Significant Permit Modification No.:
Reviewer:

1. Fugitive VOC Emissions:

Process Stream	Equipment Component Source	Product	Component Count	Emission Factor (lb/comp-hr)	Uncontrolled Rate (lb/hr)	Subpart VVs Control Effectiveness (%)	Controlled Rate (lb/hr)	TOC Weight (%)	Emitted Water (lb/hr)	Controlled TOC (ton/yr)
EU011 - EU023 Distillation	Valves	Gas/Vapor	37	0.013134	2.13	92%	0.21	100%	0	0.039
	Valves	Light Liquid	299	0.00989	2.86	88%	0.32	100%	0	0.319
	Pump Seals	Gas/Vapor	8	0.04378	0.35	75%	0.09	100%	0	0.083
	Compressors	Gas/Vapor	0	0.5016	0		0	100%	0	0
	Relief Valves	Gas/Vapor	11	0.2288	2.52	92%	0.20	100%	0	0.201
	Sampling Connections	All	0	0.0033	0		0	100%	0	0
	Open Ended Lines	All	0	0.00374	0		0	100%	0	0
	Connectors	All	1314	0.004026	5.29	93%	0.37	100%	0	0.370
	Valves	Gas/Vapor	2	0.013134	0.03	92%	0.00	15%	0.002	0.000
	Valves	Light Liquid	176	0.00989	1.58	88%	0.19	15%	0.159	0.028
EU011 - EU023 Fermentation	Pump Seals	Gas/Vapor	10	0.04378	0.44	75%	0.11	15%	0.093	0.072
	Compressors	Gas/Vapor	0	0.5016	0		0	15%	0	0
	Relief Valves	Gas/Vapor	0	0.2288	0		0	15%	0	0
	Sampling Connections	All	0	0.0033	0		0	15%	0	0
	Open Ended Lines	All	0	0.00374	0		0	15%	0	0
	Connectors	All	554	0.004026	2.23	93%	0.16	15%	0.153	0.103
	Valves	Gas/Vapor	0	0.013134	0.00	92%	0.00	100%	0	0.000
	Valves	Light Liquid	44	0.00989	0.30	88%	0.03	100%	0	0.000
	Pump Seals	Gas/Vapor	3	0.04378	0.13	75%	0.03	100%	0	0.000
	Compressors	Gas/Vapor	0	0.5016	0		0	100%	0	0
T002, T006 Denaturant Tanks	Relief Valves	Gas/Vapor	2	0.2288	0.46	92%	0.04	100%	0	0.037
	Sampling Connections	All	0	0.0033	0		0	100%	0	0
	Open Ended Lines	All	0	0.00374	0		0	100%	0	0
	Connectors	All	167	0.004026	0.67	93%	0.05	100%	0	0.047
	Valves	Gas/Vapor	0	0.013134	0.00	92%	0.00	100%	0	0.000
	Valves	Light Liquid	187	0.00989	1.66	88%	0.20	100%	0	0.200
	Pump Seals	Gas/Vapor	6	0.04378	0.26	75%	0.07	100%	0	0.066
	Compressors	Gas/Vapor	0	0.5016	0		0	100%	0	0
	Relief Valves	Gas/Vapor	5	0.2288	1.37	92%	0.11	100%	0	0.110
	Sampling Connections	All	0	0.0033	0		0	100%	0	0
T001, T003 - T004 Non-denaturant tanks (200-Proof Tanks)	Open Ended Lines	All	0	0.00374	0		0	100%	0	0
	Connectors	All	868	0.004026	3.49	93%	0.24	100%	0	0.245
	Valves	Gas/Vapor	0	0.013134	0.00	92%	0.00	100%	0	0.000
	Valves	Light Liquid	187	0.00989	1.66	88%	0.20	100%	0	0.200
	Pump Seals	Gas/Vapor	6	0.04378	0.26	75%	0.07	100%	0	0.066
	Compressors	Gas/Vapor	0	0.5016	0		0	100%	0	0
	Relief Valves	Gas/Vapor	5	0.2288	1.37	92%	0.11	100%	0	0.110
	Sampling Connections	All	0	0.0033	0		0	100%	0	0
	Open Ended Lines	All	0	0.00374	0		0	100%	0	0
	Connectors	All	868	0.004026	3.49	93%	0.24	100%	0	0.245
TOTALS					24.00	105.14	2.26	100%	0.39	1.87

Methodology

Component count provided initially by source for initial permit. Source performed audit and updated component count SSM 168-3713-00068.
** Emission factors are from Protocol for Equipment Leak Emission Estimates, EPA-453/R-96-07, Table 2-1 and Table 5-2

2. Fugitive HAP Emissions:

Fugitive HAP Emissions (ton/yr) = Controlled TOC (ton/yr) x HAP Fraction

HAP	Denaturant HAP Fraction*	Undenatured Ethanol HAP Fraction**	Fugitive HAP Emissions (lb/yr)	Fugitive HAP Emissions (ton/yr)
Acetaldehyde	0.00E+00	4.00E-04	8.82E-04	2.98E-03
Benzene	2.26E-03	3.80E-04	1.85E-03	5.82E-03
Chloroform	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	2.74E-01	4.48E-02	1.96E-01	6.18E-01
Methanol	0.00E+00	2.00E-04	3.41E-04	1.49E-03
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			0.05	0.20

* Denaturant HAP fraction based on the average weight fraction of the denaturant used at the plant (Mar/leak 2016 data).
** Undenatured ethanol HAP content is the assumed weight fraction in 200 proof ethanol, based on testing done by POET in Feb and March 2016.

**Attachment B: Emission Calculations
Diesel Generator (for Electricity)**

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

Emissions calculated based on output rating (hp)

Output Horsepower Rating (hp)	2640.0
Unlimited Hours of Operation per Year	8760
Limited Hours of Operation per Year	500
Unlimited Potential Throughput (hp-hr/yr)	23,126,400
Limited Potential Throughput (hp-hr/yr)	1,320,000
Sulfur Content (S) of Fuel (% by weight)	0.002

	Pollutant						
	PM*	PM10*	PM2.5*	SO2	NOx	VOC	CO
Emission Factor in lb/hp-hr	7.00E-04	4.01E-04	3.89E-04	1.21E-05 (.00809S)	1.43E-02 **see below	7.05E-04	5.50E-03
Unlimited Potential Emissions in tons/yr	8.09	4.64	4.50	0.14	164.85	8.15	63.60
Limited Potential Emissions in tons/yr	0.46	0.26	0.26	0.01	9.41	0.47	3.63

*PM10 emission factor in lb/hp-hr was calculated using the emission factor in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.4-1).

**NOx emission factor based on rated speed "Not to exceed data" from the manufacturer

Hazardous Air Pollutants (HAPs)

	Pollutant						
	Benzene	Toluene	Xylene	Formaldehyde	Acetaldehyde	Acrolein	Total PAH HAPs***
Emission Factor in lb/hp-hr****	5.43E-06	1.97E-06	1.35E-06	5.52E-07	1.76E-07	5.52E-08	1.48E-06
Unlimited Potential Emission in tons/yr	6.28E-02	2.27E-02	1.56E-02	6.39E-03	2.04E-03	6.38E-04	1.72E-02
Limited Potential Emission in tons/yr	3.59E-03	1.30E-03	8.92E-04	3.65E-04	1.16E-04	3.64E-05	9.79E-04

***PAH = Polyaromatic Hydrocarbon (PAHs are considered HAPs, since they are considered Polycyclic Organic Matter)

****Emission factors in lb/hp-hr were calculated using emission factors in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.4-1).

Unlimited Potential Emissions of Total HAPs (ton/yr)	1.27E-01
Limited Potential Emissions of Total HAPs (ton/yr)	7.27E-03

Methodology

Emission Factors are from AP 42 (Supplement B 10/96) Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4

Potential Throughput (hp-hr/yr) = [Output Horsepower Rating (hp)] * [Limited Hours of Operation per Year]

**Attachment B: Emission Calculations
PM, PM10, and PM2.5 Emissions from Cooling Tower**

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

Water circulation flow =	30,000 gallons per minute
Water circulation flow =	113,562 liters per minute
Drift loss =	0.005%
Drift loss =	5.7 liters per minute
Total Dissolved Solids in cooling tower =	2500 mg/l
Total Dissolved Solids in cooling tower =	2.5 g/l
PM-10 = Drift loss (l/min) x TDS (g/l)	14.2 grams/minute
g/min x 60 =	851.7 grams/hr
1 pound =	453.6 grams
Fugitive emissions=	1.9 lbs/hr
Fugitive emissions=	8.22 TPY

Attachment B: Emission Calculations
VOC Emissions
Rate of Volatilization

Company Name: POET BioEnergy, North Manchester, IN, LLC
Address: PO Box 300, North Manchester, Indiana 47342
Superfund Site ID: 15-00000000000000000000
Superfund Permit ID: 15-00000000000000000000
Release:

POET BioEnergy, North Manchester, Indiana, LLC, is not a regulated party under the Superfund program. However, the site is located within a Superfund plume. The site is not a regulated party under the Superfund program. However, the site is located within a Superfund plume. The site is not a regulated party under the Superfund program. However, the site is located within a Superfund plume.

Given:	
Maximum annual emissions from Process Units:	114,231,000 gallons 31,900 gallons
Assumptions:	
Maximum Volatilization Factor:	50%
Maximum Volatilization Rate:	12%
Maximum Volatilization Rate:	10
Maximum Volatilization Rate:	10
Calculations:	
Maximum Volatilization Rate:	177,500,000
Maximum Volatilization Rate:	67,140,000

Task	Description	Value	Units	Notes
1	Estimated total VOC emissions from all sources	114,231,000	gallons	
2	Maximum Volatilization Factor	50%		
3	Maximum Volatilization Rate	12%		
4	Maximum Volatilization Rate	10		
5	Maximum Volatilization Rate	10		
6	Calculations	177,500,000		
7	Maximum Volatilization Rate	67,140,000		

Task	Description	Value	Units
1	Estimated total VOC emissions from all sources	114,231,000	gallons
2	Maximum Volatilization Factor	50%	
3	Maximum Volatilization Rate	12%	
4	Maximum Volatilization Rate	10	
5	Maximum Volatilization Rate	10	
6	Calculations	177,500,000	
7	Maximum Volatilization Rate	67,140,000	

Vapor Pressure Calculations

Compound	Molecular Weight (MW)	Boiling Point (BP)	Vapor Pressure (VP)
Diethyl Ether	74	35	10.5
Diethylamine	73	37	10.5
Diethylamine	73	37	10.5
Diethylamine	73	37	10.5
Diethylamine	73	37	10.5
Diethylamine	73	37	10.5

Vapor Pressure of Distilled Ethanol (gpa)

(1) Use weight percent of Distilled Fuel Ethanol

(2) Use weight percent of Distilled Fuel Ethanol

(3) Use weight percent of Distilled Fuel Ethanol

(4) Use weight percent of Distilled Fuel Ethanol

(5) Use weight percent of Distilled Fuel Ethanol

(6) Use weight percent of Distilled Fuel Ethanol

(7) Use weight percent of Distilled Fuel Ethanol

(8) Use weight percent of Distilled Fuel Ethanol

(9) Use weight percent of Distilled Fuel Ethanol

(10) Use weight percent of Distilled Fuel Ethanol

Uncontrolled Potential to Emit

Task	Description	Value	Units
1	Estimated total VOC emissions from all sources	114,231,000	gallons
2	Maximum Volatilization Factor	50%	
3	Maximum Volatilization Rate	12%	
4	Maximum Volatilization Rate	10	
5	Maximum Volatilization Rate	10	
6	Calculations	177,500,000	
7	Maximum Volatilization Rate	67,140,000	

Uncontrolled HAP Potential to Emit

HAP	HAP Fraction	Fugitive HAP Emissions (lb/yr)	Fugitive HAP Emissions (kg/yr)
Diethyl Ether	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Total	0.05	5,711,550	2,591,400

Controlled HAP Potential to Emit

HAP	HAP Fraction	Fugitive HAP Emissions (lb/yr)	Fugitive HAP Emissions (kg/yr)
Diethyl Ether	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Diethylamine	0.01	1,142,310	518,280
Total	0.05	5,711,550	2,591,400

Methodology

1. Use of the 50% volatilization factor from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

2. Use of the 12% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

3. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

4. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

5. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

6. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

7. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

8. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

9. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

10. Use of the 10% volatilization rate from the American Petroleum Institute (API) Technical Report 2003-10, "Evaporative Losses from the Cleaning of Storage Tanks, November 2003".

Table 1: VOC Emissions

Code	Name	Category	Quantity	Unit	Weight	Volume	Weight	Volume
15	Diethyl Ether	Organic Liquid	487	gallons	74	35	6.5	0.09
16	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
17	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
18	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
19	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
20	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09

Table 2: HAP Emissions

ID	Name	Category	Quantity	Unit	Weight	Volume	Weight	Volume
1	Diethyl Ether	Organic Liquid	487	gallons	74	35	6.5	0.09
2	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
3	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
4	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
5	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
6	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
7	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
8	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
9	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09
10	Diethylamine	Organic Liquid	487	gallons	73	37	5.9	0.09

Attachment B: Emission Calculations
 PM, PM10 and PM2.5 Emissions - Paved Road Traffic
 Company Name: POET Bioenergy - North Manchester, LLC
 Address City IN Zip: 818 East 800 North, North Manchester, Indiana 48982
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

All trucks are assumed to have an empty weight of 15 tons and a full weight of 40 tons. Actual ethanol and denaturant trucks have a capacity of 6,000 gallons and DDOGS trucks have a capacity of 25 tons.
 Assume for the limited potential to emit calculations that 100% of the ethanol and DDOGS are trucked off-site. Also assume that 100% of the denaturant and grain is received by truck. Actual operations will result in some of the ethanol and DDOGS being shipped off-site by rail.

Vehicle Information

Vehicle Type	Annual Limited Amount/Trucks	Quantity Transported per Truck	Max No. of Trucks Annually	Truck Empty Wt. (ton)	Truck Full Wt. (ton)	Truck Average Wt. (ton)	Total distance (miles)	Annual VMT
DDOGS Haul Out	322,000 Ton	25 ton	12,880	15	40	27.5	27.5	9,680
Ethanol Haul Out	124,324,324 gal	8,000 gal	15,541	15	40	27.5	27.5	11,655
Denaturant Delivery	9,324,324 gal	9,000 gal	1,168	15	40	27.5	27.5	674
Grain Delivery	1,150,000 ton	25 ton	45,000	15	40	27.5	27.5	34,500
Grain Loaded	1,150,000 ton	25 ton	45,000	15	40	27.5	27.5	34,500
Synthetic Haul Out	20,000 ton	25 ton	800	15	40	27.5	27.5	616
Wet Haul Out	683,250 ton	25 ton	27,331	15	40	27.5	27.5	20,638
Fleet Totals			150,533			27.5		52,408

Fleet Averages (weighted)
 Annual Limited Amounts and Quantity Transported per Truck values are linked to Project Parameters tab.
 Corn Oil Haul Out annual amount trucked calculated based on 1 lb of corn oil per bushel of grain received.

Unmitigated Emission Factor, $E_f = k \cdot (w \cdot 0.91)^{-0.091}$ (Equation 1 from AP-42.13.2.1)

PM	PM10	PM2.5
k =	0.011	0.0022
w =	27.5	27.5
sl =	1.1	1.1

where k =
 W =
 sl =
 h/vMT = particle size multiplier (AP-42 Table 13.2.1-1)
 h/v = average vehicle weight (provided by sources)
 v/m² = silt loading value for paved roads at corn wet mills - Table 13.2.1-3.

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor, $E_{mf} = E_f \cdot [1 - (p/4N)]$ (Equation 2 from AP-42.13.2.1)

Mitigated Emission Factor, $E_{mf} =$
 where p =
 N =

days of rain greater than or equal to 0.01 inches (see Fig. 13.2.1-2)

PM	PM10	PM2.5
k =	0.353	0.071
w =	0.322	0.364
sl =	50%	50%

where k =
 W =
 sl =
 h/vMT = particle size multiplier (AP-42 Table 13.2.1-1)
 h/v = average vehicle weight (provided by sources)
 v/m² = silt loading value for paved roads at corn wet mills - Table 13.2.1-3.

Dust Control Efficiency = 50% (pursuant to control measures outlined in fugitive dust control plan)

Process	Unmitigated PTE of PM (tons/yr)	Unmitigated PTE of PM10 (tons/yr)	Unmitigated PTE of PM2.5 of PM (tons/yr)	Mitigated PTE of PM10 (tons/yr)	Mitigated PTE of PM2.5 of PM (tons/yr)	Controlled PTE of PM10 (tons/yr)	Controlled PTE of PM2.5 (tons/yr)
DDOGS Haul Out	1.70	0.34	0.08	1.56	0.31	0.78	0.16
Ethanol Haul Out	2.05	0.41	0.10	1.89	0.09	0.94	0.19
Denaturant Delivery	0.15	0.03	0.01	0.03	0.01	0.07	0.01
Grain Delivery	6.08	1.22	0.30	5.68	1.11	2.79	0.36
Synthetic Haul Out	0.11	0.22	0.01	0.02	0.05	0.01	0.00
Wet Haul Out	0.11	0.22	0.01	0.02	0.05	0.01	0.00
Total	16.23	3.25	0.80	14.85	0.73	3.10	0.45

Methodology
 Total weight driven per day (ton/day)
 Minimum one-way distance (mi/day)
 Maximum one-way distance (mi/day) / (5280 ft/mi)
 Average vehicle weight per day (ton/day) / SUM(Total weight driven per day (ton/day) / SUM(Maximum 1st per day (mi/day))
 Average Miles Per Trip (mi/trip)
 Unmitigated PTE (tons/yr)
 Mitigated PTE (tons/yr)
 Controlled PTE (tons/yr)

Abbreviations

PM10 = Particulate Matter (<10 um)
 PM2.5 = Particulate Matter (<2.5 um)
 PTE = Potential to Emit

**Attachment B: Emission Calculations
Greenhouse Gas Emissions**

Company Name: **POET Biorefining - North Manchester, LLC**
 Address City IN Zip: **868 East 800 North, North Manchester, Indiana 46962**
 Significant Source Modification No.:
 Significant Permit Modification No.:
 Reviewer:

Conversion Factors:

1 lb/MMBtu =	1026	Btu/scf
1 ton =	2000	lb
1 year =	8760	hours

Assumptions:

Generator Operating Time = 500 hr/year

Combustion Emission Factors		
	Natural Gas ¹	Diesel ²
	lb/MMBtu	lb/MMBtu
CO2	116.98	163.1
CH4	0.9022	0.007
N2O	0.0002	0.001

Global Warming Potential Factor	
CO2	1
CH4	25
N2O	298

¹Greenhouse gas emission factors are taken from 40 CFR Part 98, Subpart C, Table C-1.

²Greenhouse gas emission factors are taken from 40 CFR Part 98, Subpart C, Table C-1 for distillate fuel oil no. 2.

1. Green House Gas from Natural Gas Combustion

	MMBtu/hr	MMCF/yr ¹	CO2 tons/yr	CH4 tons/yr	N2O tons/yr	CO2e tons/yr
Boiler #1	145.0	1,238	74,292	1.40	0.14	74,368
Boiler #2	145.0	1,238	74,292	1.40	0.14	74,368
Dryer #1	60	512	30,741	0.58	0.06	30,773
Dryer #2	60	512	30,741	0.58	0.06	30,773
RTO	30	256	15,371	0.29	0.03	15,387
Flare	0.054	0.461	27.67	5.21E-04	5.21E-05	28
Potential Emission (tons/yr)	440.1	3,757	225,464	4.2	0.4	225,697

2. Green House Gas from Diesel Combustion

	kW	MMBtu/yr	CO2 tons/yr	CH4 tons/yr	N2O tons/yr	CO2e tons/yr
Diesel Generator	2250	161885	13,198	5.35E-01	1.07E-01	13,243

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

¹Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu

Greenhouse Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).

3. Green House Gas from Fermentation (Biogenic)

Fermentation Process

Given: 115,000,000 gallons of undenatured (200-proof) EIOH / year
 46.06844 [g/mol] mole weight of EIOH
 0.789 [g/cm³] density of liquid EIOH
 44.0095 [g/mol] mole weight of CO2

and: C₆H₁₂O₆ + yeast = 2 CH₃CH₂OH + 2 CO₂
 sugar + yeast = ethanol + carbon dioxide

Therefore:	115,000,000 gal 200-proof EIOH	0.789 g EIOH	3,785.41 cm ³
	year	1 cm ³	1 gal
=	3.43E+11 g EIOH	1 mol EIOH	
	year	46.06844 g EIOH	
=	7,455,628,546 mol EIOH	2 mol CO ₂	
	year	2 mol EIOH	
=	7,455,628,546 mol CO ₂	44.0095 g CO ₂	1 ton
	year	1 mol CO ₂	907,184.74 g
=	361,689 tons CO ₂ / year		
Biogenic GHG=	361,689 CO2e Total in tons/yr		

Total GHG Emissions (Combustion and Biogenic)			
CO2	CH4	N2O	CO2e
tons/yr	tons/yr	tons/yr	tons/yr
600,350.52	4.78	0.53	600,628.66

Attachment B: Emission Calculations
326 IAC 6-3-2 Particulate Emission Limitations for Manufacturing Processes

Company Name: POET Biorefining - North Manchester, LLC
Address City IN Zip: 868 East 800 North, North Manchester, Indiana 46962
Significant Source Modification No.:
Significant Permit Modification No.:
Reviewer:

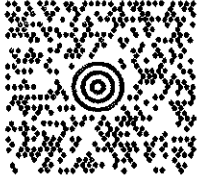
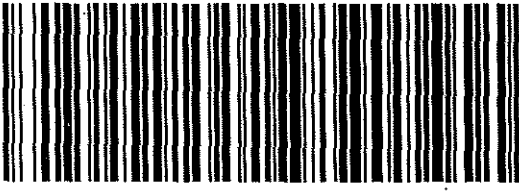

PM Control Device	Process	Process Weight, P		P ≤ 60,000 lb/hr	P > 60,000 lb/hr	PTE	PTE
		each unit	each unit	E = 4.10 P ^{0.67}	E = 55 P ^{0.11} - 40	Uncontrolled	Controlled
		P (lb/hr)	P (ton/hr)	E (lb/hr)	E (lb/hr)	(lb/hr)	(lb/hr)
CE001	Grain Receiving (EU001), Conveyors (EU002), and Grain Storage Bins (EU003)	1,680,000	840	-	75.4	136.11	1.36
CE018	Belt Conveyors EU002b and Grain Bins EU003b	1,680,000	840	-	75.4	5.14	0.05
CE019	Belt Conveyors EU002b and Grain Bins EU003b	1,680,000	840	-	75.4	5.14	0.05
CE002	Corn Transfer Conveyor / Scalper (EU004, Surge Bin (EU005)	280,000	140	-	54.7	10.29	0.10
CE003	Hammermill #1 (EU006)	90,000	45	-	43.6	41.14	0.41
CE004	Hammermill #2 (EU007)	90,000	45	-	43.6	41.14	0.41
CE005	Hammermill #3 (EU008)	90,000	45	-	43.6	41.14	0.41
CE006	Hammermill #4 (EU009)	90,000	45	-	43.6	41.14	0.41
CE007	Hammermill #5 (EU010)	90,000	45	-	43.6	41.14	0.41
CE009	DDGS Dryer (EU025)	73,516	36.8	-	41.8	109.88	10.99
CE009	DDGS Dryer (EU026)	73,516	36.8	-	41.8	109.88	10.99
CE010	Fluidized DDGS Cooler (EU029)	73,516	36.8	-	41.8	81.60	0.816
CE011	DDGS Silo Loading (EU030)	73,516	36.8	-	41.8	0.56	0.14
CE012	DDGS Silo Bypass (EU031)	73,516	36.8	-	41.8	0.60	0.15
CE016	DDGS conveyor (EU033)	440,000	220	-	59.5	21.66	0.00
	DDGS rail or truck loadout spout (EU035)	440,000	220	-	59.5	0.00	0.00

(c) This rule shall not apply if a particulate matter limitation established in:

- (1) 326 IAC 2-2-3, concerning prevention of significant deterioration (PSD) best available control technology (BACT) determinations contained in a permit;
- (2) 326 IAC 2-3-3, concerning lowest achievable emission rate (LAER) determinations contained in a permit;
- (3) 326 IAC 6.5 and 326 IAC 6.8, concerning particulate matter emissions;
- (4) 326 IAC 11, concerning existing emission limitations for specific operations;
- (5) 326 IAC 12, concerning new source performance standards; or
- (6) 326 IAC 20, concerning national emission standards for hazardous air pollutants.

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POET 605-965-2200 4615 N LEWIS AVE SIOUX FALLS SD 57104	1 LBS	1 OF 1
SHIP TO: ATTN: INCOMING APPLICATION INDIANA DEPARTMENT OF ENV MGMNT IGCN 1003 100 NORTH SENATE AVENUE OFFICE OF AIR QUALITY INDIANAPOLIS IN 46204		
	IN 461 9-01	
		
UPS GROUND		
TRACKING #: 1Z 308 TT1 03 9985 2690		
		
BILLING: P/P		
Reference #1: ppm		 TM
<small>XOL 24.06.20 NV45 26.0A 06/2024*</small>		

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 Office of Air Quality